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Student Access to Digital Learning Resources Outside of the Classroom

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Executive Summary

Educators, policymakers, and parents alike are focused on ensuring the academic success of our nation's students. These efforts interact with the expanding use of technology, which affects the lives of students both inside and outside of the classroom. Thus, the role that technology plays in education is an evolving area of research that continues to grow in importance. While access to technology can provide valuable learning opportunities to students, it does not guarantee successful outcomes. Designing successful practices for student use of technology is but one piece of the puzzle in the continued effort to elevate the educational experiences of all students. Schools, teachers, communities, and families play a critical role in successfully integrating technology into teaching, learning, and assessment.

Recent legislation acknowledges the growing role that technology plays in students' daily lives. The Every Student Succeeds Act (ESSA) provides guidance to state governments on how to receive supplemental federal funding for public education. As part of the ESSA legislation, the Institute of Education Sciences (IES) is required to produce a report on the educational impact of access to digital learning resources (DLR) outside of the classroom. Specifically, ESSA requests that IES conduct the following research:

1. An analysis of student habits related to DLR outside of the classroom, including the location and types of devices and technologies that students use for educational purposes;
2. An identification of the barriers students face in accessing DLR outside of the classroom;
3. A description of the challenges that students who lack home internet access face, including challenges related to student participation and engagement in the classroom and homework completion;
4. An analysis of how the barriers and challenges such students face impact the instructional practices of educators; and
5. A description of the ways in which state education agencies, local education agencies, schools, and other entities, including partnerships of such entities, have developed effective means to address the barriers and challenges students face in accessing DLR outside of the classroom.

This report, produced by the IES' National Center for Education Statistics (NCES), responds to the ESSA mandate for an analysis of the educational impact of access to DLR outside of the classroom.

Digital Learning Resources

As defined in ESSA (2015), the term "digital learning" refers to "any instructional practice that effectively uses technology to strengthen a student's learning experience and encompasses a wide spectrum of tools and practices" (p. 1969). This includes:

> (a) interactive learning resources, digital learning content (which may include openly licensed content), software, or simulations, that engage students in academic content; (b) access to online databases and other primary source documents; (c) the use of data and information to personalize learning and provide targeted supplementary instruction; (d) online and computer-based assessments; (e) learning environments that allow for rich collaboration and communication, which may include student collaboration with content experts and peers; (f) hybrid or blended learning, which occurs under direct instructor supervision at a school or other location away from home and, at least in part, through online delivery of instruction with some element of student control over time, place, path, or pace; and (g) access to online course opportunities for students in rural or remote areas. (p. 1969)

As described above, a variety of technological tools and practices can fall under the category of "digital learning resources." For the purpose of this report, DLR refers to computers (i.e., laptops, desktops, and notebooks), mobile devices (i.e., smart phones and tablets), and broadband internet.[1] This report assumes that students primarily engage in digital learning through these resources.

[1] In 2010, the Federal Communications Commission (FCC) defined "broadband" as internet access with speeds of 4 Mbps for downloads and 1 Mbps for uploads (FCC 2015). Over time, the number of users per household increased, and subsequently in 2015 the FCC changed the definition of broadband to speeds of at least 25 Mbps for downloads and 3 Mbps for uploads. The terms "broadband" and "high-speed" are used interchangeably in this report.

Report Overview and Methods

This report draws upon the most recently available nationally representative data sources, existing research, and relevant state and local intervention efforts to examine the five research areas identified in ESSA, and to provide an overview of student access to DLR outside of the classroom. To address research areas 1 and 2, nationally and internationally representative survey data collected by NCES, the Census Bureau, and other organizations are analyzed in the form of brief indicators describing student access to DLR outside of the classroom. The statistical sources for the report generally consist of surveys with the most recent data (i.e., from 2015), due to the rapidly changing nature of DLR.

Student Access to Digital Learning Resources Outside of the Classroom focuses primarily on children between the ages of 3 and 18. Most indicators in the report summarize data from sample surveys conducted by NCES or household surveys conducted by the Census Bureau such as the American Community Survey (ACS) and Current Population Survey (CPS). Due to differences in the survey populations and the indicator topics of interest, the report indicators reference either children in a specific age range or students in a specific age range or grade level. Each indicator specifies which population is being discussed in its text and figures.

The summary of existing research and relevant state and local intervention efforts described in this report address topics for which limited or no recent nationally representative statistical data sources are available (i.e., research areas 3, 4 and 5). For research area 3, a summary of existing research, combined with a set of indicators drawing data from national and international surveys, describes the challenges faced by students who lack home access to the Internet and DLR. The summary of existing research is limited to empirical studies published in peer-reviewed journals and government reports from 2005 to 2016, so as to best describe the current state of DLR access outside of the classroom. The state and local intervention efforts cited in this report focus on those conducted in 2015 and 2016 (2015 being the most recent data year reported in the indicators and 2016 being the year before the report was in production).

The sections of this report are aligned to the research areas identified in the ESSA legislation. Below is a summary of findings from each of the report sections based on analyses of national data sources and reviews of current literature.

Student Use of Digital Learning Resources Outside of the Classroom

Section 1 of this report presents nine indicators based on the most recently available analyses of nationally and internationally representative survey data that provide an overview of students' use of DLR outside of the classroom. Results revealed that 94 percent of children ages 3 to 18 had a computer at home and 61 percent of children ages 3 to 18 had internet access at home in 2015 (*Indicators 1* and *2*). The percentages of children with computer and internet access at home in 2015 were higher for children who were older, those whose parents had higher levels of educational attainment, and those whose families had higher incomes. Also, higher percentages of children who were White (66 percent), Asian (63 percent), and of Two or more races (64 percent) had home internet access in 2015 than did Black (53 percent), Hispanic (52 percent), and American Indian/Alaska Native children (49 percent).

Location and Means of Internet Access

For those children who had access to the Internet in 2015, the two locations with the highest reported levels of internet access were at home (86 percent) and at school (65 percent), and the two most common means of internet access at home were a high-speed internet service and a mobile internet service or data plan (*Indicators 3* and *4*). In 2015, about 78 percent of children ages 3 to 18 who used the Internet at home accessed it through a high-speed internet service installed at home; this percentage was lower than the corresponding percentage in 2010 (89 percent). In contrast, a higher percentage of children who used the Internet at home accessed it through a mobile internet service or data plan in 2015 (67 percent) than in 2010 (9 percent).

Computer Use at Home and for Schoolwork

In 2015, about 88 percent of 8th-graders and 83 percent of 4th-graders reported that they used a computer at home, and 80 percent of 8th-graders reported using a computer for schoolwork on a weekday (*Indicators 5* and *6*). Also, about 20 percent of 8th-grade public school students reported not using a computer for schoolwork on a weekday, 29 percent reported using a computer for less than 1 hour, 29 percent reported using a computer for 1 to 2 hours, 11 percent reported using a computer for 2 to 3 hours, and 11 percent reported using a computer for more than 3 hours.

Home Computer and Internet Access Across States and Countries

In 2015, about 87 percent of U.S. households owned or used a computer at home, and 77 percent of U.S. households had access to the Internet. The percentages of households with computer and internet access varied by state. For example, in 2015 the percentage of households with computer access ranged from 79 percent in Mississippi to 93 percent in Utah, and the percentage of households with internet access ranged from 62 percent in Mississippi to 85 percent each in New Hampshire and Washington (*Indicator 7*). When comparing the United States with other countries, the United States had higher percentages of students with computer and internet access at home in 2015 than the average of countries participating in the Trends in International Mathematics and Science Study (*Indicator 8*). Also, in 2012 the United States had a higher percentage of 16- to 19-year-olds using spreadsheet or word processing software every day than the average of countries in the Organization for Economic Cooperation and Development (OECD) (*Indicator 9*).

Barriers in Student Access to Digital Learning Resources Outside of the Classroom

Section 2 presents five indicators that provide an overview of potential barriers to students' access to the Internet and computers at home. In 2015, the two main reasons children ages 3 to 18 lacked access to the Internet at home were that access was too expensive and that their family did not need it or was not interested in having it (38 percent each; *Indicator 10*). Internet access being too expensive was more commonly the main barrier for children from low-income families and for children whose parents had low levels of educational attainment than for other children.

Student Internet Access by Locale, Race/Ethnicity, and Poverty

In addition, 5- to 17-year-old students' access to fixed broadband service[2] at home differed by geographic locale (*Indicators 11* and *12*). A higher percentage of students in suburban areas had fixed broadband access at home than students in rural areas, with the largest difference noted for students in remote rural areas. For example, the percentage of students in remote rural (65 percent) and distant rural areas (66 percent) with fixed broadband access was lower than in other locales, with percentages ranging from 70 percent in distant towns to 85 percent in large suburbs. In contrast, the percentage of students with either no internet access or only dial-up access at home was higher for those living in remote rural areas (18 percent) than for those living in all other detailed locale types, with the percentages ranging from 7 percent in large suburbs to 16 percent in distant rural areas.

Within locale types, there were additional gaps among students of different poverty levels and racial/ethnic groups. For example, in remote rural areas the percentages of students who had either no internet access or only dial-up access at home were higher for Black (41 percent) and Hispanic students (26 percent) than for White (13 percent) and Asian students (11 percent).

This section also shows that a lower percentage of students eligible for free or reduced-price lunch reported that they had a digital device in their home, or that they first used a computer prior to first grade, than their peers who were not eligible for free or reduced-price lunch (*Indicators 13* and *14*).

Challenges Faced by Students Who Lack Access to Digital Learning Resources Outside of the Classroom

Section 3 presents both a summary of prior research and eight indicators that explore the challenges faced by students who lack access to DLR outside of the classroom. There is less research on relationships between students' access to DLR at home and their participation and engagement in the classroom than on other topics more narrowly focused on classroom activities. However, some studies explored relationships between student computer access at home and academic outcomes, with mixed findings. While some studies of home computer access revealed positive correlations with academic performance (Jackson et al. 2006; Beltran, Das, and Fairlie 2010; Espinosa et al. 2006; Fish et al. 2008), others found no relationship or negative relationships between home computer access and student achievement (Fairlie and Robinson 2013; Hunley et al. 2005; Vigdor, Ladd, and Martinez 2014). In addition, research on the impact of instructional computer use in schools on academic performance, including some randomized control trials and several quasi-experimental studies, found mixed results (Campuzano et al. 2009; Dynarski et al. 2007; Goolsbee and Guryan 2006; Shannon et al. 2015; Suhr et al. 2010; Chambers et al. 2011).

[2] Fixed broadband (of any sort) excludes mobile broadband, but includes all other non-dial-up internet service, such as DSL, cable modem, fiber-optic cable, and satellite internet service.

The indicators in Section 3 show higher average achievement scores for students who used computers at home and/or had internet access at home than for those who did not (*Indicators 15–21*). However, these analyses do not systematically take into account multiple socioeconomic background characteristics that are known to affect student achievement. The design of these surveys combined with the lack of comprehensive socioeconomic metrics limits their use on this topic to primarily descriptive indicators.

Comparisons of Academic Scores by Computer Use and Internet Access at Home

These descriptive indicators showed a consistent pattern of higher performance scores for students with home internet access in reading, mathematics, and science (*Indicators 15, 16, 17, 19, 20,* and *21*), and for students' knowledge of information and communication technology (*Indicator 18*), than for their peers without home internet access. Achievement gaps between those who reported using a computer at home/having access to the Internet at home and those who did not could be influenced by other factors, including socioeconomic background characteristics such as parents' educational attainment and family income. Associations between socioeconomic characteristics and DLR access are presented in Section 1 of this report. For example, in 2015 the average National Assessment of Educational Progress (NAEP) reading scale score was higher for 8th-grade students who used a computer at home (268) than for those who did not use a computer at home (247). Similarly, the average reading scale score was higher for 8th-grade students who had access to the Internet at home (267) than for those who did not have access to the Internet at home (242). The size of the achievement gaps between those who reported using a computer at home/having access to the Internet at home and those who did not varied by student and family characteristics. For an international reference point, *Indicator 22* shows that a higher percentage of U.S. 16- to 19-year-olds performed at the lowest proficiency level in problem solving in technology-rich environments than the OECD average.

Impact of Access to Digital Learning Resources Outside of the Classroom on Instructional Practices of Educators

Section 4 presents a summary of prior research. Student access to DLR outside of the classroom may impact the instructional practices of educators. However, based on the results of the literature search of empirical studies published in peer-reviewed journals and government reports from 2005 to 2016, existing research on potential impacts is lacking. Thus, the included studies and their results may not be representative. The handful of relevant studies present limited evidence regarding the relationship between teachers' knowledge of student access to and experience with DLR outside the classroom and instructional practices. For example, a study conducted with 36 elementary and secondary school teachers who created course websites found that contextual barriers, including teacher perceptions that students could not access the Internet from home, resulted in the majority of teachers not using such websites on a regular basis (Friedman 2006).

Other research found that teachers tended to underestimate student access to DLR outside of the classroom because the teachers tended to focus primarily on access to computers and did not take into account student experience with other digital technologies, such as video game consoles (Henderson 2011; Honan 2008). Based on these perceptions, the author concluded that teachers tended to focus their lessons on familiarizing students with operating computers (Honan 2008).

As student access to DLR outside of the classroom increases over time, educators may need to adapt instructional practices in an effort to incorporate home-based technology into teaching and learning. A larger body of research is available on the challenges and barriers teachers and schools face in adapting instructional practices to further develop students' digital literacy skills for use of DLR both inside and outside of the classroom. Reviews of prior research suggest that individual, school, and technical factors are associated with teachers' use of information and communication technology in the classroom (Buabeng-Andoh 2012; Fu 2013). Conclusions from the literature review suggest that at the individual level, teachers are less likely to use technology in the classroom if they lack the confidence, skills, and pedagogical training to do so; if they do not perceive a benefit of using a new technology over current instructional approaches; or if they anticipate the new approach will be difficult or time-intensive to adopt. At the school level, technology experiences may be limited by organizational structures, such as an emphasis on traditional assessment and instructional methods or on restrictive curricula. Technical-level barriers include the absence of current and well-maintained hardware or appropriate instructional software, and limited access to technology resources in the school.

Interventions at State and Local Levels

State and local interventions to increase access to DLR and the Internet both inside and outside of the classroom are underway across the United States. Section 5 describes a few examples of such interventions being conducted in 2015 and 2016 (2015 being the most recent data collection year reported and 2016 being the year before the report was in production). Organizations such as EducationSuperHighway, the State Educational Technology Directors Association, and other local-level initiatives help bring DLR access to students and their families both inside and outside of the classroom at lower costs. Lowering the family cost for internet access could mitigate some of the cost barriers identified in Section 2. For example, some districts are installing wireless routers on buses or providing mobile Wi-Fi hotspots so that students can access the Internet outside of the classroom. Other local-level strategies to increase student internet access to DLR outside the classroom include providing funding for internet access programs and providing devices directly to students to help bridge the digital divide.

Summary

The findings from this report highlight the generally wide home-based access to the Internet for the nation's children. However, gaps in internet access do remain between different groups of children. In particular, 5- to 17-year-old students living below the poverty threshold have lower rates of home internet access than students living between 100 and 185 percent of the poverty threshold and students living at greater than 185 percent of the poverty threshold. Also, American Indian/Alaska Native, Black, and Hispanic students have lower rates of home internet access than their peers who are White, Asian, and of Two or more races.

The geographic locale in which a student's home is situated also plays an important role in home-based internet access. Students living in households in remote rural and distant rural areas generally had more limited access to the Internet than students in suburbs, cities, or towns, with the exception of remote towns. For 5- to 17-year-old students living in households in remote rural areas, the percentage without internet access at home was particularly high. For instance, in remote rural areas 41 percent of Black students and 35 percent of students living in poverty had either no internet access or only had dial-up access at home. Students without home internet access had lower assessment scores in reading, mathematics, and science across a range of national and international assessments. International comparisons against advanced countries showed that the United States had a higher-than-average percentage of 16- to 19-year-olds with the lowest level of computer literacy skills.

Future Directions

The purpose of this report is to present findings regarding student habits with DLR, the challenges and barriers faced by students who lack access to DLR outside of the classroom, how these challenges and barriers impact both students and teachers and their instructional practices, and what steps have been taken by state and local entities to address these challenges and barriers. The research for this report highlighted some areas that could benefit from additional attention or enhanced data collections:

- **Purpose of DLR:** Data on how many students have access to DLR and what types of students tend to have access, both inside and outside of the classroom, are readily available. However, prior research has shown that having access to DLR does not uniformly improve students' learning experiences. As such, the field would benefit from more knowledge of how students use different types of DLR both inside and outside of the classroom, with a particular focus on how they are used for educational purposes.
- **Impact on Students:** More studies could explore how students' access to DLR outside of the classroom impacts their participation, engagement, and achievement inside the classroom. Additional data could also be collected on the frequency and nature of DLR use outside of the classroom and its relationship to academic outcomes, since some prior research shows that moderate internet use was associated with higher academic scores than frequent or rare internet use.
- **Impact on Teachers:** Student access to DLR outside of the classroom may impact the instructional practices of educators. However, existing research on potential relationships is limited. A larger body of research is available on the challenges and barriers teachers and schools face in adapting instructional practices to

classroom situations than to developing students' digital literacy skills outside of the classroom. The available research on teachers' perceptions of disparities in student and parent internet access at home suggests that these perceptions may impact their instructional decisions, but more research is needed in this area.

Valuable studies of these relationships could be conducted at the local, state, or national level. The education research community could play an important role in improving our understanding of the interactions of home and school use of the Internet, and assisting in the development of effective instructional practices. Education researchers could also take steps to improve the potential for more detailed research on the use of technology. For example, longitudinal studies could be designed to collect nationally representative data about students, parents, teachers, and schools. Future longitudinal studies could collect information from parents about home internet use that could then be examined in terms of their potential relation to academic outcomes. National and state longitudinal studies frequently include socioeconomic variables that also would be key components of effective analyses of potential relationships between the use of DLR and educational outcomes, with respect to equity. The availability of assessment points at multiple intervals could enable researchers to examine both change over time in access to DLR, as well as the interaction that these changes may have with educational outcomes. Further research will also need to be sensitive to the ongoing concerns about internet safety and security, as well as the appropriate scope of digital activities for children.

This report addresses questions related to the scope of technology use at home and provides some information on the relationship between technology and student outcomes. However, answering questions related to how technology is used for education purposes outside of school and for what purposes remains challenging, and is thus an important area for continued research.

Reader's Guide

Student Access to Digital Learning Resources Outside of the Classroom draws upon relevant data sources, existing research, and relevant state and local intervention efforts to examine the five research areas identified in the Every Student Succeeds Act (ESSA) and to provide a comprehensive picture of student access to digital learning resources (DLR) outside of the classroom. This report is available on the National Center for Education Statistics (NCES) website as a full PDF and in HTML. The reference tables can be found in Appendix C: Reference Tables.

Data Sources, Estimates, and Literature Search

The data, presented in the form of brief indicators, were obtained from many different sources—including students, parents, and teachers; state education agencies; and local elementary and secondary schools—using surveys. Users should be cautious when comparing data from different sources. Differences in aspects such as procedures, timing, question phrasing, and interviewer training can affect the comparability of results across data sources.

Most indicators in this report summarize data from surveys conducted by NCES or by the Census Bureau with support from NCES. Brief descriptions of the major NCES surveys used in these indicators can be found in the Appendix A: Guide to Data Sources for Indicators. More detailed descriptions can be obtained on the NCES website under "Surveys and Programs."

The Guide to Data Sources for Indicators also includes information on non-NCES sources used to develop indicators, such as the Census Bureau's American Community Survey (ACS) and Current Population Survey (CPS). For further details on the ACS, see https://www.census.gov/programs-surveys/acs/. For further details on the CPS, see https://www.census.gov/programs-surveys/cps.html.

Data for indicators in this report are obtained from sample surveys, which collect data from a sample of the population of interest. For example, the National Assessment of Educational Progress (NAEP) assesses a representative sample of students rather than the entire population of students. When a sample survey is used, statistical uncertainty is introduced, because the data come from only a portion of the entire population. This statistical uncertainty must be considered when reporting estimates and making comparisons. For more information, please see the section on standard errors below.

Various types of statistics derived from sample surveys are presented in this report. Many indicators report the size of a population or a subpopulation, and often the size of a subpopulation is expressed as a percentage of the total population. In addition, the average (or *mean*) value of some characteristic of the population or subpopulation may be reported. The average is obtained by summing the values for all members of the population and dividing the sum by the size of the population.

The summary of existing research is limited to empirical studies published in peer-reviewed journals and government reports from 2005 to 2016, so as to best describe the current state of DLR access outside of the classroom. Relevant journal articles and reports published during this period were located by searching online databases and checking reference lists. The databases used included Education Resources Information Center (ERIC), Education Research Complete via EBSCO, and Google Scholar. Keywords for the search included terms such as "home internet access," "home computer access," and "information communication technologies (ICTs)," as well as related derivations such as "home internet," "home computer," etc. When a relevant journal article was identified, a review of other literature that had cited that article was also conducted. All articles that were located through this search process that examined the topic of interest were included in the findings described below. No further evaluation of study quality was undertaken.

In Section 5, this report focuses on efforts conducted in 2015 and 2016 (2015 being the most recent data year reported in the indicators and 2016 being the year before the report was in production). For this section, we had limited ability to address the Congressional mandate within the timeframe and scope of this report. We searched for relevant reports on technology, but did not identify any national data or evaluations addressing systematic efforts to address DLR access at home. We did identify some reports published by political

organizations and advocacy groups, and provided some examples of state and local efforts from those reports. It is important to understand that these examples are not representative of all the types of efforts that are currently being made. It is likely that there are other examples of state and local initiatives that are not discussed here because reports were not produced about these efforts within the time frame that we used for our search procedures.

Standard Errors

Using estimates calculated from data based on a sample of the population requires consideration of several factors before the estimates become meaningful. When using data from a sample, some *margin of error* will always be present in estimations of characteristics of the total population or subpopulation because the data are available from only a portion of the total population. Consequently, data from samples can provide only an approximation of the true or actual value. The margin of error of an estimate, or the range of potential true or actual values, depends on several factors such as the amount of variation in the responses, the size and representativeness of the sample, and the size of the subgroup for which the estimate is computed. The magnitude of this margin of error is measured by what statisticians call the "standard error" of an estimate. Larger standard errors typically mean that the estimate is less accurate, while smaller standard errors typically indicate that the estimate is more accurate.

When data from sample surveys are reported, the standard error is calculated for each estimate. The standard errors for all estimated totals, means, medians, or percentages are reported in the reference tables.

In order to caution the reader when interpreting findings in the indicators, estimates from sample surveys are flagged with a "!" when the standard error is between 30 and 50 percent of the estimate, and suppressed with a "‡" when the standard error is 50 percent of the estimate or greater.

Data Analysis and Interpretation

When estimates are from a sample, caution is warranted when drawing conclusions about whether one estimate is different in comparison to another; about whether a time series of estimates is increasing, decreasing, or staying the same; or about whether two variables are associated. Although one estimate may appear to be larger than another, a statistical test may find that the apparent difference between them is not measurable due to the uncertainty around the estimates. In this case, the estimates will be described as having *no measurable difference*, meaning that the difference between them is not statistically significant.

Whether differences in means or percentages are statistically significant can be determined using the standard errors of the estimates. In the indicators in this report and other reports produced by NCES, when differences are statistically significant, the probability that the difference occurred by chance is less than 5 percent, according to NCES standards.

For all indicators that report estimates based on samples, differences between estimates (including increases and decreases) are stated only when they are statistically significant. To determine whether differences reported are statistically significant, two-tailed *t* tests at the .05 level are typically used. The *t* test formula for determining statistical significance is adjusted when the samples being compared are dependent. The *t* test formula is not adjusted for multiple comparisons, with the exception of statistical tests conducted using the NAEP Data Explorer. When the variables to be tested are postulated to form a trend over time, the relationship may be tested using linear regression or ANOVA trend analyses instead of a series of *t* tests. Indicators that use other methods of statistical comparison include a separate technical notes section. For more information on data analysis, please see the NCES Statistical Standards, Standard 5-1, available at http://nces.ed.gov/statprog/2012/pdf/Chapter5.pdf.

Data presented in the indicators do not investigate complex hypotheses or support causal inferences. This report uses descriptive statistics to explore differences in students' access to and use of DLR at home by individual, family, and neighborhood characteristics, as well as associations between DLR access/use and academic outcomes. One of the limitations of bivariate statistics is that they describe subpopulation differences without taking into account the influence of other individual, family, school, or environmental factors. Many of the variables examined in this report may be related to other factors outside of students' access to and use of computers and the Internet in their homes. Future research using more complex methods, such as

multivariate analyses, can further explore variations in student access to and use of DLR; it can also examine relationships between access and academic outcomes after taking into account other characteristics of students, families, and schools that are interrelated. We encourage readers who are interested in more complex questions and in-depth analysis to explore other NCES resources, including publications, online data tools, and public- and restricted-use datasets at http://nces.ed.gov.

A number of considerations influence the ultimate selection of the data years to feature in the indicators. To make analyses as timely as possible, the latest year of available data is shown. The choice of comparison years is often also based on the need to show the earliest available survey year. In the figures and tables of the indicators, intervening years are selected in increments in order to show the general trend. The narrative for the indicators typically compares the most current year's data with those from the initial year. Where applicable, the narrative may also note years in which the data begin to diverge from previous trends.

Rounding and Other Considerations

All calculations within the indicators in this report are based on unrounded estimates. Therefore, the reader may find that a calculation, such as a difference or a percentage change, cited in the text or figure may not be identical to the calculation obtained by using the rounded values shown in the accompanying tables. Although values reported in the reference tables are generally rounded to one decimal place (e.g., 76.5 percent), values reported in each indicator are generally rounded to whole numbers (with any value of 0.50 or above rounded to the next highest whole number). Due to rounding, cumulative percentages may sometimes equal 99 or 101 percent rather than 100 percent. While the data labels on the figures have been rounded to whole numbers, the graphical presentation of these data is based on the unrounded estimates.

Race and Ethnicity

The Office of Management and Budget (OMB) is responsible for the standards that govern the categories used to collect and present federal data on race and ethnicity. The OMB revised the guidelines on racial/ethnic categories used by the federal government in October 1997, with a January 2003 deadline for implementation. The revised standards require a minimum of these five categories for data on race: American Indian or Alaska Native, Asian, Black or African American, Native Hawaiian or Other Pacific Islander, and White. The standards also require the collection of data on ethnicity categories, at a minimum, Hispanic or Latino and Not Hispanic or Latino. It is important to note that Hispanic origin is an ethnicity rather than a race, and therefore persons of Hispanic origin may be of any race. Origin can be viewed as the heritage, nationality group, lineage, or country of birth of the person or the person's parents or ancestors before their arrival in the United States. The race categories White, Black, Asian, Native Hawaiian or Other Pacific Islander, and American Indian or Alaska Native, as presented in these indicators, exclude persons of Hispanic origin unless noted otherwise.

The categories are defined as follows:

- **American Indian or Alaska Native:** A person having origins in any of the original peoples of North and South America (including Central America) and maintaining tribal affiliation or community attachment.
- **Asian:** A person having origins in any of the original peoples of the Far East, Southeast Asia, or the Indian subcontinent, including, for example, Cambodia, China, India, Japan, Korea, Malaysia, Pakistan, the Philippine Islands, Thailand, and Vietnam.
- **Black or African American:** A person having origins in any of the black racial groups of Africa.
- **Native Hawaiian or Other Pacific Islander:** A person having origins in any of the original peoples of Hawaii, Guam, Samoa, or other Pacific Islands.
- **White:** A person having origins in any of the original peoples of Europe, the Middle East, or North Africa.
- **Hispanic or Latino:** A person of Mexican, Puerto Rican, Cuban, South or Central American, or other Spanish culture or origin, regardless of race.

Within these indicators, some of the category labels have been shortened in the text, tables, and figures for ease of reference. American Indian or Alaska Native is denoted as American Indian/Alaska Native (except when separate

estimates are available for American Indians alone or Alaska Natives alone); Black or African American is shortened to Black; and Hispanic or Latino is shortened to Hispanic. Native Hawaiian or Other Pacific Islander is shortened to Pacific Islander.

The indicators in this report draw from a number of different data sources. Many are federal surveys that collect data using the OMB standards for racial/ethnic classification described above; however, some sources have not fully adopted the standards, and some indicators include data collected prior to the adoption of the OMB standards. This report focuses on the six categories that are the most common among the various data sources used: White, Black, Hispanic, Asian, Pacific Islander, and American Indian/Alaska Native. Asians and Pacific Islanders are combined into one category in indicators for which the data were not collected separately for the two groups.

Some of the surveys from which data are presented in these indicators give respondents the option of selecting either an "other" race category, a "Two or more races" or "multiracial" category, or both. Where possible, indicators present data on the "Two or more races" category; however, in some cases this category may not be separately shown because the information was not collected or due to other data issues. In general, the "other" category is not separately shown. Any comparisons made between persons of one racial/ethnic group to "all other racial/ethnic groups" include only the racial/ethnic groups shown in the indicator. In some surveys, respondents are not given the option to select more than one race. In these surveys, respondents of Two or more races must select a single race category. Any comparisons between data from surveys that give the option to select more than one race and surveys that do not offer such an option should take into account the fact that there is a potential for bias if members of one racial group are more likely than members of the others to identify themselves as "Two or more races."[1]

For more information on race/ethnicity, see Appendix B: Definitions.

[1] Such bias was found by a National Center for Health Statistics study that examined race/ethnicity responses to the 2000 Census. This study found, for example, that as the percentage of multiple-race respondents in a county increased, the likelihood of respondents stating Black as their primary race increased among Black/White respondents but decreased among American Indian or Alaska Native/Black respondents.

Locale

Federal departments and agencies use various classification systems to define community types.

Indicators in *Student Access to Digital Learning Resources Outside of the Classroom* use the National Center for Education Statistics (NCES) system of locale codes. These locale codes are based on an address's proximity to an urbanized area.

- **City, Large:** Territory inside an urbanized area and inside a principal city with population of 250,000 or more.
- **City, Midsize:** Territory inside an urbanized area and inside a principal city with population less than 250,000 and greater than or equal to 100,000.
- **City, Small:** Territory inside an urbanized area and inside a principal city with population less than 100,000.
- **Suburb, Large:** Territory outside a principal city and inside an urbanized area with population of 250,000 or more.
- **Suburb, Midsize:** Territory outside a principal city and inside an urbanized area with population less than 250,000 and greater than or equal to 100,000.
- **Suburb, Small:** Territory outside a principal city and inside an urbanized area with population less than 100,000.
- **Town, Fringe:** Territory inside an urban cluster that is less than or equal to 10 miles from an urbanized area.
- **Town, Distant:** Territory inside an urban cluster that is more than 10 miles and less than or equal to 35 miles from an urbanized area.
- **Town, Remote:** Territory inside an urban cluster that is more than 35 miles from an urbanized area.
- **Rural, Fringe:** Census-defined rural territory that is less than or equal to 5 miles from an urbanized area, as well as rural territory that is less than or equal to 2.5 miles from an urban cluster.
- **Rural, Distant:** Census-defined rural territory that is more than 5 miles but less than or equal to 25 miles from an urbanized area, as well as rural territory that is more than 2.5 miles but less than or equal to 10 miles from an urban cluster.

- **Rural, Remote:** Census-defined rural territory that is more than 25 miles from an urbanized area and is also more than 10 miles from an urban cluster.

Metropolitan Status

Metropolitan areas refer to metropolitan statistical areas which contain at least one urbanized area with a population of 50,000 or more. Nonmetropolitan areas refer to areas that are outside of metropolitan statistical areas.

Poverty and Income

In indicators using U.S. Census Bureau data, such as the ACS and CPS, poverty and family income are discussed. In determining poverty, the U.S. Census Bureau uses a set of money income thresholds that vary by family size and composition. A family, along with each individual in it, is considered poor if the family's total income is less than that family's threshold. The poverty thresholds do not vary geographically and are adjusted annually for inflation using the Consumer Price Index. The official poverty definition counts money income before taxes and does not include capital gains and noncash benefits (such as public housing, Medicaid, and food stamps).

Family income includes all monetary income from all sources (including jobs, businesses, interest, rent, and Social Security payments) over a 12-month period. The income of nonrelatives living in the household is excluded, but the income of all family members age 15 or older (age 14 or older in years prior to 1989), including those temporarily living outside of the household, is included.

Limitations of the Data

The relatively small sizes of the American Indian/Alaska Native and Pacific Islander populations pose many measurement difficulties when conducting statistical analyses. Even in larger surveys, the numbers of American Indians/Alaska Natives and Pacific Islanders included in a sample are often small. Researchers studying data on these two populations often face small sample sizes that reduce the reliability of results. Survey data for American Indians/Alaska Natives often have somewhat higher standard errors than data for other racial/ethnic groups. Due to large standard errors, differences that seem substantial are often not statistically significant and, therefore, not cited in the text.

Data on American Indians/Alaska Natives are often subject to inaccuracies that can result from respondents self-identifying their race/ethnicity. According to research on the collection of race/ethnicity data conducted by the Bureau of Labor Statistics in 1995, the categorization of American Indian and Alaska Native is the least stable self-identification. The racial/ethnic categories presented to a respondent, and the way in which the question is asked, can influence the response, especially for individuals who consider themselves as being of mixed race or ethnicity. These data limitations should be kept in mind when reading this report.

As mentioned above, Asians and Pacific Islanders are combined into one category in indicators for which the data were not collected separately for the two groups. The combined category can sometimes mask significant differences between subgroups. For example, prior to 2011, the National Assessment of Educational Progress (NAEP) collected data that did not allow for separate reporting of estimates for Asians and Pacific Islanders. Information from *Digest of Education Statistics, 2015* (table 101.20), based on the Census Bureau Current Population Reports, indicates that 96 percent of all Asian/Pacific Islander 5- to 24-year-olds are Asian. This combined category for Asians/Pacific Islanders is more representative of Asians than Pacific Islanders.

Symbols

In accordance with the NCES Statistical Standards, many tables in this volume use a series of symbols to alert the reader to special statistical notes. These symbols, and their meanings, are as follows:

— Not available.

† Not applicable.

Rounds to zero.

! Interpret data with caution. The coefficient of variation (CV) for this estimate is between 30 and 50 percent.

‡ Reporting standards not met. Either there are too few cases for a reliable estimate or the coefficient of variation (CV) for this estimate is 50 percent or greater.

* $p < .05$ Significance level.

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Introduction

Educators, policymakers, and parents alike are focused on ensuring the academic success of our nation's students. These efforts interact with the expanding use of technology, which affects the lives of students both inside and outside of the classroom. Thus, the role that technology plays in education is an evolving area of research that continues to grow in importance. While access to technology can provide valuable learning opportunities to students, it does not guarantee successful outcomes. Designing successful practices for student use of technology is but one piece of the puzzle in the continued effort to elevate the educational experiences of all students. Schools, teachers, communities, and families play a critical role in successfully integrating technology into teaching, learning, and assessment.

Recent legislation acknowledges the growing role that technology plays in students' daily lives. The Every Student Succeeds Act (ESSA) provides guidance to state governments on how to receive supplemental federal funding for public education. As part of the ESSA legislation, the Institute of Education Sciences (IES) is required to produce a report on the educational impact of access to digital learning resources (DLR) outside of the classroom. Specifically, ESSA requests that IES conduct the following research:

1. An analysis of student habits related to DLR outside of the classroom, including the location and types of devices and technologies that students use for educational purposes;
2. An identification of the barriers students face in accessing DLR outside of the classroom;
3. A description of the challenges that students who lack home internet access face, including challenges related to student participation and engagement in the classroom, and homework completion;
4. An analysis of how the barriers and challenges such students face impact the instructional practices of educators; and
5. A description of the ways in which state education agencies, local education agencies, schools, and other entities, including partnerships of such entities, have developed effective means to address the barriers and challenges students face in accessing DLR outside of the classroom.

This report, produced by IES's National Center for Education Statistics (NCES), responds to the ESSA mandate for an analysis of the educational impact of access to DLR outside of the classroom.

Report Overview and Methods

This report draws upon the most recently available nationally representative data sources, existing research, and relevant state and local intervention efforts to examine the five research areas identified in ESSA, and to provide an overview of student access to DLR outside of the classroom. To address research areas 1 and 2, nationally and internationally representative survey data collected by NCES, the Census Bureau, and other organizations were analyzed in the form of brief indicators describing student access to DLR outside of the classroom. The statistical sources for the report generally consist of surveys with the most recent data (i.e., from 2015), due to the rapidly changing nature of DLR.

Student Access to Digital Learning Resources Outside of the Classroom focuses primarily on children between the ages of 3 and 18. Most indicators in the report summarize data from sample surveys conducted by NCES or household surveys conducted by the Census Bureau such as the American Community Survey (ACS) and Current Population Survey (CPS). Due to differences in the survey populations and the indicator topics of interest, the report indicators reference either children in a specific age range or students in a specific age range or grade level. Each indicator specifies which population is being discussed in its text and figures.

The summary of existing research and relevant state and local intervention efforts described in this report addresses topics for which limited or no recent nationally representative statistical data sources are available (i.e., research areas 3, 4 and 5). For research area 3, a summary of existing research, combined with a set of indicators drawing data from national and international surveys, describes the challenges faced by students who lack home access to the Internet and DLR. The summary of existing research focuses on empirical studies published in peer-reviewed journals since 2005 in order to describe recent patterns of DLR access outside of the classroom. The state and local intervention efforts by organizations working to improve technology access for students that are cited in this report focus on efforts conducted in 2015 and 2016 (2015 being the most recent data year reported in the indicators and 2016 being the year immediately after, when the report was in production).

Digital Learning Resources

As defined in ESSA (2015), the term "digital learning" refers to "any instructional practice that effectively uses technology to strengthen a student's learning experience and encompasses a wide spectrum of tools and practices" (p. 1969). This includes:

> (a) interactive learning resources, digital learning content (which may include openly licensed content), software, or simulations, that engage students in academic content; (b) access to online databases and other primary source documents; (c) the use of data and information to personalize learning and provide targeted supplementary instruction; (d) online and computer-based assessments; (e) learning environments that allow for rich collaboration and communication, which may include student collaboration with content experts and peers; (f) hybrid or blended learning, which occurs under direct instructor supervision at a school or other location away from home and, at least in part, through online delivery of instruction with some element of student control over time, place, path, or pace; and (g) access to online course opportunities for students in rural or remote areas. (p. 1969)

As described above, a variety of technological tools and practices can fall under the category of "digital learning resources." For the purpose of this report, DLR refers to computers (i.e., laptops, desktops, and notebooks), mobile devices (i.e., smart phones and tablets), and broadband internet. This report assumes that students primarily engage in digital learning through these resources and that they are most imperative to student learning experiences.

In 2010, the Federal Communications Commission (FCC) defined "broadband" as internet access with speeds of 4 Mbps for downloads and 1 Mbps for uploads (FCC 2015). Over time, the number of users per household increased, and subsequently in 2015 the FCC changed the definition of broadband to speeds of at least 25 Mbps for downloads and 3 Mbps for uploads. The terms "broadband" and "high-speed" are used interchangeably in this report.

Federal Policy Context

A number of federal policies worked to increase the availability of DLR to students. For example, the FCC implemented the Schools and Libraries program (E-rate) in 1997 in an effort to make internet access and telecommunications more affordable, and thus more accessible, to eligible schools and libraries (FCC 2016b). While schools and libraries must still cover some of the costs of these DLR, E-rate provided substantial discounts that were commensurate with the needs of the community, with high-poverty areas receiving priority funding. In addition to E-rate, in 2012 the FCC introduced the Connect America Fund, which increased home internet access by providing broadband network upgrades (FCC 2015).

In addition, the Enhancing Education Through Technology program, which was part of the American Recovery and Reinvestment Act of 2009, invested in technology and education reform (State Educational Technology Directors Association 2010). In 2013, the

White House's ConnectED Initiative raised public and private contributions, with the goal of providing 99 percent of students with broadband internet access in their classrooms and libraries by 2018 (The White House, Office of the Press Secretary 2015). Other federal department- and agency-level programs included Community Connect by the Department of Agriculture (U.S. Department of Agriculture 2016), the Broadband Technology Opportunities Program of the National Telecommunications and Information Administration, and ConnectHome by the Department of Housing and Urban Development. These programs aimed to bring broadband access to rural communities, encourage the adoption of broadband internet at home, and help low-income households obtain access at an affordable price (U.S. Department of Commerce n.d.; U.S. Department of Housing and Urban Development 2015).

Whereas ESSA outlined the steps that states should take to qualify for supplemental education funding, it did not make specific recommendations regarding how to most efficiently use these funds to promote technology-based learning. In 2014, the Office of Educational Technology provided examples of ways in which federal grant funding could be used to support teaching and learning with technology, including supporting professional development for educators, investing in DLR (e.g., software, devices) for students, and using technology to increase communication and collaboration between educators and stakeholders (e.g., parents, STEM professionals) (Culatta 2014). The Partners in Education research by the Department of Education also emphasized the importance of supporting teachers by highlighting the role of collaboration between parents and educators (Fox and Jones 2016).

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Section 1: Student Use of Digital Learning Resources Outside of the Classroom

This section presents nine indicators based on analyses of the most recently available nationally and internationally representative survey data that provide an overview of student habits related to digital learning resources (DLR) outside of the classroom. The first six indicators describe the percentages of children in the United States who have access to and use computers and the Internet in their homes and other locations outside of school. Information is presented for children overall as well as by characteristics of children, their families, and their home locations. The final three indicators provide comparisons within the United States and at the international level regarding access to DLR outside of the classroom.

Access to and Use of Digital Learning Resources in the United States

Results from the indicator analyses show that 94 percent of children ages 3 to 18 had a computer at home and 61 percent of children ages 3 to 18 used the Internet at home in 2015 (*Indicators 1* and *2*). The percentages of children having computer and internet access were higher for children who were older, whose parents had higher levels of educational attainment, and whose families had higher incomes. For those children who had access to the Internet in 2015, the two locations with the highest reported levels of internet access were at home (86 percent) and at school (65 percent), and the two most common means of internet access at home were a high-speed internet service and a mobile internet service or data plan (*Indicators 3* and *4*). In 2015, about 88 percent of 8th-graders and 83 percent of 4th-graders reported that they used a computer at home, and 80 percent of 8th-graders reported using a computer for schoolwork on a weekday (*Indicators 5* and *6*). The percentages of students using a computer at home and using a computer for schoolwork varied by student and family characteristics.

Access to Digital Learning Resources at the State and International Level

The percentages of households with computer and internet access varied by state. For example, the percentage of households with internet access ranged from 62 percent in Mississippi to 85 percent each in New Hampshire and Washington (*Indicator 7*). When comparing the United States with other countries, the United States had higher percentages of students with computer and internet access than the average of countries participating in the Trends in International Mathematics and Science Study (*Indicator 8*). Similarly, the United States had a higher percentage of 16- to 19-year-olds using spreadsheet or word processing software every day than the average of countries in the Organization for Economic Cooperation and Development (*Indicator 9*).

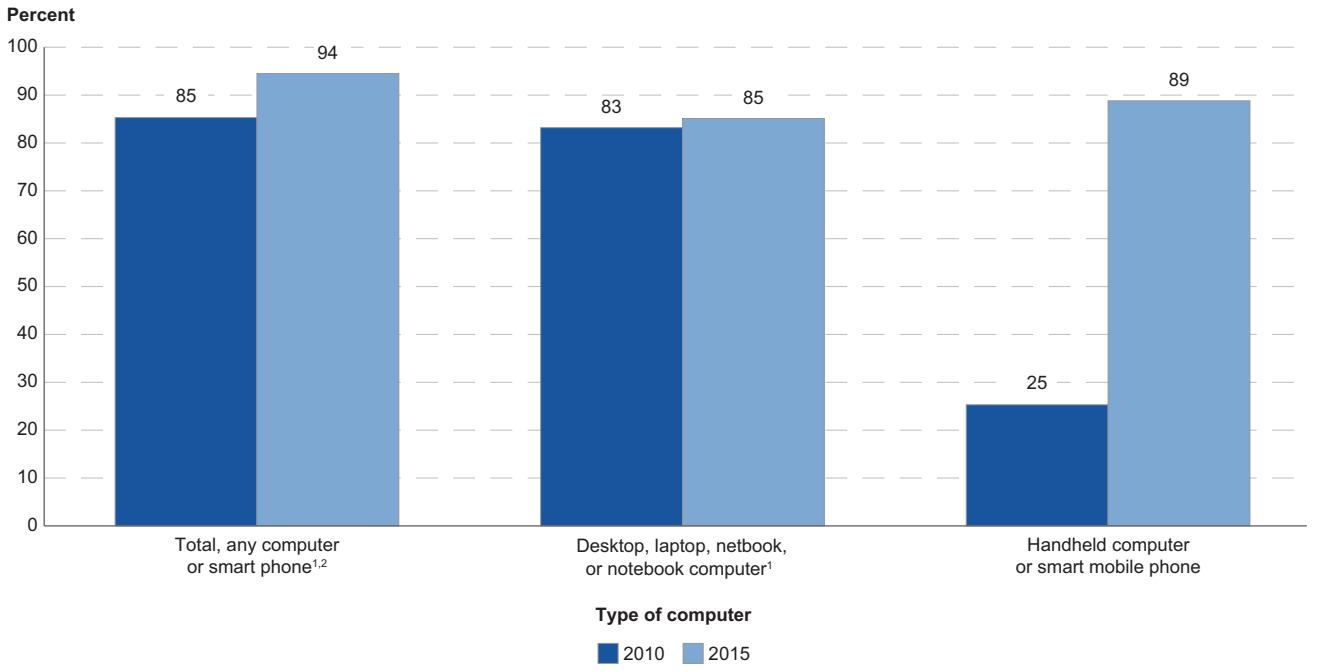
Indicator 1

Prevalence of Computer Access at Home

In 2015, the percentage of children ages 3 to 18 living in households that had a desktop, laptop, netbook, or notebook computer was highest for children with family incomes of over $100,000 (97 percent) and lowest for children with family incomes of less than $10,000 (58 percent). The percentage of children living in households that had a handheld computer or smart mobile phone was also highest for children with family incomes of over $100,000 (96 percent) and lowest for children with family incomes of less than $10,000 (74 percent).

Prior research suggests access to computers outside of the classroom varies by child and family characteristics. Lower rates of computer access at home were found among children from families with lower incomes, children whose parents had lower levels of educational attainment, and children who were of racial/ethnic minorities (DeBell and Chapman 2006; Gant, Turner-Lee, and Li 2010). This indicator uses data from the American Community Survey (ACS) to examine the percentages of children ages 3 to 18 living in households that had different types of computers at home in 2015, by selected child and family characteristics.

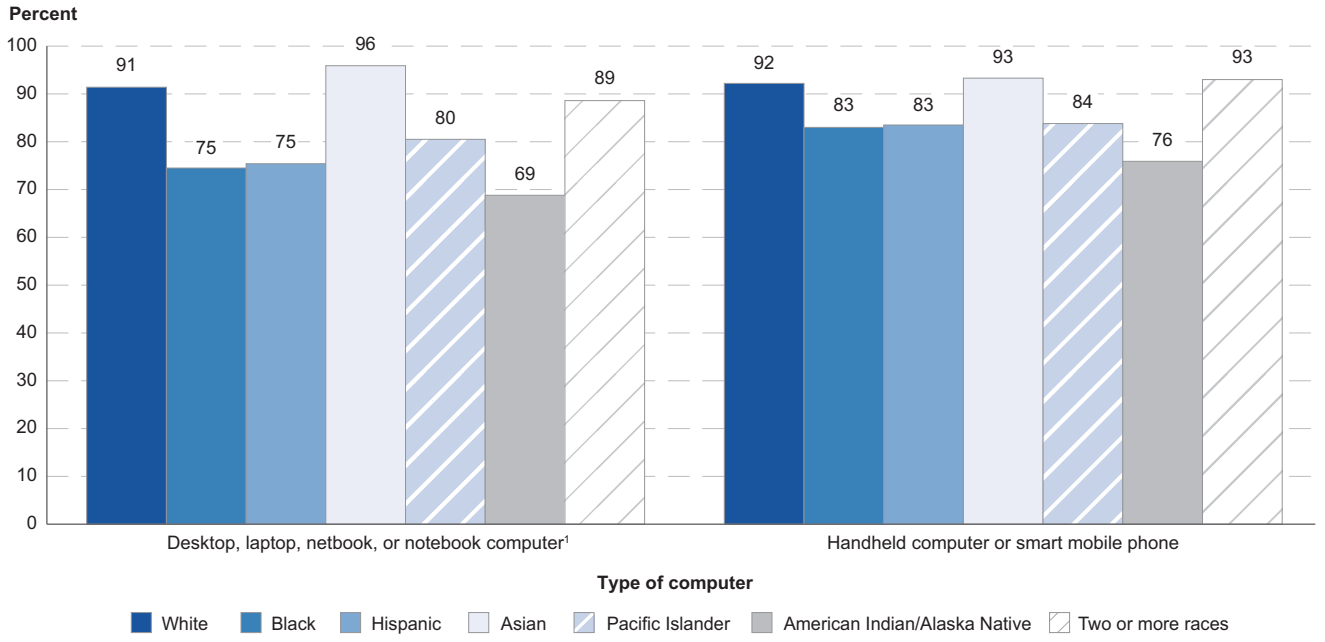
Figure 1.1. Percentage of children ages 3 to 18 living in households that had a computer, by type of computer: 2010 and 2015



[1] In addition to the types of computers specified, includes a small percentage (less than 1 percent) of children whose households have "Some other type of computer" not listed in the survey questions.
[2] Households indicating that they had computers/devices in both categories—that is, desktop, laptop, netbook, or notebook computers as well as handheld computers or smart mobile phones—were counted only once in the total. Therefore, the total is less than the sum of the two categories.
NOTE: Data are based on children living in households and exclude children living in institutions (e.g., prisons or nursing facilities). Percentages refer to children whose household members own or use at home any of the specified devices. Estimates for 2010 are based on the Current Population Survey, while estimates for 2015 are based on the American Community Survey. As a result, estimates for 2010 may not be comparable to those for 2015.
SOURCE: U.S. Department of Commerce, Census Bureau, Current Population Survey (CPS), October 2010; and American Community Survey (ACS), 2015. See *Digest of Education Statistics 2016*, table 702.10.

In 2015, about 94 percent of children ages 3 to 18 lived in households that had a computer: 85 percent of children lived in households with a desktop, laptop, netbook, or notebook computer, and 89 percent of children lived in households with a handheld computer or smart mobile phone.[1] In 2010, about 85 percent of children ages 3 to 18 lived in households with a computer: 83 percent lived in households with a desktop, laptop, netbook, or notebook computer, and 25 percent lived in households with a handheld computer or smart mobile phone. Estimates for 2010 are based on the Current Population Survey (CPS), while estimates for 2015 are based on the ACS. As a result, estimates for 2010 may not be comparable to those for 2015, though the questionnaire items were similar in nature.

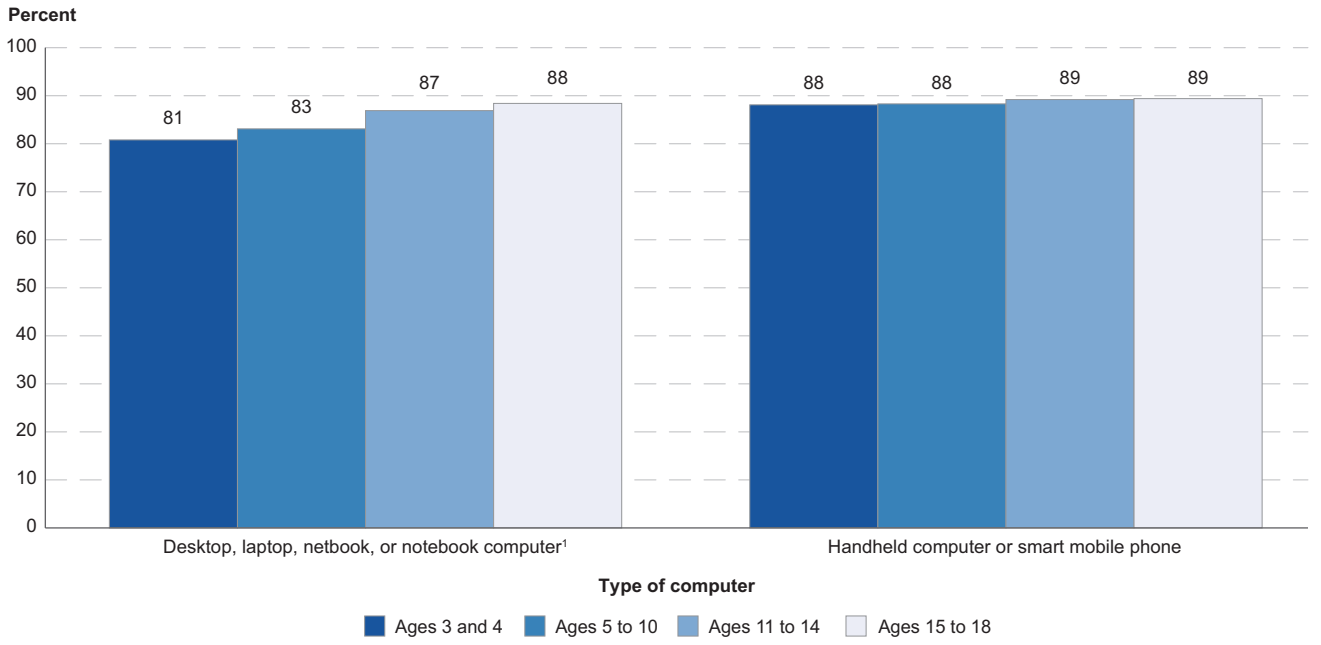
Figure 1.2. Percentage of children ages 3 to 18 living in households that had a computer, by type of computer and race/ethnicity: 2015



[1] In addition to the types of computers specified, includes a small percentage (less than 1 percent) of children whose households have "Some other type of computer" not listed in the survey questions.
NOTE: Data are based on children living in households and exclude children living in institutions (e.g., prisons or nursing facilities). Percentages refer to children whose household members own or use at home any of the specified devices. Race categories exclude persons of Hispanic ethnicity. Although rounded numbers are displayed, the figures are based on unrounded estimates.
SOURCE: U.S. Department of Commerce, Census Bureau, American Community Survey (ACS), 2015. See *Digest of Education Statistics 2016*, table 702.10.

In 2015, the percentage of children ages 3 to 18 living in households that had a desktop, laptop, netbook, or notebook computer was highest for Asian children (96 percent), followed by White children (91 percent), children of Two or more races (89 percent), Pacific Islander children (80 percent), Hispanic children (75 percent), Black children (75 percent), and American Indian/Alaska Native children (69 percent). Higher percentages of Asian children (93 percent), children of Two or more races (93 percent), and White children (92 percent) lived in households with a handheld computer or smart mobile phone than of Pacific Islander children (84 percent), Hispanic children (83 percent), Black children (83 percent), and American Indian/Alaska Native children (76 percent). In addition, the percentages of children living in households with a handheld computer or smart mobile phone were higher for Pacific Islander, Hispanic, and Black children than for American Indian/Alaska Native children.

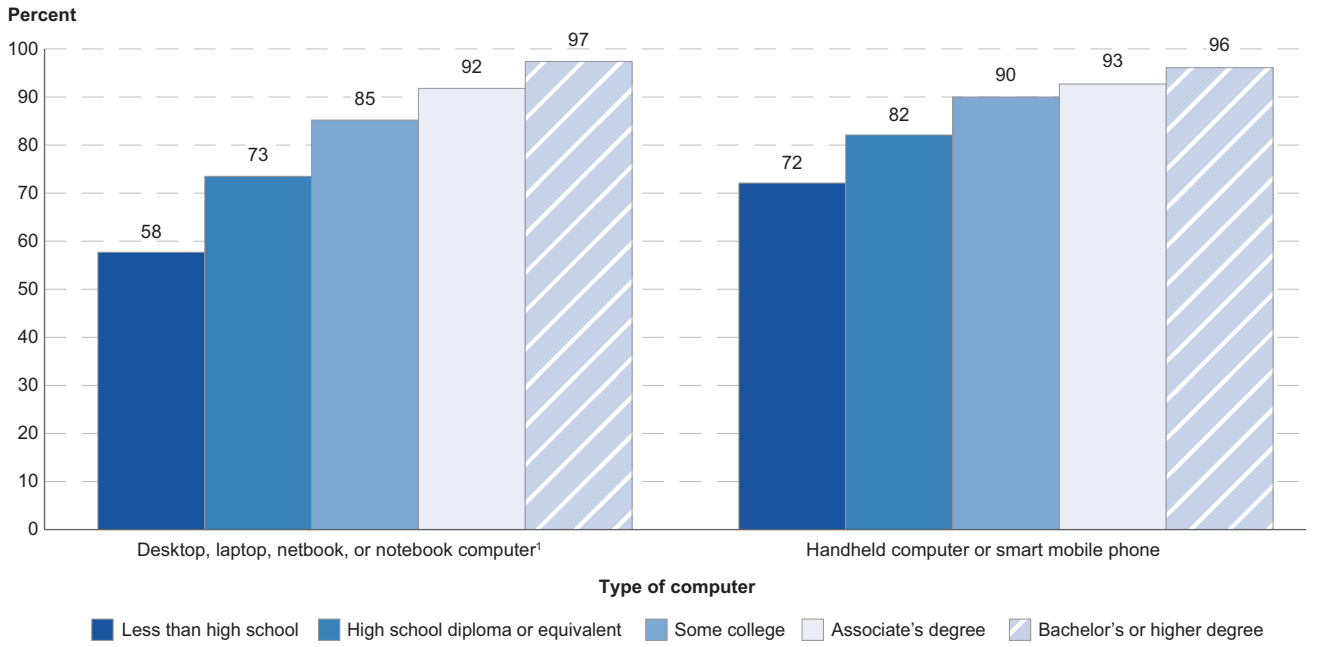
Figure 1.3. Percentage of children ages 3 to 18 living in households that had a computer, by type of computer and age: 2015



[1] In addition to the types of computers specified, includes a small percentage (less than 1 percent) of children whose households have "Some other type of computer" not listed in the survey questions.
NOTE: Data are based on children living in households and exclude children living in institutions (e.g., prisons or nursing facilities). Percentages refer to children whose household members own or use at home any of the specified devices. Although rounded numbers are displayed, the figures are based on unrounded estimates.
SOURCE: U.S. Department of Commerce, Census Bureau, American Community Survey (ACS), 2015. See *Digest of Education Statistics 2016*, table 702.10.

The percentages of children ages 3 to 18 living in households that had a desktop, laptop, netbook, or notebook computer in 2015 were higher for children in older age subgroups. For instance, 88 percent of children ages 15 to 18 and 87 percent of children ages 11 to 14 lived in households with a desktop, laptop, netbook, or notebook computer, compared with 83 percent of children ages 5 to 10 and 81 percent of children ages 3 and 4. In addition, higher percentages of children ages 15 to 18 and 11 to 14 (89 percent each) lived in households with a handheld computer or smart mobile phone than of children ages 5 to 10 and ages 3 and 4 (88 percent each) in 2015.

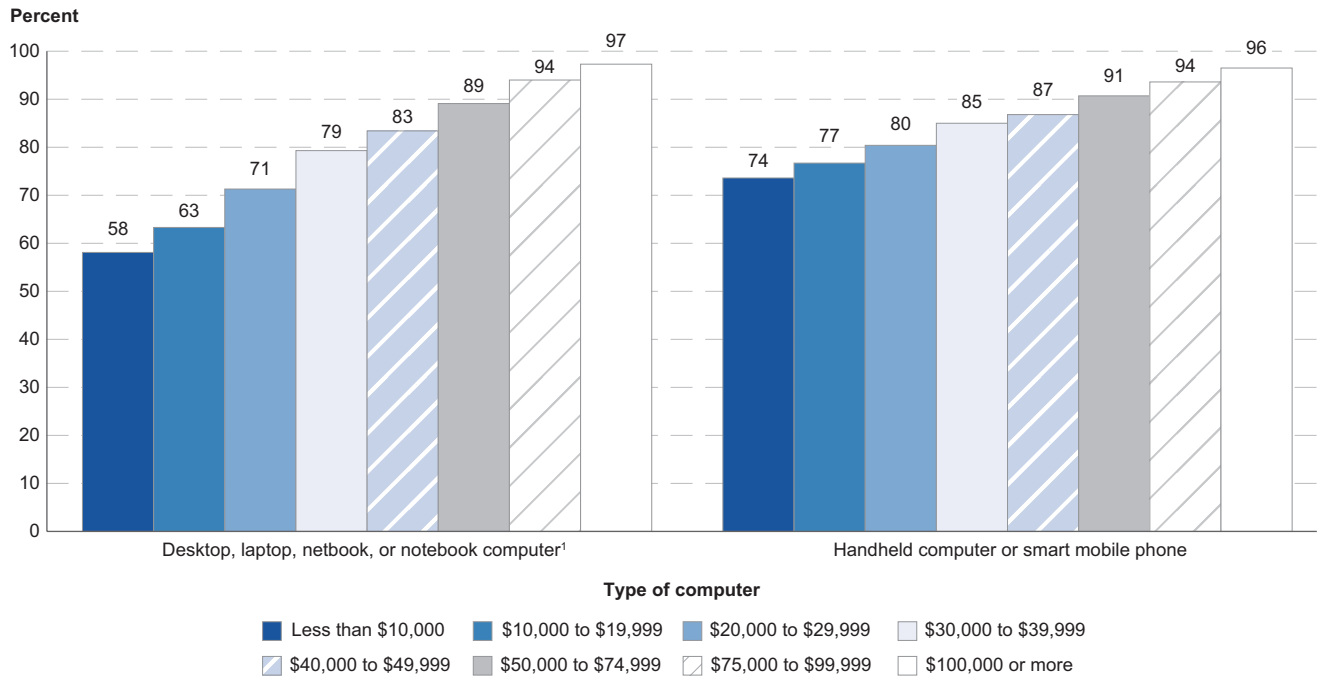
Figure 1.4. Percentage of children ages 3 to 18 living in households that had a computer, by type of computer and highest level of education attained by either parent: 2015



[1] In addition to the types of computers specified, includes a small percentage (less than 1 percent) of children whose households have "Some other type of computer" not listed in the survey questions.
NOTE: Data are based on children living in households and exclude children living in institutions (e.g., prisons or nursing facilities). Percentages refer to children whose household members own or use at home any of the specified devices. Highest education level refers to that of any parent residing with the child (including an adoptive or stepparent). Includes only children who resided with at least one of their parents.
SOURCE: U.S. Department of Commerce, Census Bureau, American Community Survey (ACS), 2015. See *Digest of Education Statistics 2016*, table 702.10.

The percentages of children ages 3 to 18 living in households that had a computer in 2015 were also higher for children whose parents had higher levels of educational attainment. For instance, the percentages of children ages 3 to 18 living in households with a desktop, laptop, netbook, or notebook computer in 2015 were higher for children whose parents had attained a bachelor's or higher degree (97 percent) and those whose parents had attained an associate's degree (92 percent) than for children whose parents had attained some college education (85 percent), those whose parents had completed only high school (73 percent), and those whose parents had not completed high school (58 percent). Similarly, the percentages of children living in households with a handheld computer or smart mobile phone were higher for those whose parents had attained a bachelor's or higher degree (96 percent), an associate's degree (93 percent), and some college education (90 percent) than for those whose parents had completed only high school (82 percent) and those whose parents had not completed high school (72 percent).

Figure 1.5. Percentage of children ages 3 to 18 living in households that had a computer, by type of computer and family income: 2015



[1] In addition to the types of computers specified, includes a small percentage (less than 1 percent) of children whose households have "Some other type of computer" not listed in the survey questions.
NOTE: Family income shown in current dollars. Data are based on children living in households and exclude children living in institutions (e.g., prisons or nursing facilities). Percentages refer to children whose household members own or use at home any of the specified devices.
SOURCE: U.S. Department of Commerce, Census Bureau, American Community Survey (ACS), 2015. See *Digest of Education Statistics 2016*, table 702.10.

The percentage of children ages 3 to 18 living in households that had a computer increased with family income. For example, the percentage of children ages 3 to 18 living in households with a desktop, laptop, netbook, or notebook computer was highest for children with family incomes over $100,000 (97 percent) and lowest for children with family incomes of less than $10,000 (58 percent). Similarly, the percentage of children ages 3 to 18 living in households with a handheld computer or smart mobile phone in 2015 was highest for children with family incomes over $100,000 (96 percent) and lowest for children with family incomes of less than $10,000 (74 percent).

Endnotes:
[1] Households indicating that they had computers/devices in both categories—that is, desktop, laptop, netbook, or notebook computers as well as handheld computers or smart mobile phones—were counted only once in the total. Therefore, the total is less than the sum of the two categories.

Reference tables: Table 1.1.

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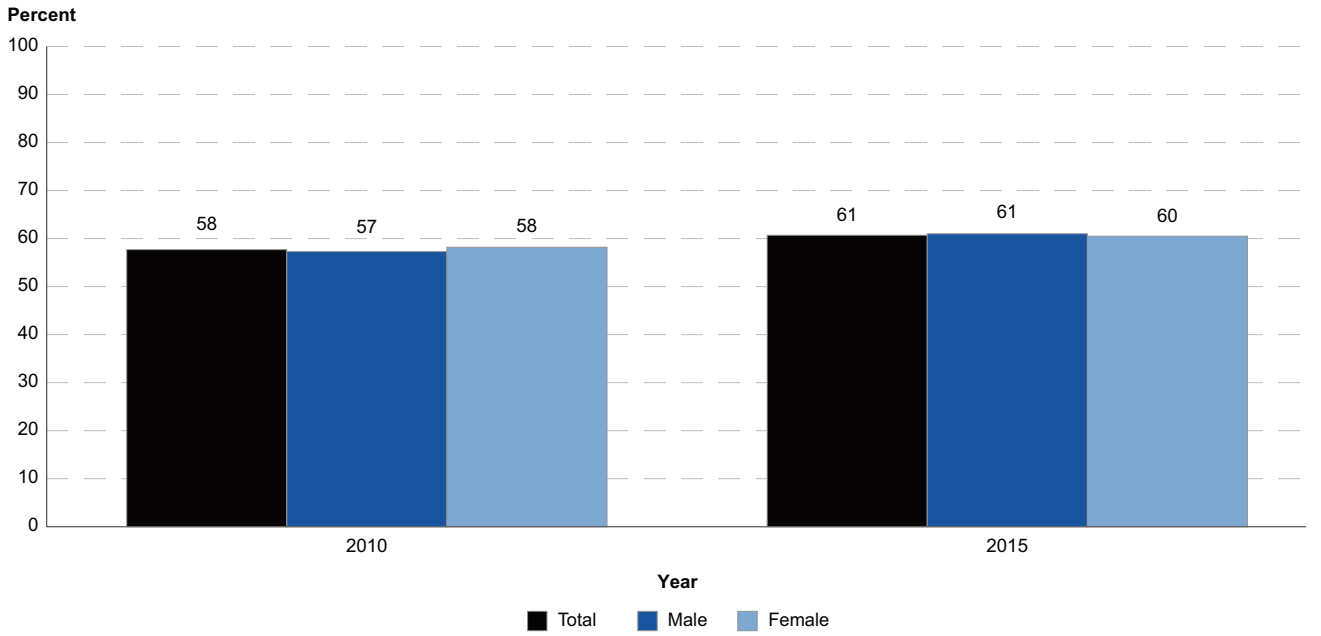
Indicator 2

Prevalence of Internet Use at Home

In 2015, a higher percentage of children ages 3 to 18 used the Internet at home than in 2010 (61 vs. 58 percent). Higher percentages of children who were White (66 percent), of Two or more races (64 percent), and Asian (63 percent) used the Internet at home in 2015 than did Black (53 percent), Hispanic (52 percent), and American Indian/Alaska Native children (49 percent).

Studies have shown that differences in internet access exist across students with different characteristics. For instance, households with members who are racial or ethnic minorities or have low levels of educational attainment or income are much less likely to have access to digital learning resources (DeBell and Chapman 2006; File and Ryan 2014; Horrigan and Duggan 2015). This indicator uses the Current Population Survey to examine the percentages of children ages 3 to 18 who used the Internet at home in 2015 by selected child and family characteristics, as well as changes from the percentages in 2010.[1] The characteristics examined include children's sex, race/ethnicity, and age; highest level of education attained by either parent;[2] and family income (in current dollars).

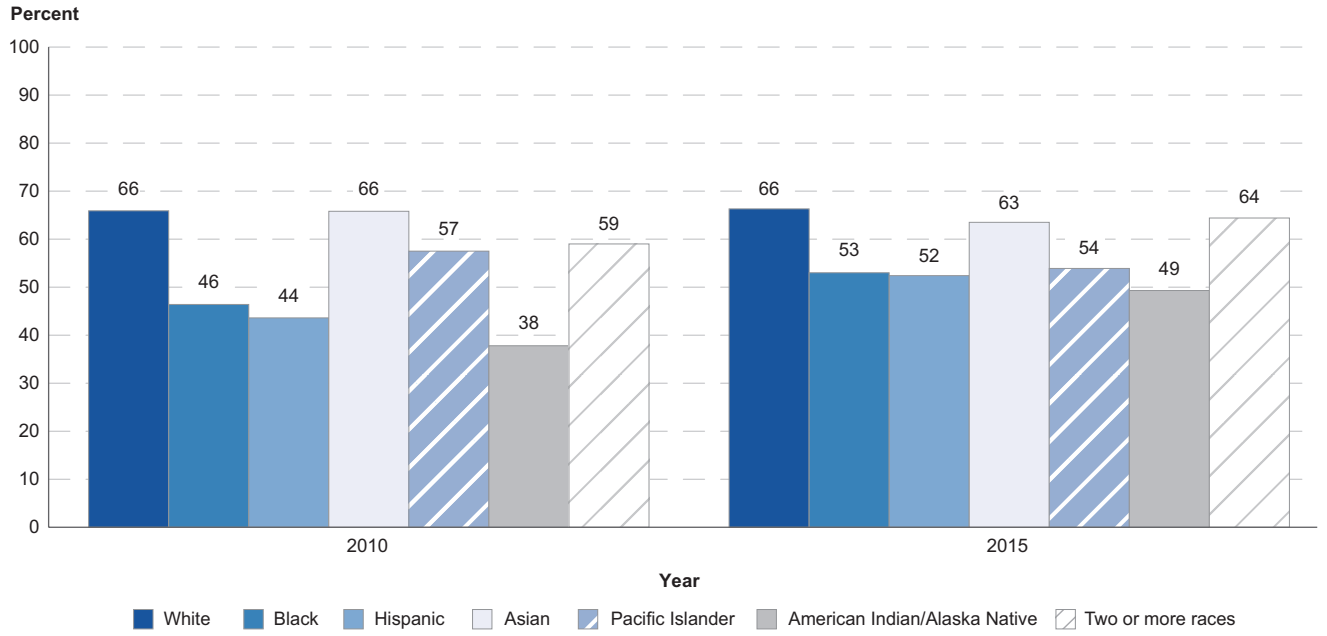
Figure 2.1. Percentage of children ages 3 to 18 who use the Internet at home, by sex: 2010 and 2015



NOTE: Data exclude children living in institutions (e.g., prisons or nursing facilities). Data for 2015 were collected in the July supplement to the Current Population Survey (CPS), while data for 2010 were collected in the October supplement. The July supplement consists solely of questions about computer and internet use. In contrast, the October supplement focuses on school enrollment, although it also includes questions about computer and internet use. Measurable differences in estimates across years could reflect actual changes in the population; however, differences could also reflect seasonal variations in data collection or differences between the content of the July and October supplements. Therefore, caution should be used when making year-to-year comparisons. Although rounded numbers are displayed, the figures are based on unrounded estimates.
SOURCE: U.S. Department of Commerce, Census Bureau, Current Population Survey (CPS), October 2010 and July 2015. See *Digest of Education Statistics 2016*, table 702.15.

In 2015, a higher percentage of children ages 3 to 18 used the Internet at home than in 2010 (61 vs. 58 percent). The percentages of male and female children who used the Internet at home were both higher in 2015 than in 2010 (61 vs. 57 percent for male children and 60 vs. 58 percent for female children); and, there were no measurable differences between the male and female percentages in 2010 and 2015.

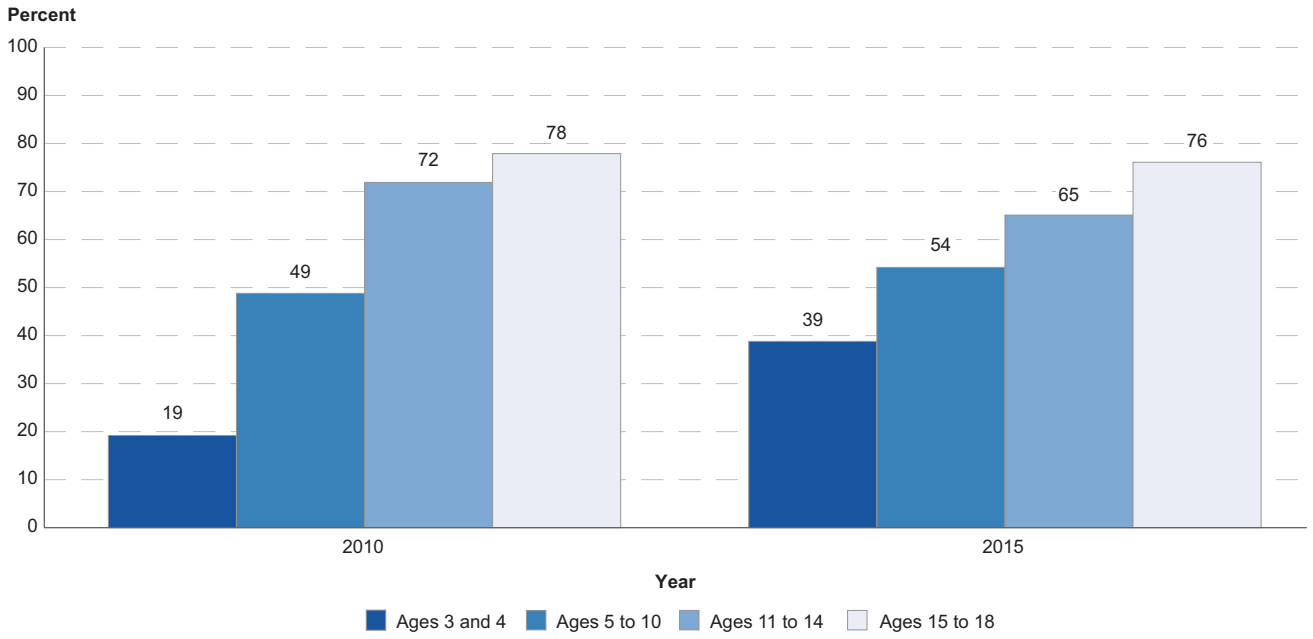
Figure 2.2. Percentage of children ages 3 to 18 who use the Internet at home, by race/ethnicity: 2010 and 2015



NOTE: Race categories exclude persons of Hispanic ethnicity. Data exclude children living in institutions (e.g., prisons or nursing facilities). Data for 2015 were collected in the July supplement to the Current Population Survey (CPS), while data for 2010 were collected in the October supplement. The July supplement consists solely of questions about computer and internet use. In contrast, the October supplement focuses on school enrollment, although it also includes questions about computer and internet use. Measurable differences in estimates across years could reflect actual changes in the population; however, differences could also reflect seasonal variations in data collection or differences between the content of the July and October supplements. Therefore, caution should be used when making year-to-year comparisons.
SOURCE: U.S. Department of Commerce, Census Bureau, Current Population Survey (CPS), October 2010 and July 2015. See *Digest of Education Statistics 2016*, table 702.15.

Higher percentages of children who were White (66 percent), of Two or more races (64 percent), and Asian (63 percent) used the Internet at home in 2015 than did Black (53 percent), Hispanic (52 percent), and American Indian/Alaska Native children (49 percent). The percentage of Pacific Islander children (54 percent) was not measurably different from that of any other racial/ethnic group. While the percentage of White children using the Internet at home was higher than the percentages of Black and Hispanic children in 2010 as well, the percentage differences between White and Black children's home internet use and between White and Hispanic children's home internet use (i.e., the home internet use gaps) narrowed between 2010 and 2015. The White-Black gap narrowed from 19 percentage points in 2010 to 13 percentage points in 2015, and the White-Hispanic gap narrowed from 22 percentage points in 2010 to 14 percentage points in 2015. These changes were driven by higher percentages of Black and Hispanic children using the Internet at home in 2015 than in 2010 (53 vs. 46 percent for Black children and 52 vs. 44 percent for Hispanic children).

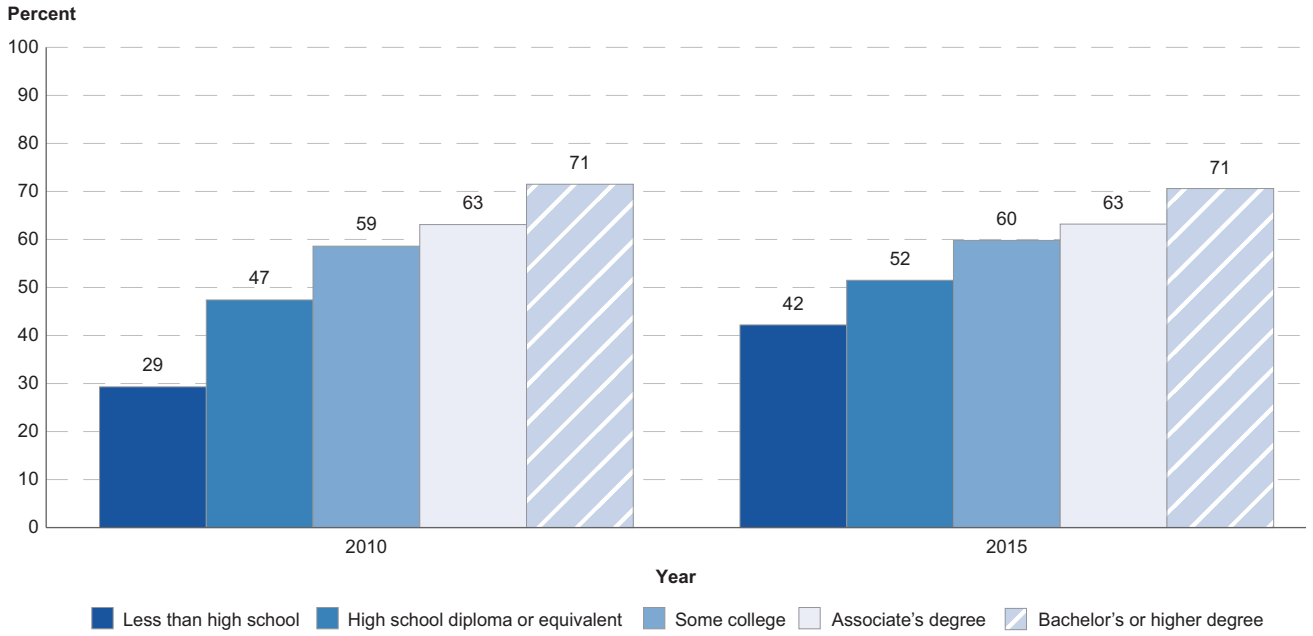
Figure 2.3. Percentage of children ages 3 to 18 who use the Internet at home, by age: 2010 and 2015



NOTE: Data exclude children living in institutions (e.g., prisons or nursing facilities). Data for 2015 were collected in the July supplement to the Current Population Survey (CPS), while data for 2010 were collected in the October supplement. The July supplement consists solely of questions about computer and internet use. In contrast, the October supplement focuses on school enrollment, although it also includes questions about computer and internet use. Measurable differences in estimates across years could reflect actual changes in the population; however, differences could also reflect seasonal variations in data collection or differences between the content of the July and October supplements. Therefore, caution should be used when making year-to-year comparisons.
SOURCE: U.S. Department of Commerce, Census Bureau, Current Population Survey (CPS), October 2010 and July 2015. See *Digest of Education Statistics 2016*, table 702.15.

The percentage of children who used the Internet at home was higher for older children than for younger children. In 2015, about 76 percent of children ages 15 to 18 and 65 percent of children ages 11 to 14 used the Internet at home, compared to 54 percent of children ages 5 to 10 and 39 percent of children ages 3 and 4. The percentage of children using the Internet at home was higher in 2015 than in 2010 for children ages 3 and 4 (39 vs. 19 percent) and 5 to 10 (54 vs. 49 percent); in contrast, the percentage was lower in 2015 than in 2010 for children ages 11 to 14 (65 v. 72 percent) and 15 to 18 (76 vs. 78 percent).

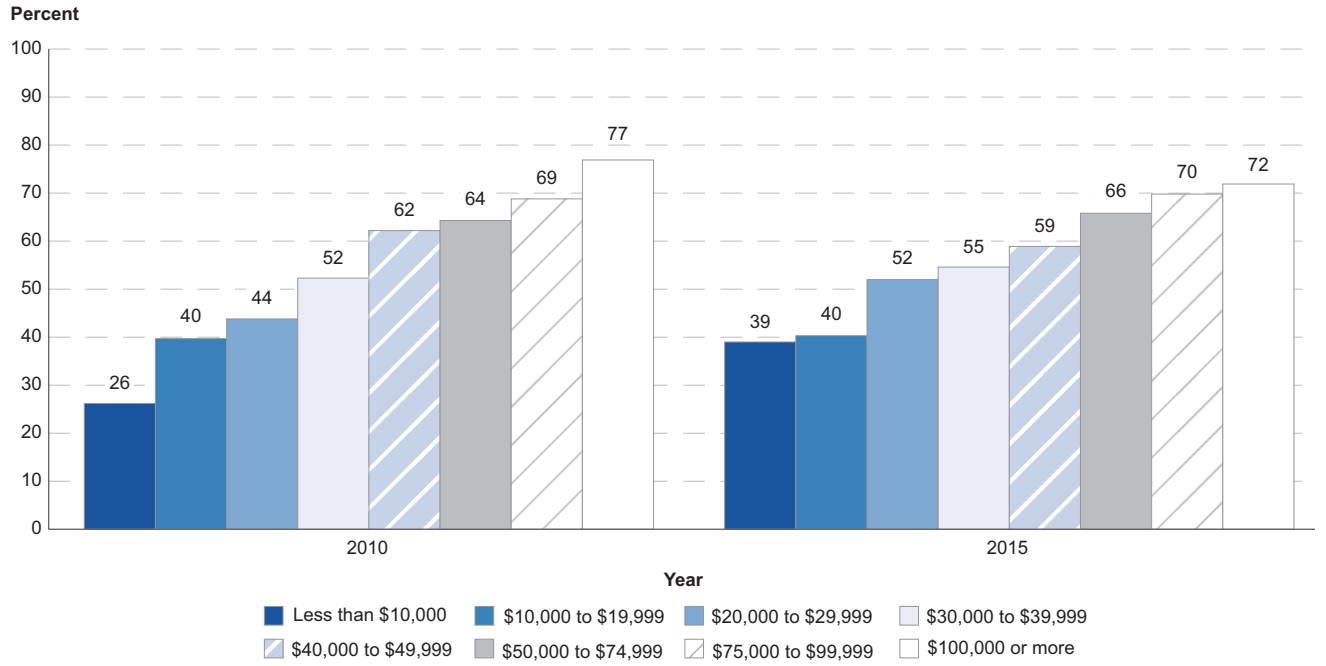
Figure 2.4. Percentage of children ages 3 to 18 who use the Internet at home, by highest level of education attained by either parent: 2010 and 2015



NOTE: Includes only children who resided with at least one of their parents (including an adoptive or stepparent). Data exclude children living in institutions (e.g., prisons or nursing facilities). Data for 2015 were collected in the July supplement to the Current Population Survey (CPS), while data for 2010 were collected in the October supplement. The July supplement consists solely of questions about computer and internet use. In contrast, the October supplement focuses on school enrollment, although it also includes questions about computer and internet use. Measurable differences in estimates across years could reflect actual changes in the population; however, differences could also reflect seasonal variations in data collection or differences between the content of the July and October supplements. Therefore, caution should be used when making year-to-year comparisons.
SOURCE: U.S. Department of Commerce, Census Bureau, Current Population Survey (CPS), October 2010 and July 2015. See *Digest of Education Statistics 2016*, table 702.15.

In general, the percentage of children using the Internet at home was higher for children whose parents attained higher levels of education. For instance, 71 percent of children whose parents had attained at least a bachelor's degree used the Internet at home in 2015, compared to 52 percent of children whose parents' highest education was a high school diploma or the equivalent and 42 percent of children whose parents had not completed high school. From 2010 to 2015, the home internet use gap between children whose parents had attained at least a bachelor's degree and children whose parents had not completed high school narrowed from 42 to 28 percentage points, and the gap between children whose parents had attained at least a bachelor's degree and children whose parents' highest education was a high school diploma or the equivalent narrowed from 24 to 19 percentage points. The percentage of children using the Internet at home was higher in 2015 than in 2010 for children whose parents' highest education was a high school diploma or the equivalent (52 vs. 47 percent) and for those whose parents had not completed high school (42 vs. 29 percent).

Figure 2.5. Percentage of children ages 3 to 18 who use the Internet at home, by family income: 2010 and 2015



NOTE: Family income shown in current dollars. Data for 2015 were collected in the July supplement to the Current Population Survey (CPS), while data for 2010 were collected in the October supplement. The July supplement consists solely of questions about computer and internet use. In contrast, the October supplement focuses on school enrollment, although it also includes questions about computer and internet use. Measurable differences in estimates across years could reflect actual changes in the population; however, differences could also reflect seasonal variations in data collection or differences between the content of the July and October supplements. Therefore, caution should be used when making year-to-year comparisons.
SOURCE: U.S. Department of Commerce, Census Bureau, Current Population Survey (CPS), October 2010 and July 2015. See *Digest of Education Statistics 2016*, table 702.15.

The percentage of children using the Internet at home was also generally higher for children with higher family income. In 2015, about 72 percent of children with a family income of $100,000 or more and 70 percent of children with a family income between $75,000 and $99,999 used the Internet at home, whereas 40 percent of children with a family income between $10,000 and $19,999 and 39 percent of children with a family income of less than $10,000 did so. The percentage of children using the Internet at home was higher in 2015 than in 2010 for children with a family income of less than $10,000 (39 vs. 26 percent), but it was lower in 2015 than in 2010 for children with a family income of $100,000 or more (72 vs. 77 percent). As a result, the home internet use gap between children in these two groups narrowed from 51 percentage points in 2010 to 33 percentage points in 2015. Additionally, the gap between children with a family income between $75,000 and $99,999 and children with a family income of less than $10,000 narrowed from 43 percentage points in 2010 to 31 percentage points in 2015; and the gap between children with a family income of $100,000 or more and children with a family income between $10,000 and $19,999 was smaller in 2015 (32 percentage points) than in 2010 (37 percentage points).

Endnotes:

[1] Data for 2015 were collected in the July supplement to the Current Population Survey (CPS), while data for 2010 were collected in the October supplement. The July supplement consists solely of questions about computer and internet use. In contrast, the October supplement focuses on school enrollment, although it also includes questions about computer and internet use. Measurable differences in estimates across years could reflect actual changes in the population; however, differences could also reflect seasonal variations in data collection or differences between the content of the July and October supplements. Therefore, caution should be used when making year-to-year comparisons.

[2] Highest education level of any parent residing with the child (including an adoptive or stepparent). Includes only children who resided with at least one of their parents.

Reference tables: Table 2.1.

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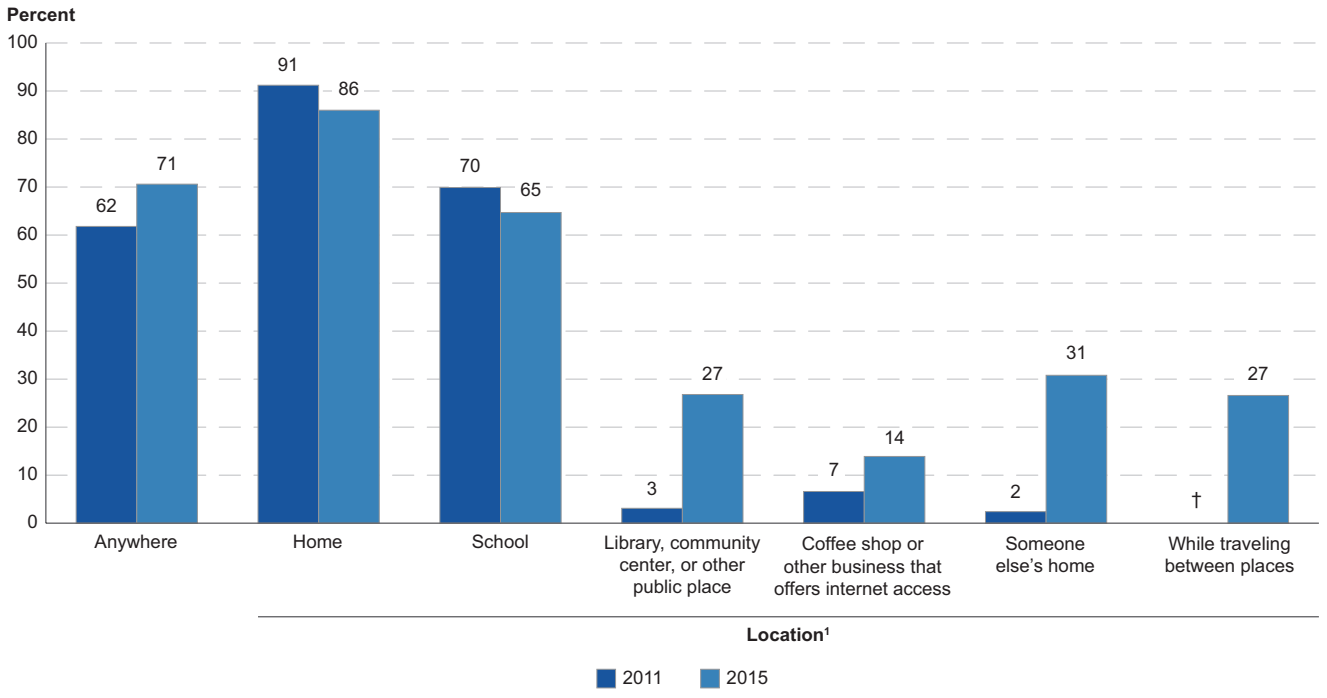
Indicator 3

Location of Internet Use

In 2015, about 71 percent of children ages 3 to 18 used the Internet in one or more locations. Among these children, 86 percent used the Internet at home; 65 percent at school; 31 percent at someone else's home; 27 percent at a library, community center, or other public place; and 14 percent at a coffee shop or other business offering internet access. In addition, 27 percent of these children used the Internet while traveling between places.

Internet use includes a wide variety of activities, from checking email or browsing the Web to watching videos or using mobile apps on all types of devices (e.g., computers, mobile phones, tablets, etc.). Using the Current Population Survey, this indicator examines where children ages 3 to 18 used the Internet in 2015 by selected child and family characteristics. It also discusses changes in children's internet use in some locations from 2011 and 2015. The previous indicator, *Prevalence of Internet Use at Home*, focused on the percentage of all children using the Internet at home, while this indicator examines the places where children with internet access used the Internet.

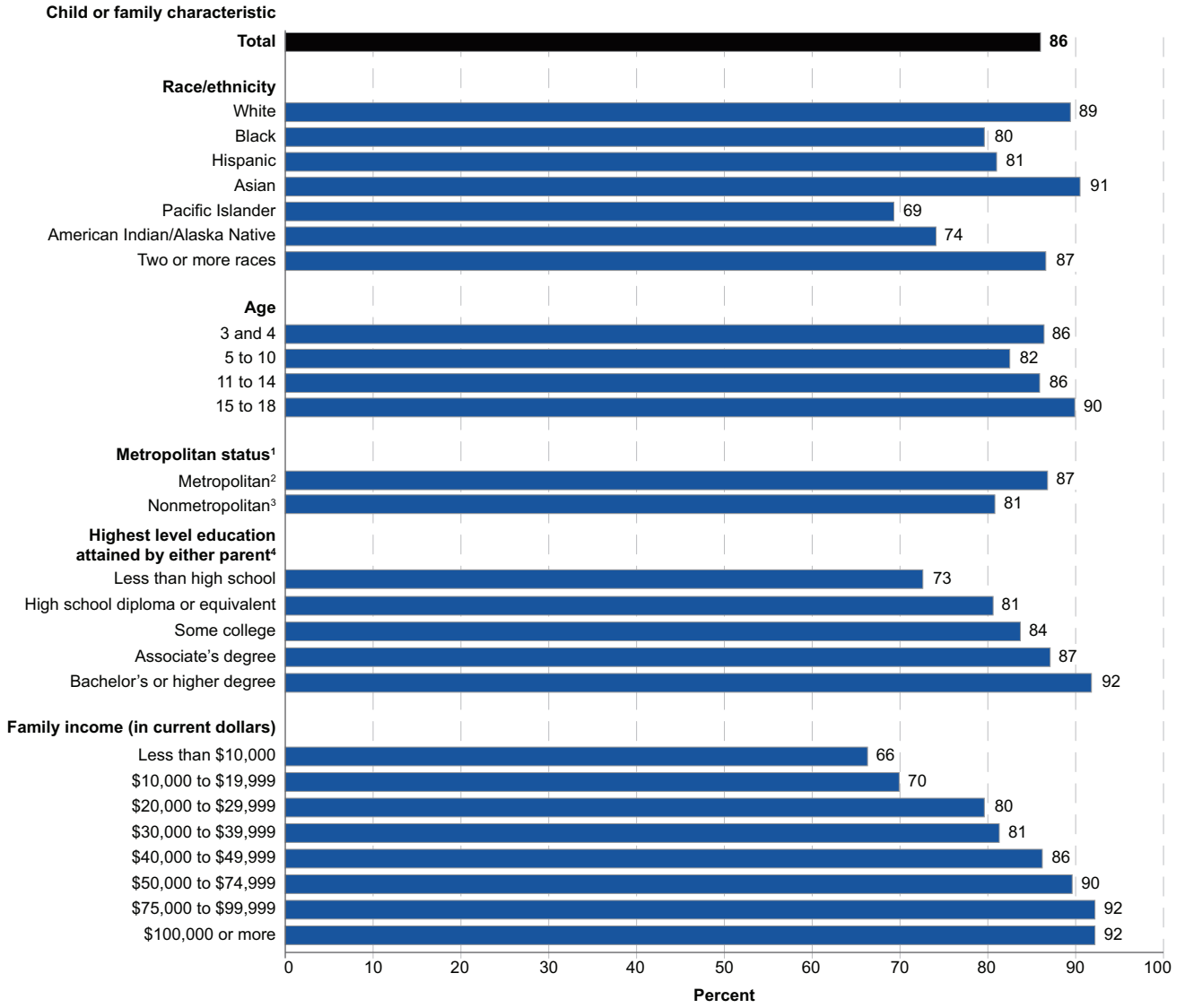
Figure 3.1. Percentage of children ages 3 to 18 who use the Internet anywhere, and among children who use the Internet anywhere, percentage using it in various locations: 2011 and 2015



† Not applicable.
¹ Percentages sum to more than 100 because a child could have used the Internet in more than one location.
NOTE: Data exclude children living in institutions (e.g., prisons or nursing facilities). Data on internet use while traveling between places were collected only in 2015.
SOURCE: U.S. Department of Commerce, Census Bureau, Current Population Survey (CPS), July 2011 and 2015. See *Digest of Education Statistics 2016*, table 702.20.

In 2015, about 71 percent of children ages 3 to 18 used the Internet anywhere. Among these children, 86 percent used the Internet at home; 65 percent at school; 31 percent at someone else's home; 27 percent at a library, community center, or other public place; and 14 percent at a coffee shop or other business offering internet access. In addition, 27 percent of these children used the Internet while traveling between places. A higher percentage of children used the Internet anywhere in 2015 than in 2011 (71 vs. 62 percent). However, among children who used the Internet anywhere, the percentages using the Internet at home and at school were lower in 2015 than in 2011 (86 vs. 91 percent for internet use at home and 65 vs. 70 percent for internet use at school).

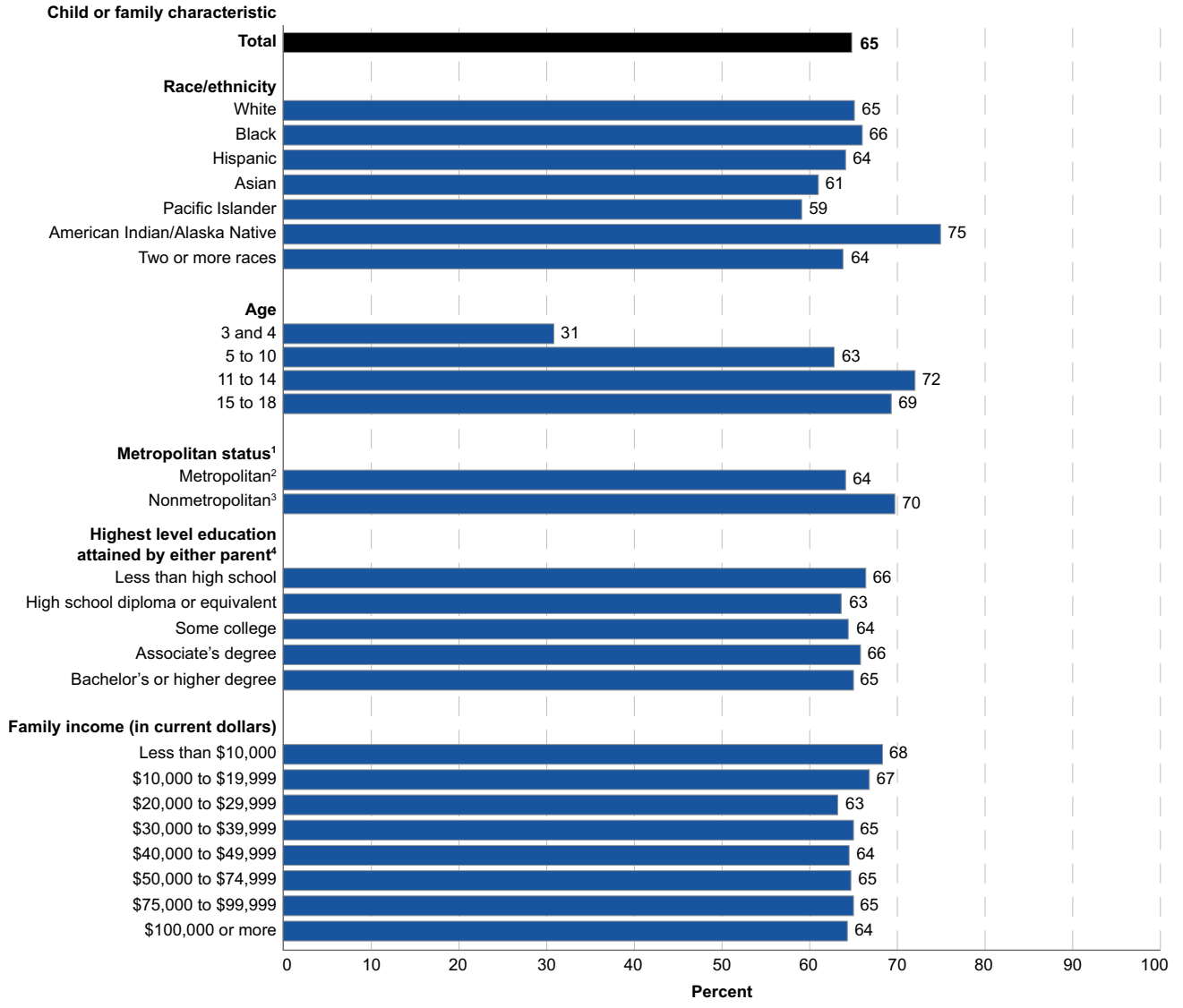
Figure 3.2. Among children ages 3 to 18 who use the Internet anywhere, percentage using it at home, by selected child and family characteristics: 2015



[1] Children living in areas whose metropolitan status was not identified are excluded from this figure. In 2015, less than 1 percent of children ages 3 to 18 lived in an area with nonidentified metropolitan status.
[2] Refers to metropolitan statistical areas, which contain at least one urbanized area with a population of 50,000 or more.
[3] Refers to areas that are outside of metropolitan statistical areas.
[4] Highest education level of any parent residing with the child (including an adoptive or stepparent). Includes only children who resided with at least one of their parents.
NOTE: Family income shown in current dollars. Race categories exclude persons of Hispanic ethnicity. Data exclude children living in institutions (e.g., prisons or nursing facilities).
SOURCE: U.S. Department of Commerce, Census Bureau, Current Population Survey (CPS), July 2015. See *Digest of Education Statistics 2016*, table 702.20.

There were differences in children's internet use at home in 2015 across all child and family characteristics examined. For instance, among children who used the Internet anywhere, the percentage using it at home was higher for children who were Asian (91 percent), White (89 percent), and of Two or more races (87 percent) than for those who were Hispanic (81 percent), Black (80 percent), and American Indian/Alaska Native (74 percent). Also, the percentage using the Internet at home was higher for children in metropolitan areas (87 percent) than for those in nonmetropolitan areas (81 percent). The percentage of children who used the Internet at home was also generally higher for older children, children whose parents had higher levels of educational attainment, and children with higher family incomes.

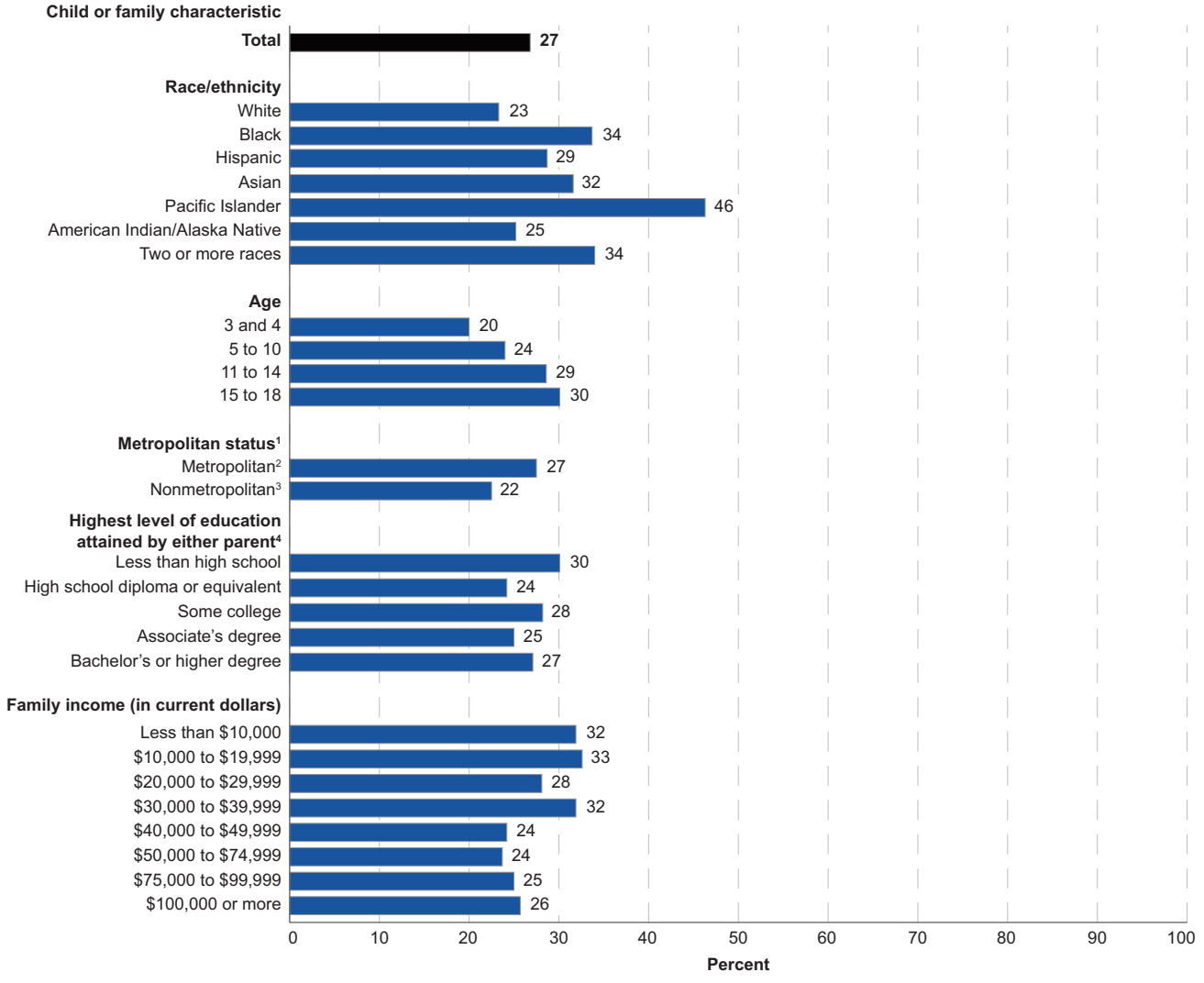
Figure 3.3. Among children ages 3 to 18 who use the Internet anywhere, percentage using it at school, by selected child and family characteristics: 2015



[1] Children living in areas whose metropolitan status was not identified are excluded from this figure. In 2015, less than 1 percent of children ages 3 to 18 lived in an area with nonidentified metropolitan status.
[2] Refers to metropolitan statistical areas, which contain at least one urbanized area with a population of 50,000 or more.
[3] Refers to areas that are outside of metropolitan statistical areas.
[4] Highest education level of any parent residing with the child (including an adoptive or stepparent). Includes only children who resided with at least one of their parents.
NOTE: Family income shown in current dollars. Race categories exclude persons of Hispanic ethnicity. Data exclude children living in institutions (e.g., prisons or nursing facilities). Although rounded numbers are displayed, the figures are based on unrounded estimates.
SOURCE: U.S. Department of Commerce, Census Bureau, Current Population Survey (CPS), July 2015. See *Digest of Education Statistics 2016*, table 702.20.

Compared to internet use at home, fewer differences and different patterns by child and family characteristics were observed for children's internet use at school. In 2015, among children who used the Internet anywhere, a higher percentage of American Indian/Alaska Native children (75 percent) used the Internet at school than did children who were White (65 percent), Hispanic (64 percent), of Two or more races (64 percent), and Asian (61 percent). Additionally, a higher percentage of children in nonmetropolitan areas (70 percent) than of those in metropolitan areas (64 percent) used the Internet at school. While the percentage of children who used the Internet at school was generally higher for older children than for younger children, there were no measureable differences by highest level of education attained by either parent and by family income in the percentages of children using the Internet at school.

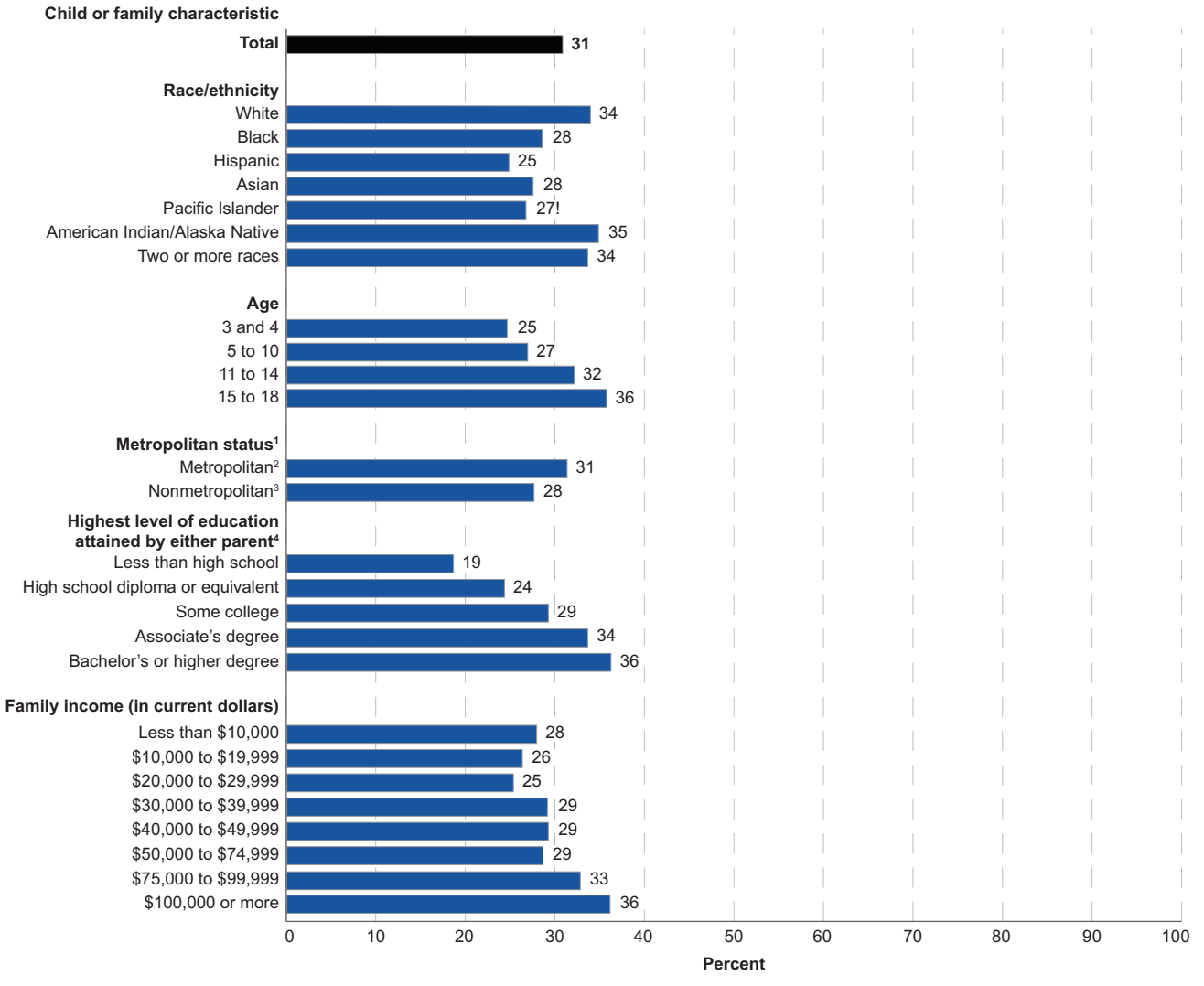
Figure 3.4. Among children ages 3 to 18 who use the Internet anywhere, percentage using it at a library, community center, or other public place, by selected child and family characteristics: 2015



[1] Children living in areas whose metropolitan status was not identified are excluded from this figure. In 2015, less than 1 percent of children ages 3 to 18 lived in an area with nonidentified metropolitan status.
[2] Refers to metropolitan statistical areas, which contain at least one urbanized area with a population of 50,000 or more.
[3] Refers to areas that are outside of metropolitan statistical areas.
[4] Highest education level of any parent residing with the child (including an adoptive or stepparent). Includes only children who resided with at least one of their parents.
NOTE: Family income shown in current dollars. Race categories exclude persons of Hispanic ethnicity. Data exclude children living in institutions (e.g., prisons or nursing facilities). Although rounded numbers are displayed, the figures are based on unrounded estimates.
SOURCE: U.S. Department of Commerce, Census Bureau, Current Population Survey (CPS), July 2015. See *Digest of Education Statistics 2016*, table 702.20.

Compared to internet use at home, different patterns by child and family characteristics were also observed for children's internet use at a library, community center, or other public place. For instance, among children who used the Internet anywhere in 2015, the percentage using the Internet at a library, community center, or other public place was higher for children who were Pacific Islander (46 percent), of Two or more races (34 percent), Black (34 percent), Asian (32 percent), and Hispanic (29 percent) than for White children (23 percent); and it was higher for Black children than for Hispanic children. In addition, the percentage of children who used the Internet at a library, community center, or other public place was generally higher for children with lower family incomes than for those with higher family incomes: Among children who used the Internet anywhere, 33 percent of children with a family income between $10,000 and $19,999 and 32 percent of children with a family income of less than $10,000 used the Internet at a library, community center, or other public place, while 26 percent of children with a family income of $100,000 or more and 25 percent of children with a family income between $75,000 and $99,999 did so.

Figure 3.5. Among children ages 3 to 18 who use the Internet anywhere, percentage using it at someone else's home, by selected child and family characteristics: 2015



See notes on next page.

! Interpret data with caution. The coefficient of variation (CV) for this estimate is between 30 and 50 percent.
[1] Children living in areas whose metropolitan status was not identified are excluded from this figure. In 2015, less than 1 percent of children ages 3 to 18 lived in an area with nonidentified metropolitan status.
[2] Refers to metropolitan statistical areas, which contain at least one urbanized area with a population of 50,000 or more.
[3] Refers to areas that are outside of metropolitan statistical areas.
[4] Highest education level of any parent residing with the child (including an adoptive or stepparent). Includes only children who resided with at least one of their parents.
NOTE: Family income shown in current dollars. Race categories exclude persons of Hispanic ethnicity. Data exclude children living in institutions (e.g., prisons or nursing facilities). Although rounded numbers are displayed, the figures are based on unrounded estimates.
SOURCE: U.S. Department of Commerce, Census Bureau, Current Population Survey (CPS), July 2015. See *Digest of Education Statistics 2016*, table 702.20.

With respect to children's internet use at someone else's home, differences existed across some of the child and family characteristics examined. Among children who used the Internet anywhere in 2015, a higher percentage of White children (34 percent) than of Black (28 percent), Asian (28 percent), and Hispanic children (25 percent) used the Internet at someone else's home. The percentage was also higher for children of Two or more races (34 percent) and Black children than for Hispanic children. The percentage of children using the Internet at someone else's home was higher for children in metropolitan areas (31 percent) than for those in nonmetropolitan areas (28 percent); and it was generally higher for older children and children whose parents had higher levels of educational attainment.

Reference tables: Table 3.1.

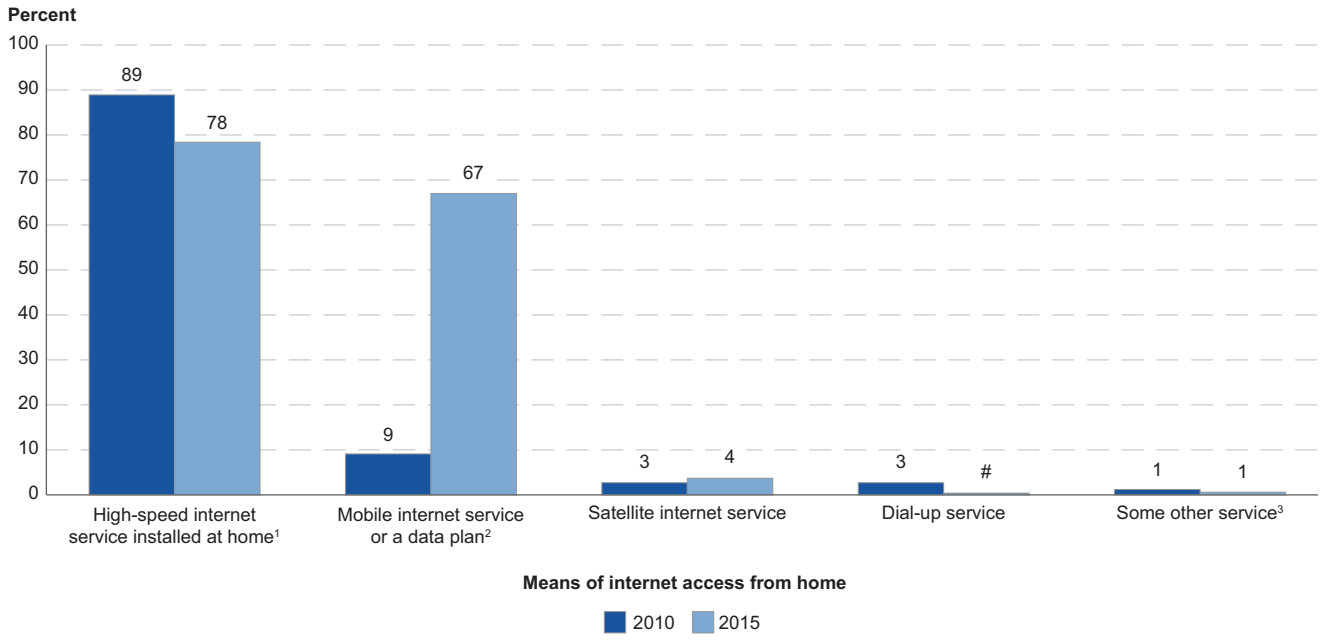
Indicator 4

Means of Internet Access at Home

In 2015, about 78 percent of children ages 3 to 18 who used the Internet at home accessed it through a high-speed internet service installed at home; this percentage was lower than the corresponding percentage in 2010 (89 percent). In contrast, a higher percentage of children who used the Internet at home accessed it through a mobile internet service or data plan in 2015 (67 percent) than in 2010 (9 percent).

This indicator uses the Current Population Survey to examine the prevalence of different means of internet access at home in 2015 and 2010 for children ages 3 to 18 who used the Internet at home.[1] The indicator then focuses on the percentages of the children who accessed the Internet through a high-speed internet service installed at home or by a mobile internet service or a data plan in 2015, describing differences in relation to race/ethnicity, age, highest level of education attained by either parent, and family income.

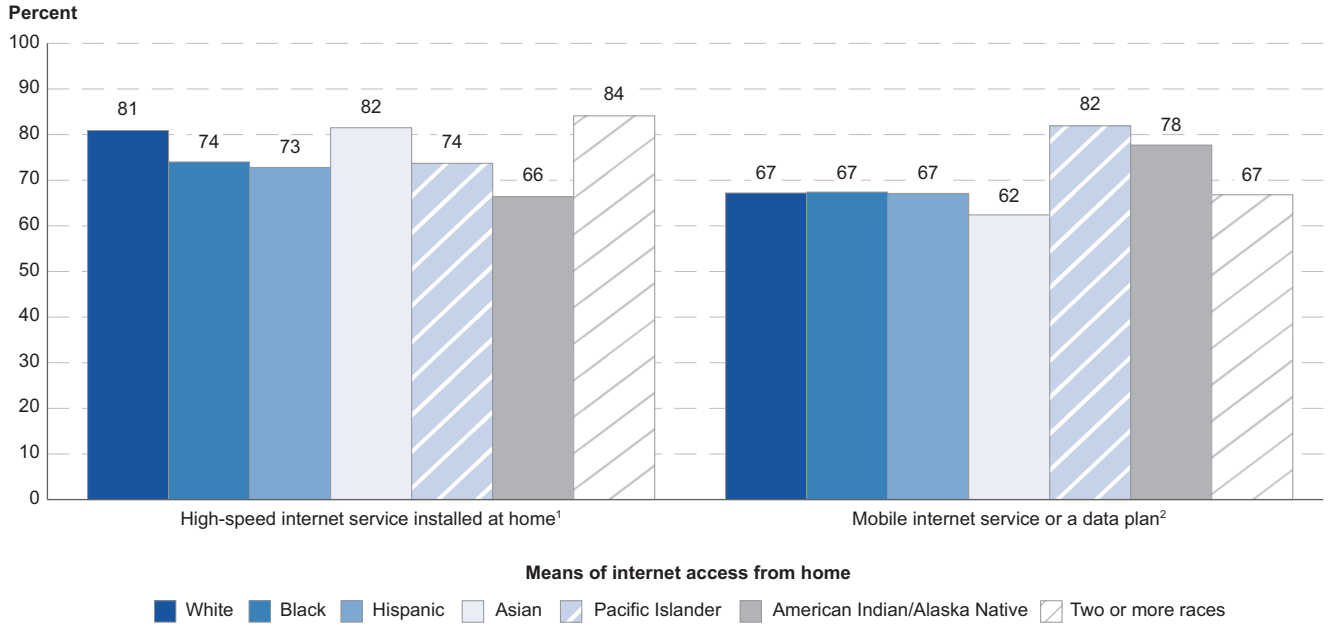
Figure 4.1. Percentage of children ages 3 to 18 who used the Internet at home, by means of internet access from home: 2010 and 2015



Rounds to zero.
[1] Includes cable, DSL, and fiber-optic service.
[2] Includes data plan for a cellular phone, smartphone, tablet, laptop, or other device.
[3] Respondents were asked whether they accessed the Internet at home using "some other service." Examples of other services were not provided to respondents.
NOTE: Includes only persons who use the Internet from home. The different types of internet access may sum to more than 100 percent because a single home internet user can have more than one type of access (e.g., high-speed internet service plus a mobile phone data plan). Data are based on sample surveys of the civilian noninstitutionalized population, which excludes persons in the military and persons living in institutions (e.g., prisons or nursing facilities). Data for 2015 were collected in the July supplement to the Current Population Survey (CPS), while data for 2010 were collected in the October supplement. The July supplement consists solely of questions about computer and internet use. In contrast, the October supplement focuses on school enrollment, although it also includes questions about computer and internet use. Measurable differences in estimates across years could reflect actual changes in the population; however, differences could also reflect seasonal variations in data collection or differences between the content of the July and October supplements. Therefore, caution should be used when making year-to-year comparisons. Although rounded numbers are displayed, the figures are based on unrounded estimates.
SOURCE: U.S. Department of Commerce, Census Bureau, Current Population Survey (CPS), October 2010 and July 2015. See *Digest of Education Statistics 2016*, table 702.35.

Children had different types of internet access at home.[2] In 2015, the two most common means of internet access for children ages 3 to 18 who used the Internet at home were a high-speed internet service installed at home, including cable, DSL, and fiber-optic service (78 percent) and a mobile internet service or a data plan, including a data plan for a cellular phone, smartphone, tablet, laptop, or other device (67 percent). Other means of internet access were satellite internet service (4 percent), dial-up service (less than 1 percent), or some other service[3] (1 percent). In addition, the percentage of children whose means of home internet access was a mobile internet service or a data plan was higher in 2015 (67 percent) than 2010 (9 percent), while the percentage of children who accessed the Internet through a high-speed internet service installed at home was lower in 2015 (78 percent) than 2010 (89 percent).

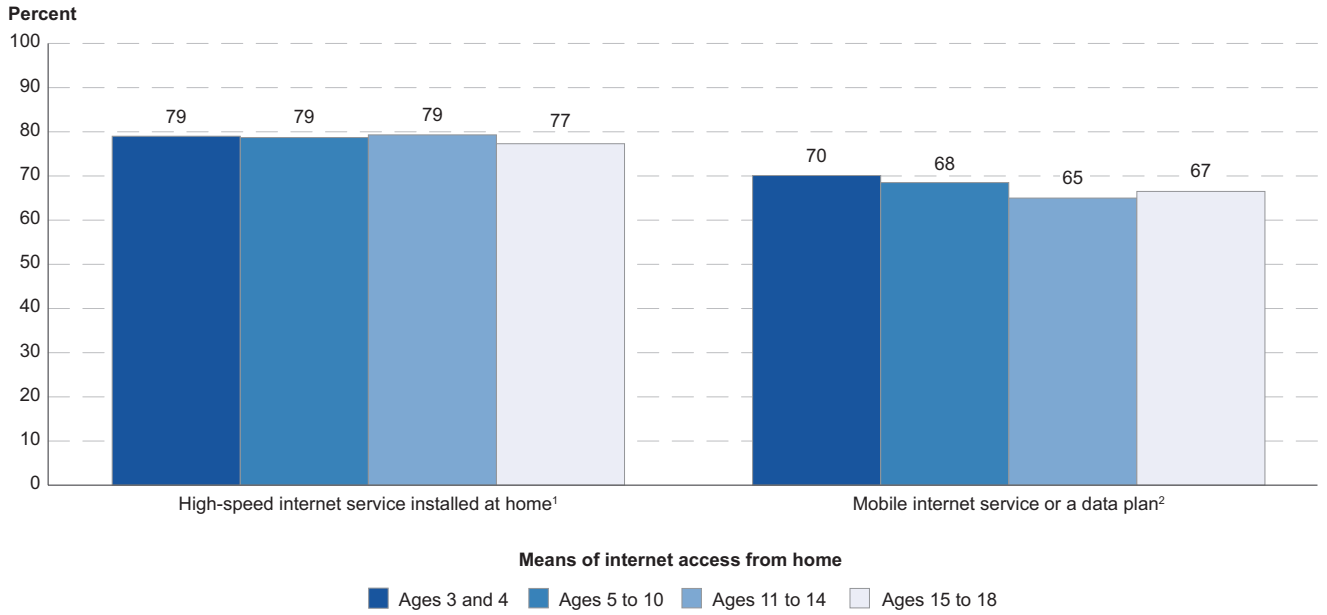
Figure 4.2. Percentage of children ages 3 to 18 using the Internet at home through a high-speed internet service installed at home or a mobile internet service or a data plan, by race/ethnicity: 2015



[1] Includes cable, DSL, and fiber-optic service.
[2] Includes data plan for a cellular phone, smartphone, tablet, laptop, or other device.
NOTE: Includes only persons who use the Internet from home. The different types of internet access may sum to more than 100 percent because a single home internet user can have more than one type of access (e.g., high-speed internet service plus a mobile phone data plan). Data are based on sample surveys of the civilian noninstitutionalized population, which excludes persons in the military and persons living in institutions (e.g., prisons or nursing facilities). Race categories exclude persons of Hispanic ethnicity. Although rounded numbers are displayed, the figures are based on unrounded estimates.
SOURCE: U.S. Department of Commerce, Census Bureau, Current Population Survey (CPS), July 2015. See *Digest of Education Statistics 2016*, table 702.35.

In 2015, the percentage of children ages 3 to 18 using the Internet at home who accessed it through a high-speed internet service installed at home was higher for children of Two or more races (84 percent), Asian children (82 percent), and White children (81 percent) than it was for Black (74 percent), Hispanic (73 percent), and American Indian/Alaska Native (66 percent) children. The percentages of children who accessed the Internet at home via a mobile internet service or a data plan presented a different pattern. A higher percentage of Pacific Islander children accessed the Internet through a mobile internet service or a data plan (82 percent) than Black children (67 percent), White children (67 percent), Hispanic children (67 percent), children of Two or more races (67 percent), and Asian children (62 percent). In addition, a higher percentage of American Indian/Alaska Native children (78 percent) than of Asian children accessed the Internet at home through a mobile internet service or a data plan.

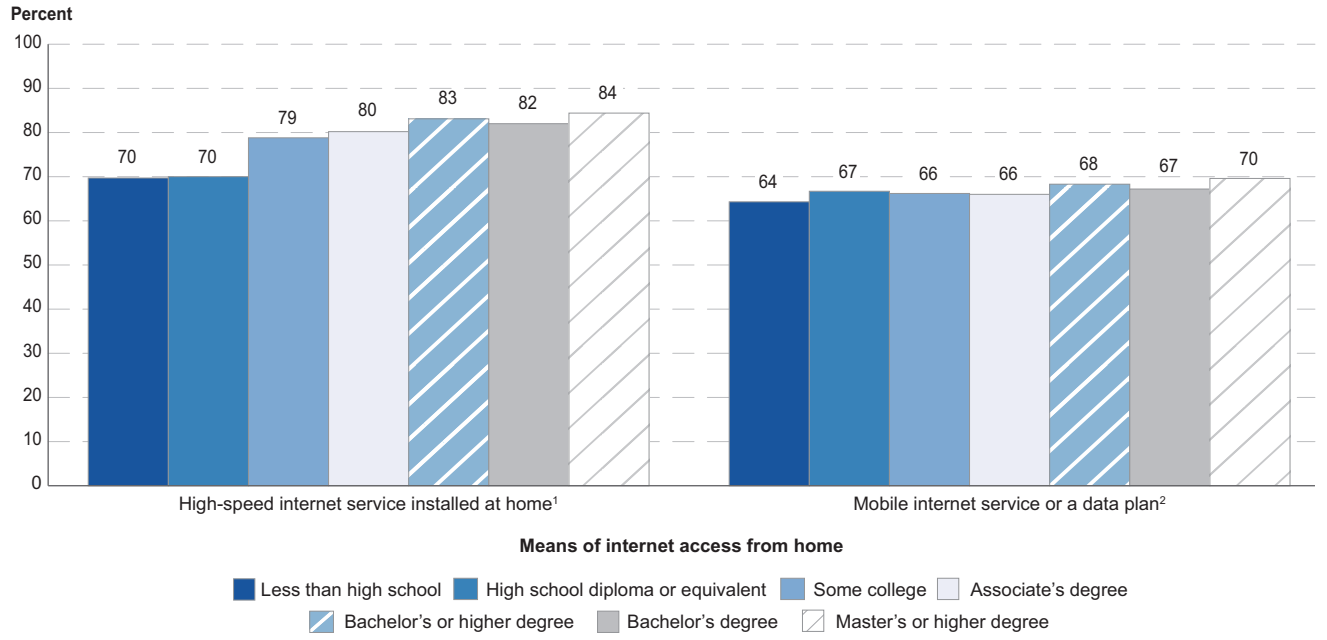
Figure 4.3. Percentage of children ages 3 to 18 using the Internet at home through a high-speed internet service installed at home or a mobile internet service or a data plan, by age: 2015



[1] Includes cable, DSL, and fiber-optic service.
[2] Includes data plan for a cellular phone, smartphone, tablet, laptop, or other device.
NOTE: Includes only persons who use the Internet from home. The different types of internet access may sum to more than 100 percent because a single home internet user can have more than one type of access (e.g., high-speed internet service plus a mobile phone data plan). Data are based on sample surveys of the civilian noninstitutionalized population, which excludes persons in the military and persons living in institutions (e.g., prisons or nursing facilities). Although rounded numbers are displayed, the figures are based on unrounded estimates.
SOURCE: U.S. Department of Commerce, Census Bureau, Current Population Survey (CPS), July 2015. See *Digest of Education Statistics 2016*, table 702.35.

No measurable differences were observed across age groups in the percentage of children ages 3 to 18 using the Internet at home who accessed it through a high-speed internet service installed at home in 2015. However, in the same year, a higher percentage of children ages 3 and 4 (70 percent) than of ages 11 to 14 (65 percent) and 15 to 18 (67 percent) accessed the Internet at home through a mobile internet service or a data plan. In addition, the percentage of children ages 5 to 10 (68 percent) who accessed the Internet at home through a mobile internet service or a data plan was higher than the corresponding percentage of children ages 11 to 14.

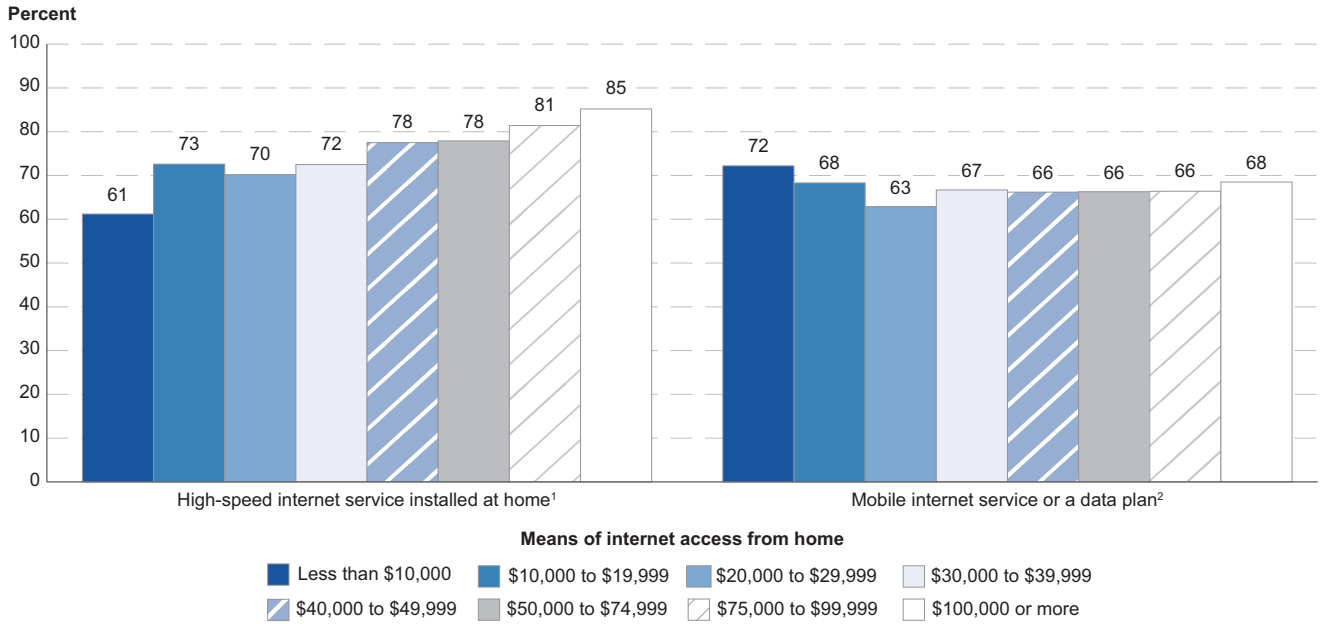
Figure 4.4. Percentage of children ages 3 to 18 using the Internet at home through a high-speed internet service installed at home or a mobile internet service or a data plan, by highest level of education attained by either parent: 2015



[1] Includes cable, DSL, and fiber-optic service.
[2] Includes data plan for a cellular phone, smartphone, tablet, laptop, or other device.
NOTE: Includes only persons who use the Internet from home. The different types of internet access may sum to more than 100 percent because a single home internet user can have more than one type of access (e.g., high-speed internet service plus a mobile phone data plan). Data are based on sample surveys of the civilian noninstitutionalized population, which excludes persons in the military and persons living in institutions (e.g., prisons or nursing facilities). Highest education level refers to that of any parent residing with the child (including an adoptive or stepparent). Includes only children who resided with at least one of their parents. Although rounded numbers are displayed, the figures are based on unrounded estimates.
SOURCE: U.S. Department of Commerce, Census Bureau, Current Population Survey (CPS), July 2015. See *Digest of Education Statistics 2016*, table 702.35.

In 2015, the percentages of children ages 3 to 18 who accessed the Internet through a high-speed internet service installed at home were higher for those whose parents attained a bachelor's or higher degree (83 percent), an associate's degree (80 percent), and some college education (79 percent) than for those whose parents did not complete high school and those whose parents only completed high school (70 percent each). In addition, a lower percentage of children whose parents attained some college education than of those whose parents attained a bachelor's or higher degree accessed the Internet at home through a high-speed internet service. In contrast, no measurable differences were observed for the percentage of children who accessed the Internet through a mobile internet service or a data plan in relation to their parents' educational attainment.

Figure 4.5. Percentage of children ages 3 to 18 using the Internet at home through a high-speed internet service installed at home or a mobile internet service or a data plan, by family income: 2015



[1] Includes cable, DSL, and fiber-optic service.
[2] Includes data plan for a cellular phone, smartphone, tablet, laptop, or other device.
NOTE: Family income shown in current dollars. Includes only persons who use the Internet from home. The different types of internet access may sum to more than 100 percent because a single home internet user can have more than one type of access (e.g., high-speed internet service plus a mobile phone data plan). Data are based on sample surveys of the civilian noninstitutionalized population, which excludes persons in the military and persons living in institutions (e.g., prisons or nursing facilities). Although rounded numbers are displayed, the figures are based on unrounded estimates.
SOURCE: U.S. Department of Commerce, Census Bureau, Current Population Survey (CPS), July 2015. See *Digest of Education Statistics 2016*, table 702.35.

The percentage of children ages 3 to 18 using the Internet at home who accessed it through a high-speed internet service installed at home in 2015 was lowest for children with family incomes of less than $10,000 (61 percent) and highest for children with family incomes over $100,000 (85 percent). In addition, lower percentages of children with family incomes of $10,000 to $19,999 (73 percent), $30,000 to $39,999 (72 percent), and $20,000 to $29,999 (70 percent) than those with family incomes between $75,000 and $99,999 (81 percent) accessed the Internet through a high-speed internet service installed at home.

Few differences and no consistent patterns were observed across family income levels in the percentages of children ages 3 to 18 using the Internet at home through a mobile internet service or a data plan. Specifically, 72 percent of children with family incomes less than $10,000 accessed the Internet through a mobile internet service or a data plan, compared with 66 percent of those with family incomes of $50,000 to $74,999 and 63 percent of those with a family income of $20,000 to $29,999. In addition, the percentage of children with family incomes of $20,000 to $29,999 who accessed the Internet at home through a mobile internet service or a data plan (63 percent) was lower than that of children with family incomes of over $100,000 (68 percent).

Endnotes:

[1] Data for 2015 were collected in the July supplement to the Current Population Survey (CPS), while data for 2010 were collected in the October supplement. The July supplement consists solely of questions about computer and internet use. In contrast, the October supplement focuses on school enrollment, although it also includes questions about computer and internet use. Measurable differences in estimates across years could reflect actual changes in the population; however, differences could also reflect seasonal variations in data collection or differences between the content of the July and October supplements. Therefore, caution should be used when making year-to-year comparisons. Percentages for means of internet access at home are only based on persons who use the Internet at home.

[2] The different types of internet access may sum to more than 100 percent because a single home internet user can have more than one type of access (e.g., high-speed internet service plus a mobile phone data plan).

[3] Respondents were asked whether they accessed the Internet at home using "some other service." Examples of other service were not provided to respondents.

Reference tables: Table 4.1.

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Indicator 5

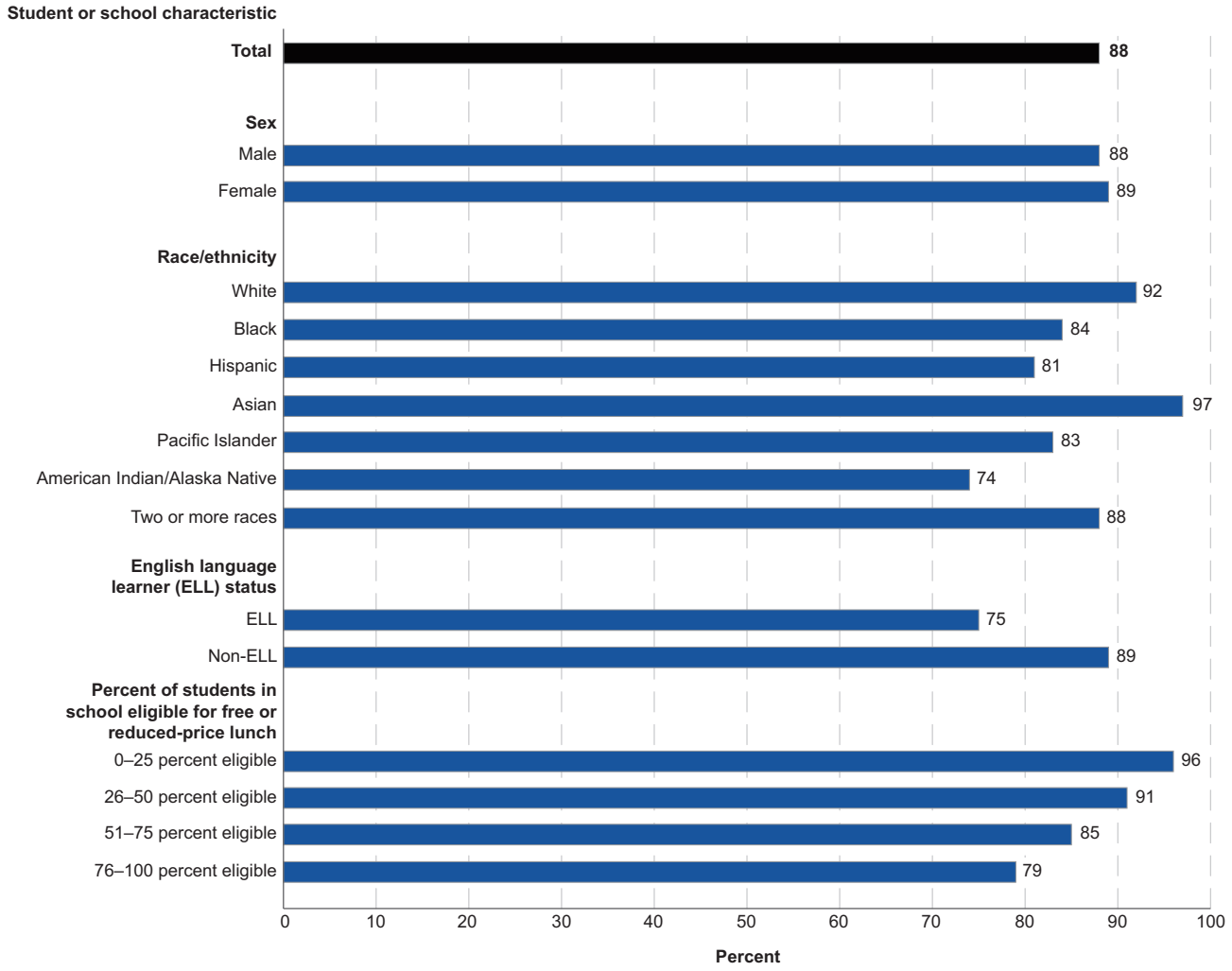
Student Computer Use and Internet Access at Home

In 2015, some 88 percent of 8th-grade students reported that they used a computer at home, and 92 percent reported that they had access to the Internet at home. For 4th-grade students, the percentage who reported using a computer at home and the percentage who reported having access to the Internet at home were both 83 percent.

Using data collected in the National Assessment of Educational Progress (NAEP) reading administration, this indicator describes differences in students' computer use and internet access at home, with respect to student and school characteristics. NAEP assesses student performance in reading at grades 4, 8, and 12 in both public and private schools across the nation.[1] In addition to administering the assessment, NAEP includes a student questionnaire to provide context for student performance. The NAEP student questionnaire includes questions on demographics, as well as questions about students' use of computers and the Internet in their homes.[2] Information in this indicator serves as context for later indicators in the chapter, which focus on associations between computer use/internet access at home and children's performance on the NAEP reading, mathematics, science, and information and communication technology (ICT) assessments.

Among 8th-grade students, 88 percent reported that they used a computer at home, and 92 percent reported that they had access to the Internet at home in 2015. For 4th-grade students, the percentage who reported using a computer at home and the percentage of students having access to the Internet at home were both 83 percent.

Figure 5.1. Percentage of 8th-graders who reported using a computer at home, by selected student and school characteristics: 2015

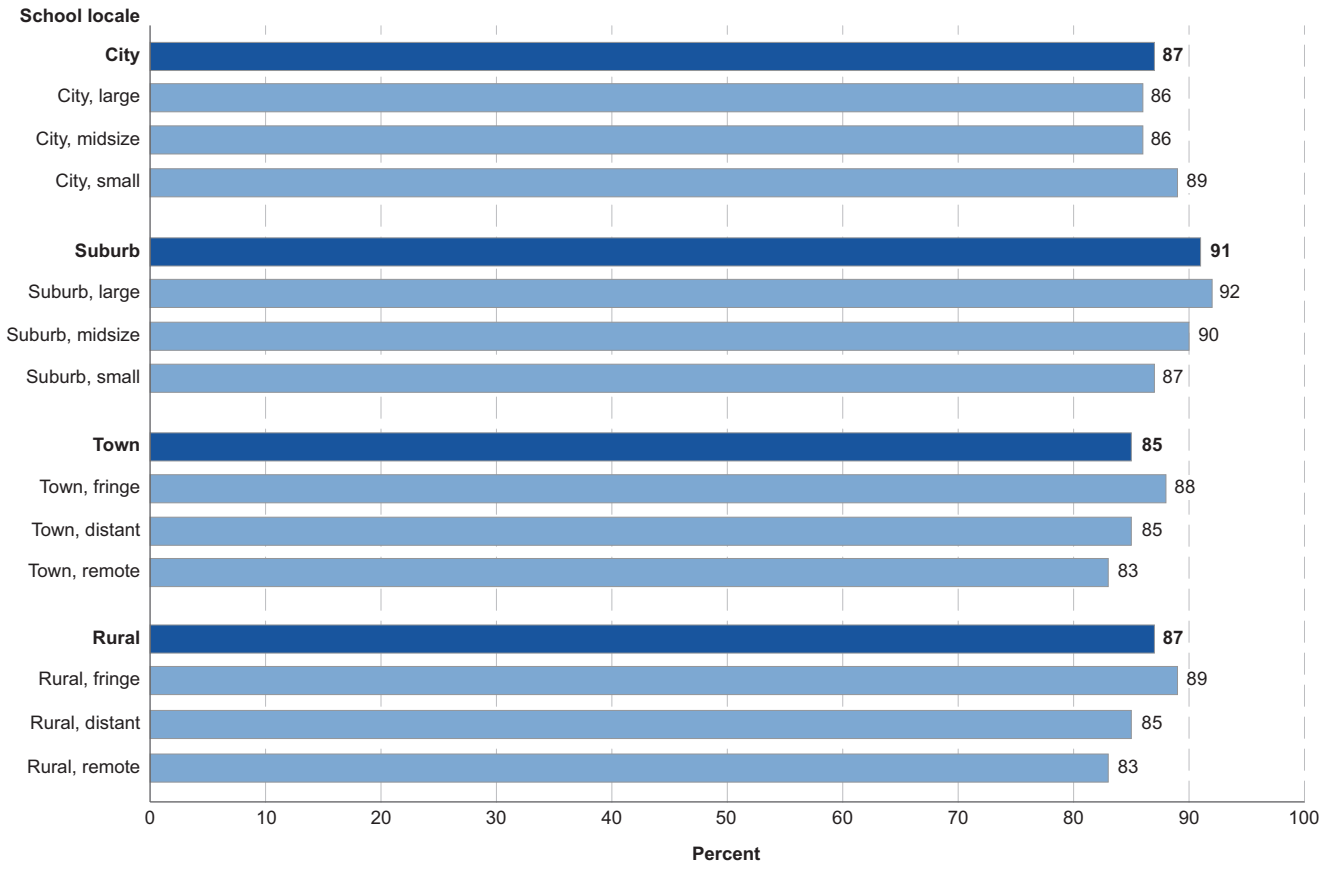


NOTE: Includes students tested in reading with accommodations (11 percent of all 8th-graders); excludes only those students with disabilities and English language learners who were unable to be tested even with accommodations (2 percent of all 8th-graders). Race categories exclude persons of Hispanic ethnicity.
SOURCE: U.S. Department of Education, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2015 Reading Assessment, NAEP Data Explorer. See *Digest of Education Statistics 2016*, table 221.35.

At both grade 4 and grade 8, the percentages of students who reported using a computer at home and the percentages of students who reported having access to the Internet at home varied by student and school characteristics in 2015. Regarding home computer use, for example, the percentage of 8th-grade students who reported that they used a computer at home was highest for Asian students (97 percent) and lowest for American Indian/Alaska Native students (74 percent). The percentage was also higher for White students (92 percent) than for students of Two or more races (88 percent), Black students (84 percent), Pacific Islander students (83 percent), and Hispanic students (81 percent). The percentage of 8th-grade students who used a computer at home was higher for female students (89 percent) than for male students (88 percent). The percentage of 8th-grade students who used a computer at home was also higher for non-English language learners (ELL) (89 percent) than for ELL students (75 percent). In addition, the percentage of 8th-grade students who used a computer at home was highest for students in low-poverty schools (96 percent) and lowest for students in high-poverty schools (79 percent).[3] Similar patterns of differences were observed at grade 4. For example, the percentage of 4th-grade students who reported that they used a computer at home was

highest for Asian students (92 percent) and lowest for American Indian/Alaska Native students (72 percent). The percentage was also higher for White students (87 percent) than for students of Two or more races (85 percent), Black students and Pacific Islander students (80 percent each), and Hispanic students (77 percent).

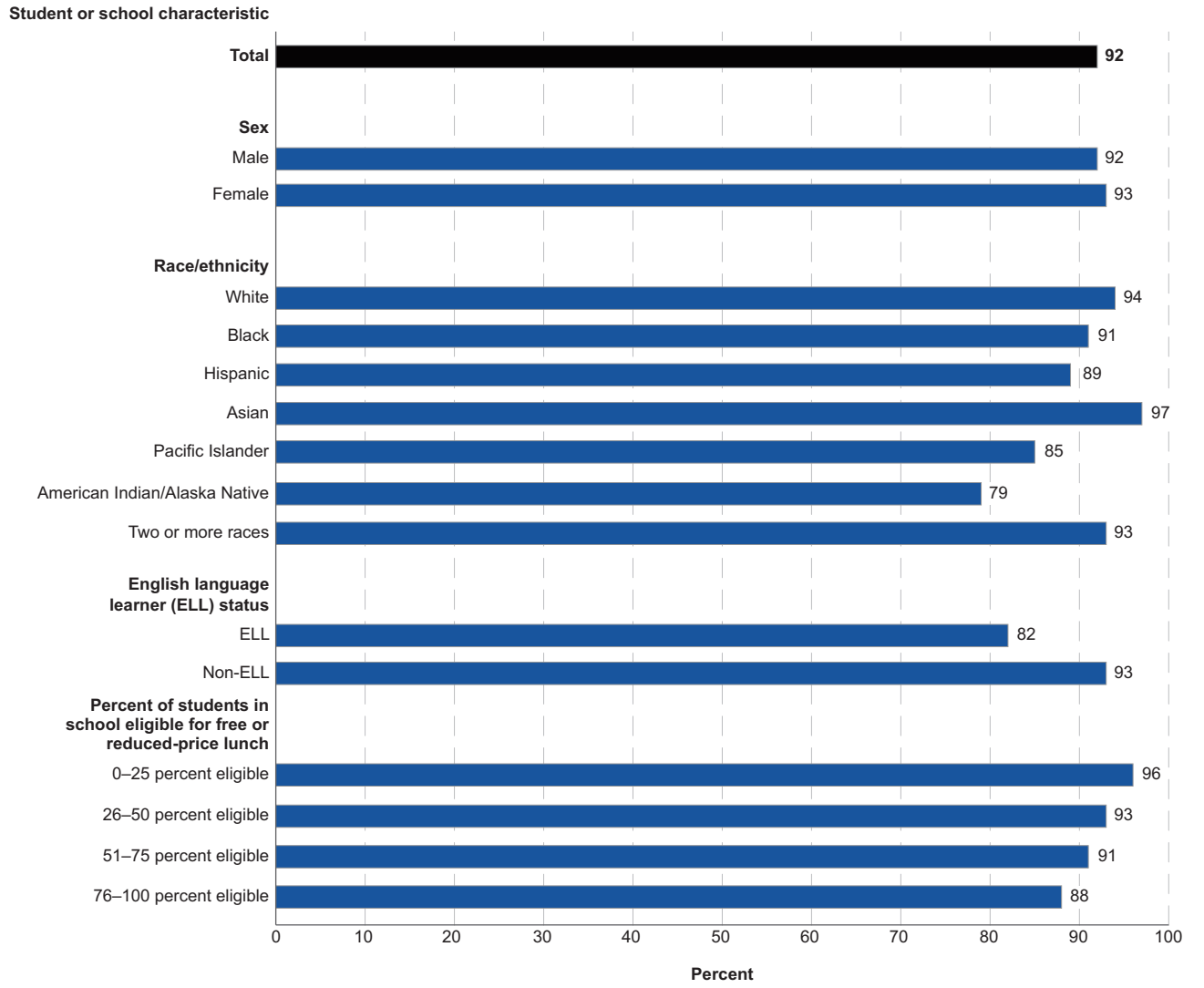
Figure 5.2. Percentage of 8th-graders who reported using a computer at home, by school locale: 2015



NOTE: Includes students tested in reading with accommodations (11 percent of all 8th-graders); excludes only those students with disabilities and English language learners who were unable to be tested even with accommodations (2 percent of all 8th-graders).
SOURCE: U.S. Department of Education, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2015 Reading Assessment, NAEP Data Explorer. See *Digest of Education Statistics 2016*, table 221.35.

The percentage of students who reported using a computer at home also varied according to the locale in which their school was situated (i.e., located in a city, suburb, town, or rural area). For both 4th-grade and 8th-grade students in 2015, the percentage was highest for students in suburban schools, followed by students in city and rural schools, and lowest for students in town schools. The percentage of 8th-grade students who reported that they used a computer at home was lower for students in schools located in remote towns and remote rural areas (83 percent each) than for those in large suburbs (92 percent), midsize suburbs (90 percent), small cities and fringe rural areas (89 percent each), fringe towns (88 percent), and large cities (86 percent). The percentage of 8th-grade students who reported that they used a computer at home was also lower for students in schools located in distant towns and distant rural areas (85 percent each) than for those in large suburbs, midsize suburbs, small cities, fringe rural areas, and fringe towns.

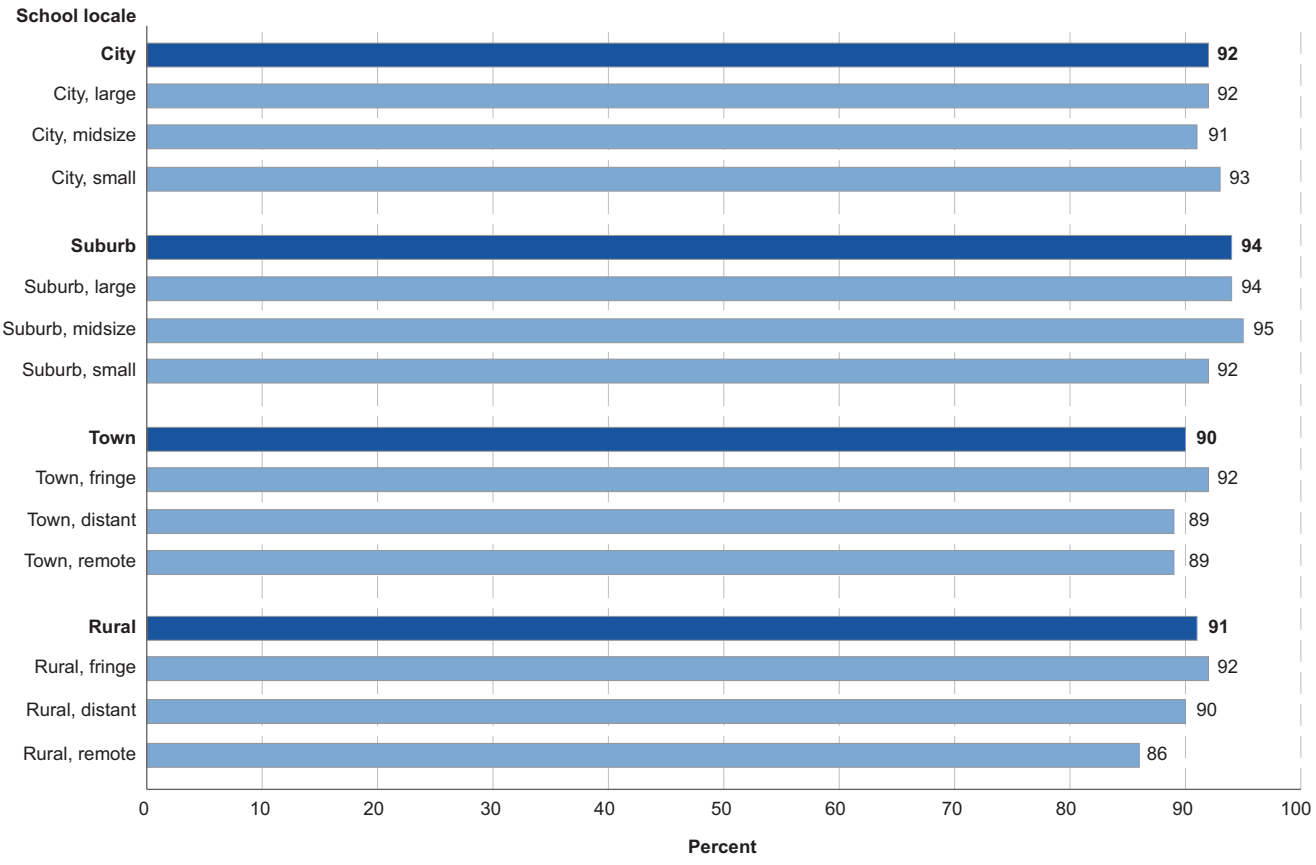
Figure 5.3. Percentage of 8th-graders who reported having access to the Internet at home, by selected student and school characteristics: 2015



NOTE: "Access to the Internet" was one item on a list preceded by the question "Do you have the following in your home?" For each item, students could either select "Yes" or leave the item blank. Students who left "Access to the Internet" blank are counted as having no internet access at home. Includes students tested in reading with accommodations (11 percent of all 8th-graders); excludes only those students with disabilities and English language learners who were unable to be tested even with accommodations (2 percent of all 8th-graders). Race categories exclude persons of Hispanic ethnicity.
SOURCE: U.S. Department of Education, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2015 Reading Assessment, NAEP Data Explorer. See *Digest of Education Statistics 2016*, table 221.35.

The percentage of students who reported having access to the Internet at home also varied by student and school characteristics in 2015. Most differences were observed at both grade 4 and grade 8, with patterns similar to those observed for home computer use. For example, at both grades, the percentages of students having access to the Internet at home were highest for Asian students and lowest for American Indian/Alaska Native students; and the percentage was also higher for non-ELL students than for ELL students. In addition, the percentage was highest for students in low-poverty schools and lowest for students in high-poverty schools. The only exception is that in 8th grade, the percentage of students having access to the Internet at home was higher for female students (93 percent) than for male students (92 percent); while in 4th grade, the percentage was not measurably different by sex (83 percent for both males and females).

Figure 5.4. Percentage of 8th-graders who reported having access to the Internet at home, by school locale: 2015



NOTE: "Access to the Internet" was one item on a list preceded by the question "Do you have the following in your home?" For each item, students could either select "Yes" or leave the item blank. Students who left "Access to the Internet" blank are counted as having no internet access at home. Includes students tested in reading with accommodations (11 percent of all 8th-graders); excludes only those students with disabilities and English language learners who were unable to be tested even with accommodations (2 percent of all 8th-graders).
SOURCE: U.S. Department of Education, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2015 Reading Assessment, NAEP Data Explorer. See *Digest of Education Statistics 2016*, table 221.35.

As with the percentage of students who reported using a computer at home, the percentage of students who reported having access to the Internet at home also varied by school locale in 2015. In 8th grade, the percentage was highest for students in suburban schools (94 percent), followed by students in city schools (92 percent), and lowest for students in rural and town schools (91 and 90 percent, respectively). In 4th grade, the percentage was highest for students in suburban schools (85 percent), followed by students in rural and city schools (82 and 81 percent, respectively), and lowest for students in town schools (78 percent). The percentage of 8th-grade students who reported having access to the Internet at home was lowest for students in schools located in remote rural areas (86 percent). The percentage of 8th-grade students who reported having access to the Internet at home was also lower for students in schools located in distant towns and remote towns (89 percent each) than for those in midsize suburbs (95 percent), large suburbs (94 percent), small cities (93 percent), large cities (92 percent), small suburbs (92 percent), fringe rural areas (92 percent), fringe towns (92 percent) and midsize cities (91 percent).

Endnotes:

[1] The results for grade 8 students are shown in the figures. The results for grade 4 students are available in reference tables cited at the end of the indicator.
[2] Information in this indicator comes from data collected through the NAEP questionnaire administered to students participating in the 2015 NAEP reading assessment
[3] Low-poverty schools are those with 0–25 percent of students eligible for free or reduced-price lunch, and high-poverty schools are those with 76–100 percent of students eligible for free or reduced-price lunch. For more discussions on using free or reduced-price lunch data as a proxy for poverty, see the NCES blog "Free or reduced price lunch: A proxy for poverty?" (http://nces.ed.gov/blogs/nces/post/free-or-reduced-price-lunch-a-proxy-for-poverty).

Reference tables: Table 5.1.

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Indicator 6

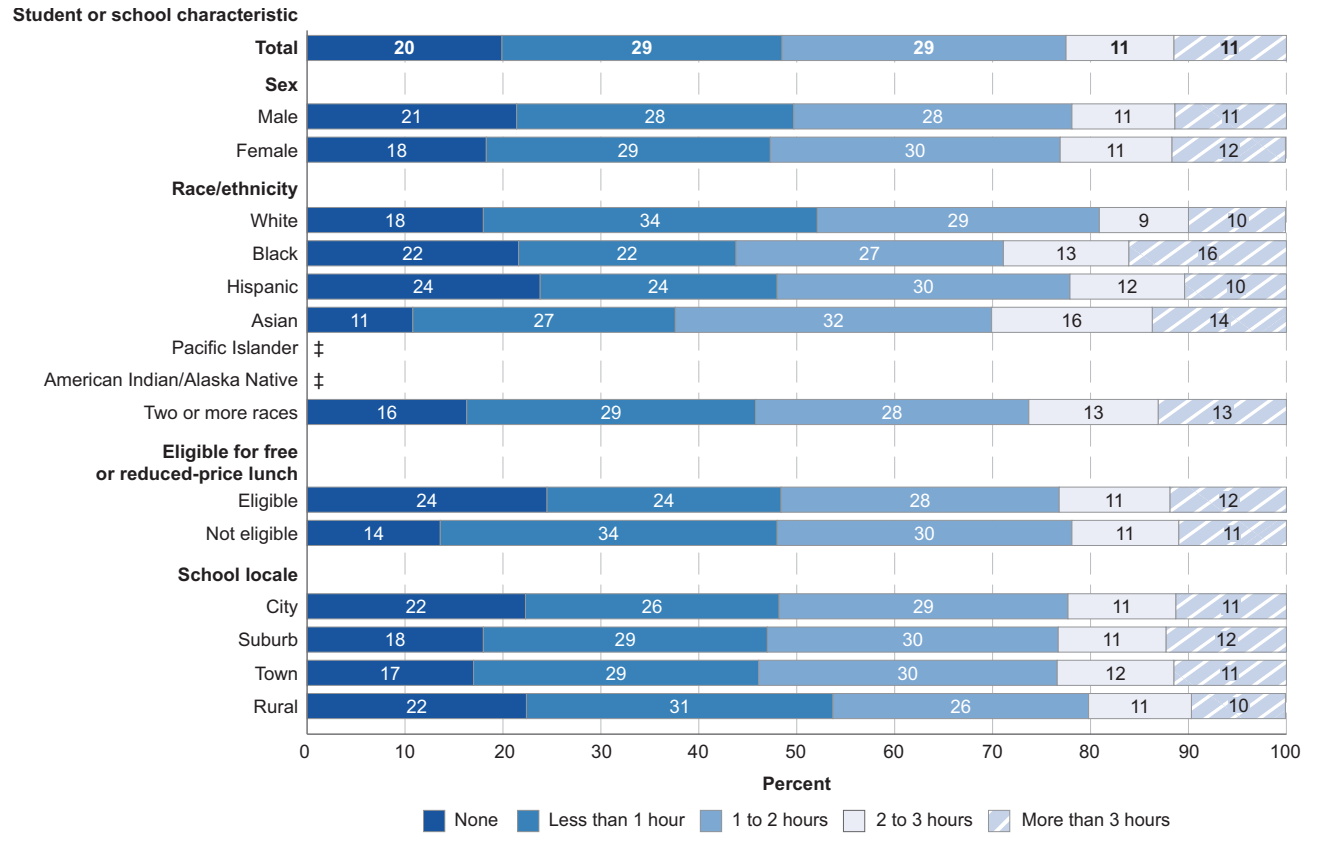
Computer Use for Schoolwork

In 2015, about 20 percent of 8th-grade public school students reported not using a computer for schoolwork on a weekday, 29 percent reported using a computer for less than 1 hour, 29 percent reported using a computer for 1 to 2 hours, 11 percent reported using a computer for 2 to 3 hours, and 11 percent reported using a computer for more than 3 hours.

The Computer Access and Familiarity Study (CAFS) was designed to measure student access to and familiarity with technology. The CAFS was conducted as part of the 2015 National Assessment of Educational Progress (NAEP) and administered to public school students in grades 4, 8, and 12.[1]

This indicator uses the CAFS to examine the status and the number of hours that 8th-grade public school students reported using a laptop or desktop computer anywhere for schoolwork on a weekday, by selected student or school characteristics. In 2015, about 20 percent of 8th-grade public school students reported not using a computer for schoolwork on a weekday, 29 percent reported using a computer for less than 1 hour, 29 percent reported using a computer for 1 to 2 hours, 11 percent reported using a computer for 2 to 3 hours, and 11 percent reported using a computer for more than 3 hours.

Figure 6.1. Percentage distribution of 8th-grade public school students, by number of hours they spend using a laptop or desktop computer for schoolwork on a weekday and selected student and school characteristics: 2015



‡ Reporting standards not met (too few cases for a reliable estimate).
NOTE: Race categories exclude persons of Hispanic ethnicity. Detail may not sum to totals because of rounding.
SOURCE: American Institutes for Research, National Assessment of Educational Progress (NAEP) Validity Studies Panel, *Initial Tables From the 2015 Computer Access and Familiarity Study*. See *Digest of Education Statistics 2016*, table 218.50.

Among 8th-grade public school students in 2015 who reported not using a laptop or desktop computer for schoolwork on a weekday, differences were found by student sex, race/ethnicity, disability status, eligibility for free or reduced-price lunch (FRPL), and school locale. A higher percentage of 8th-grade males (21 percent) than females (18 percent) reported not using a computer for schoolwork on a weekday. The percentages of 8th-grade students who reported not using a computer were higher for Hispanic (24 percent) and Black students (22 percent) than for White (18 percent) and Asian students (11 percent). In addition, the percentage of White students who reported not using a computer was higher than the percentage for Asian students. The percentage of 8th-grade students who reported not using a computer for schoolwork was higher for students with a disability (25 percent) than for students without a disability (19 percent).

In addition, a higher percentage of students eligible for FRPL (24 percent) reported not using a computer for schoolwork than did students not eligible for FRPL (14 percent). The percentage of students who reported not using a computer for schoolwork also varied based on the locale in which their school was situated (i.e., located in a city, suburb, town, or rural area). A higher percentage of 8th-grade students in rural and city (22 percent each) than in suburban (18 percent) and town schools (17 percent) reported not using a computer for schoolwork.

Among 8th-grade public school students who reported using a laptop or desktop computer for schoolwork on a weekday for 1 to 2 hours in 2015, differences were only found by student disability status and school locale. The percentage of 8th-grade students who reported using a computer for schoolwork for 1 to 2 hours was higher for students without a disability (30 percent) than for students with a disability (24 percent). A higher percentage of 8th-grade students in suburban schools (30 percent) than in rural schools (26 percent) reported using a computer for schoolwork on a weekday for 1 to 2 hours.

Few measurable differences were found among 8th-grade public school students who reported using a laptop or desktop computer for schoolwork on a weekday for more than 3 hours. The percentage of 8th-grade students who reported using a computer for more than 3 hours was higher for Black students (16 percent) than for White and Hispanic students (10 percent each). A higher percentage of 8th-grade students in suburban schools (12 percent) than in rural schools (10 percent) reported using a computer for schoolwork on a weekday for more than 3 hours.

Endnotes:

[1] The results for grade 8 students are shown in the figures. The results for grade 4 students are available in reference tables cited at the end of the indicator.

Reference tables: Table 6.1.

Indicator 7

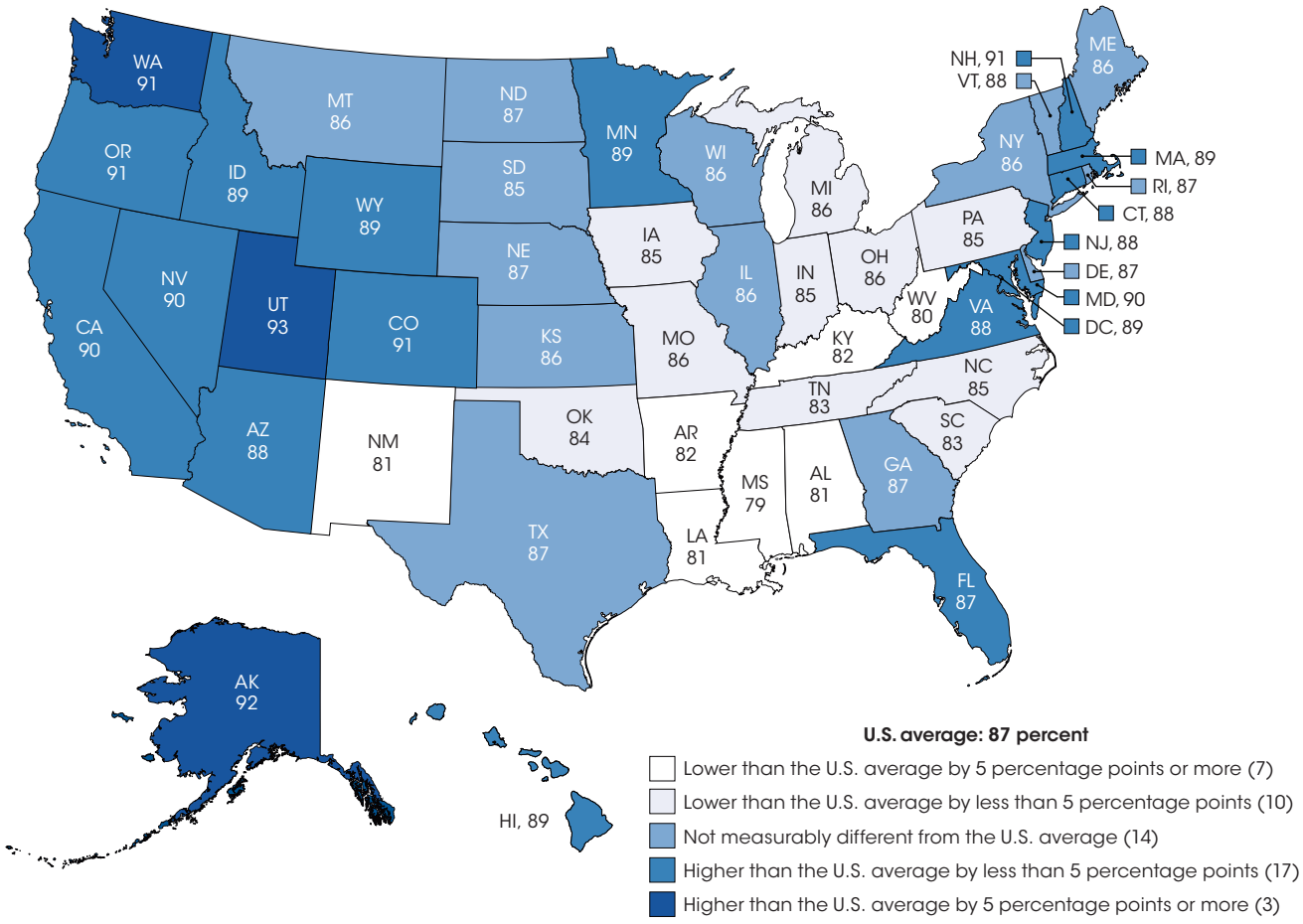
Household Computer and Internet Access by State

In 2015, about 87 percent of U.S. households owned or used a computer at home and 77 percent of U.S. households had access to the Internet. The percentage of households with computer access ranged from 79 percent in Mississippi to 93 percent in Utah. The percentage of households with internet access ranged from 62 percent in Mississippi to 85 percent each in New Hampshire and Washington.

The U.S. Census Bureau has asked questions in the Current Population Survey (CPS) about computer use since 1984 and internet access since 1997. Starting in 2013, the Census Bureau began including questions about computer and internet access in the American Community Survey (ACS). While these historical estimates from the CPS are presented in other indicators included earlier in this section, the inclusion of computer and internet questions in the ACS provides estimates at more detailed levels of geography. This indicator is different from other indicators presented in this report as it focuses on all U.S. households and not households with children.

This indicator uses the ACS to examine the percentage of U.S. households who own or use computers and the percentage of households with internet access by state. In 2015, about 87 percent of households owned or used a computer at home and 77 percent of households had internet access; however, household computer use and internet access varied across states. In this indicator, households with computer access include all households whose members own or use a desktop, laptop, netbook, or notebook computer; handheld computer, smart mobile phone, or other handheld wireless computer; or some other type of computer. Households with internet access include households whose members access the Internet with a subscription to an internet service.

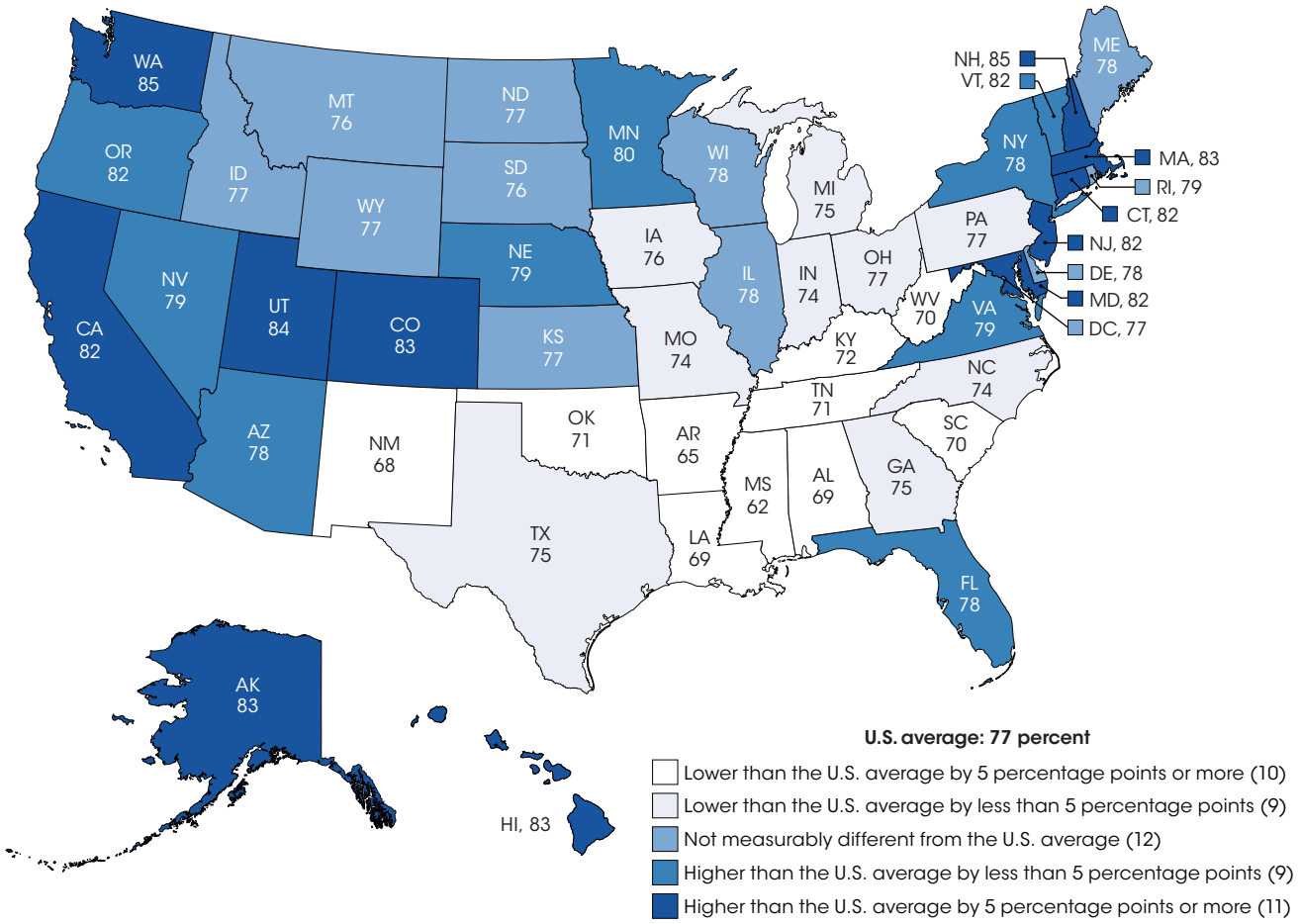
Figure 7.1. Percentage of households with computer access, by state: 2015



NOTE: Data in this figure are from the American Community Survey (ACS); estimates may differ from those shown in other sources obtained from the Current Population Survey (CPS). Data are based on sample surveys of the noninstitutionalized population living in households. Households exclude vacant units and institutionalized or noninstitutionalized group quarters. "Households with computer access" include all households whose members own or use a desktop, laptop, netbook, or notebook computer; handheld computer, smart mobile phone, or other handheld wireless computer; or some other type of computer.
SOURCE: U.S. Department of Commerce, Census Bureau, American Community Survey (ACS), 2015. See *Digest of Education Statistics 2016*, table 702.60.

In 2015, the percentage of households with computer access across the 50 states and the District of Columbia ranged from 79 percent in Mississippi to 93 percent in Utah. Nineteen states and the District of Columbia had higher percentages of household computer access than the national average (87 percent). Among these states, three were higher than the national average by 5 percentage points or more (Alaska, Utah, and Washington). Fourteen states had percentages that were not measurably different than the national average. Seventeen states had lower percentages of household computer access than the national average. Among these states, seven were lower than the national average by 5 percentage points or more (Alabama, Arkansas, Kentucky, Louisiana, Mississippi, New Mexico, and West Virginia).

Figure 7.2. Percentage of households with internet access, by state: 2015



NOTE: Data in this figure are from the American Community Survey (ACS); estimates may differ from those shown in other sources obtained from the Current Population Survey (CPS). Data are based on sample surveys of the noninstitutionalized population living in households. Households exclude vacant units and institutionalized or noninstitutionalized group quarters. "Households with internet access" include households whose members access the Internet with a subscription to an internet service. Households that reported home internet use without a subscription are not included.
SOURCE: U.S. Department of Commerce, Census Bureau, American Community Survey (ACS), 2015. See *Digest of Education Statistics 2016*, table 702.60.

Similarly, in 2015 the percentage of households with internet access ranged from 62 percent in Mississippi to 85 percent each in New Hampshire and Washington. Twenty states had higher percentages of household internet access than the national average (77 percent). Among these states, eleven were higher than the national average by 5 percentage points or more (Alaska, California, Colorado, Connecticut, Hawaii, Maryland, Massachusetts, New Hampshire, New Jersey, Utah, and Washington). Eleven states and the District of Columbia had percentages that were not measurably different than the national average. Nineteen states had lower percentages of household internet access than the national average. Among these states, ten were lower than the national average by 5 percentage points or more (Alabama, Arkansas, Kentucky, Louisiana, Mississippi, New Mexico, Oklahoma, South Carolina, Tennessee, and West Virginia).

Reference tables: Table 7.1.

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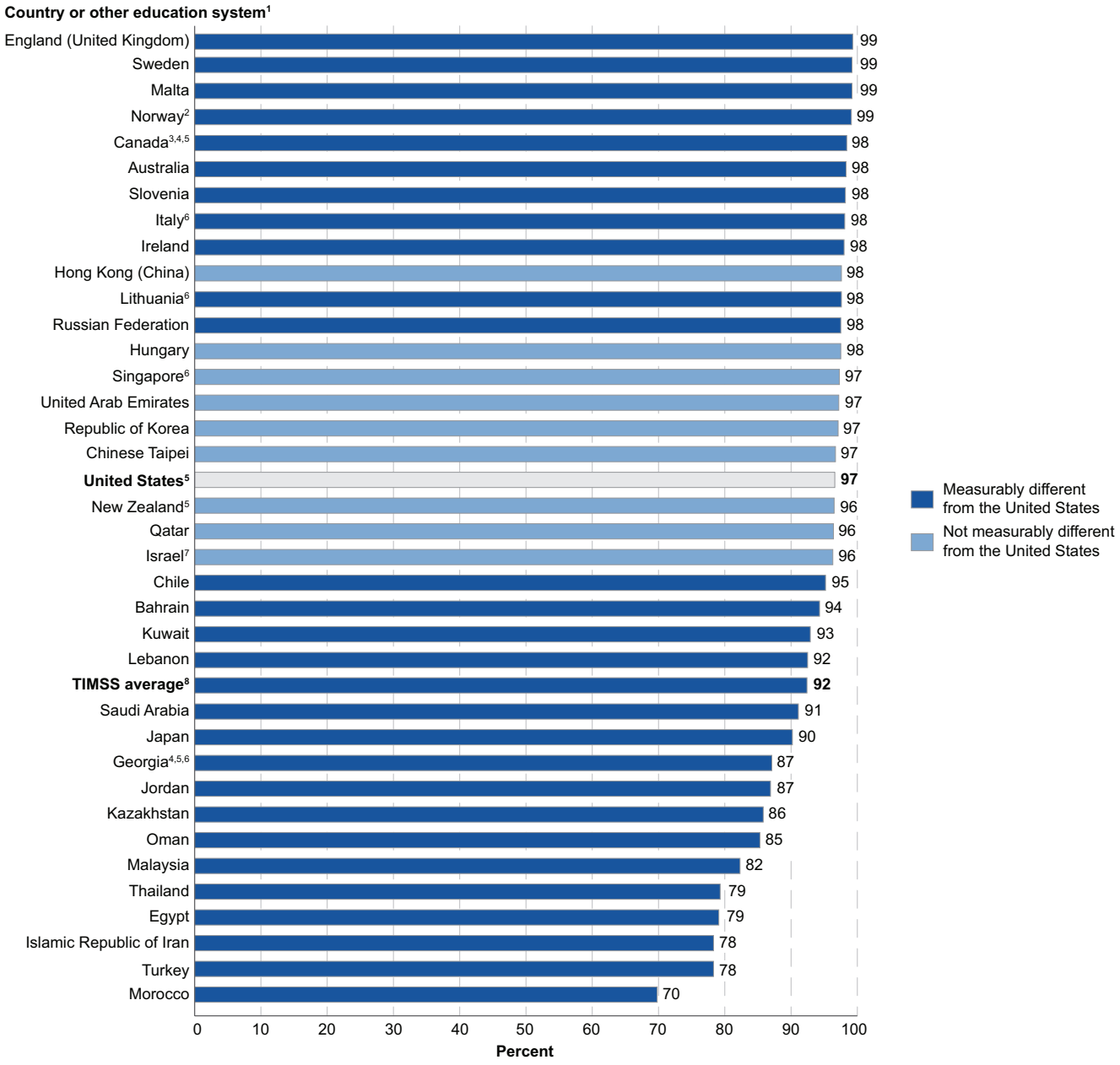
Indicator 8

Access to Computers and the Internet: International Comparisons

In 2015, the percentage of eighth-graders in the United States who had access to their own or a shared computer at home (97 percent) was 4 percentage points higher than the international average. The percentage of eighth-graders in the United States who had access to an internet connection at home (95 percent) was 8 percentage points higher than the international average.

The Trends in International Mathematics and Science Study (TIMSS) is an international data collection conducted by the International Association for the Evaluation of Educational Achievement (IEA). While the main purpose of this data collection is to assess students' performance in mathematics and science across countries, TIMSS also collects information on the educational context in each participating country. In 2015, the eighth-grade TIMSS assessment was administered in 38 participating countries and educational systems.[1] Thirty-seven of these countries or other education systems are included in this analysis.[2] This indicator uses data from TIMSS 2015 to examine differences across countries in eighth-graders' access to computers (including tablets) and the Internet both at home and during mathematics and science lessons at school.

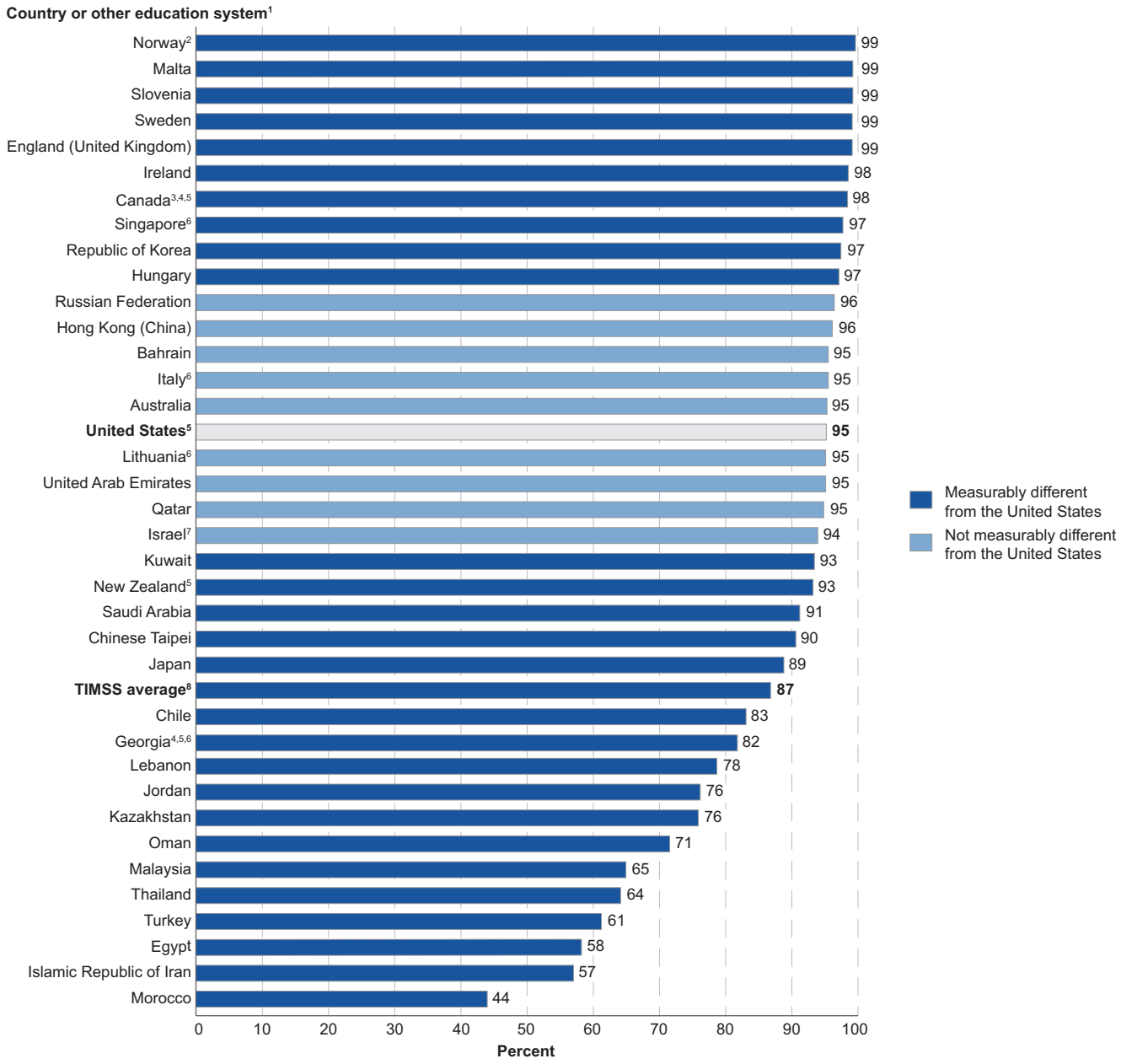
Figure 8.1. Percentage of eighth-graders who had access to their own or a shared computer or tablet at home, by country or other education system: 2015



[1] Most of the education systems represent complete countries, but some represent subnational entities.
[2] Norway collected data from students in their ninth year of schooling rather than in grade 8 because year 1 in Norway is considered the equivalent of kindergarten rather than the first year of primary school.
[3] Data for Canada include only students from the provinces of Alberta, Manitoba, Newfoundland, Ontario, and Quebec.
[4] National Target Population does not include all of the International Target Population as defined by TIMSS.
[5] Met guidelines for sample participation rates only after replacement schools were included.
[6] National Defined Population covers 90 to 95 percent of National Target Population as defined by TIMSS.
[7] National Defined Population covers less than 90 percent of the National Target Population (but at least 77 percent) as defined by TIMSS.
[8] The international average includes only education systems that are members of the International Association for the Evaluation of Educational Achievement (IEA), which develops and implements TIMSS at the international level.
NOTE: Countries and other education systems were required to draw probability samples of students who were nearing the end of their eighth year of formal schooling (counting the first year of primary school as year 1), provided that the mean age at the time of testing was at least 13.5 years. Although rounded numbers are displayed, the figures are based on unrounded estimates.
SOURCE: International Association for the Evaluation of Educational Achievement (IEA), Trends in International Mathematics and Science Study (TIMSS), 2015. See *Digest of Education Statistics 2016*, table 602.32a.

In 2015, the percentage of eighth-graders who had access to their own or a shared computer at home varied across countries. The percentage of eighth-graders who had access to a computer at home ranged from 70 percent in Morocco to 99 percent in England, Sweden, Malta, and Norway. Some 97 percent of eighth-graders in the United States had access to a computer at home, which was 4 percentage points higher than the international average (92 percent). However, 11 countries reported percentages of eighth-graders with access to a computer at home that were higher than the corresponding percentage in the United States. In contrast, the percentage of eighth-graders with access to a computer at home was lower than the U.S. percentage in 16 countries. In 9 countries, the percentage of eighth-graders with access to their own or a shared computer at home was not measurably different from the corresponding percentage in the United States.

Figure 8.2. Percentage of eighth-graders who had access to an internet connection at home, by country or other education system: 2015



[1] Most of the education systems represent complete countries, but some represent subnational entities.
[2] Norway collected data from students in their ninth year of schooling rather than in grade 8 because year 1 in Norway is considered the equivalent of kindergarten rather than the first year of primary school.
[3] Data for Canada include only students from the provinces of Alberta, Manitoba, Newfoundland, Ontario, and Quebec.
[4] National Target Population does not include all of the International Target Population as defined by TIMSS.
[5] Met guidelines for sample participation rates only after replacement schools were included.
[6] National Defined Population covers 90 to 95 percent of National Target Population as defined by TIMSS.
[7] National Defined Population covers less than 90 percent of the National Target Population (but at least 77 percent) as defined by TIMSS.
[8] The international average includes only education systems that are members of the International Association for the Evaluation of Educational Achievement (IEA), which develops and implements TIMSS at the international level.
NOTE: Countries and other education systems were required to draw probability samples of students who were nearing the end of their eighth year of formal schooling (counting the first year of primary school as year 1), provided that the mean age at the time of testing was at least 13.5 years. Although rounded numbers are displayed, the figures are based on unrounded estimates.
SOURCE: International Association for the Evaluation of Educational Achievement (IEA), Trends in International Mathematics and Science Study (TIMSS), 2015. See *Digest of Education Statistics 2016*, table 602.32a.

In 2015, the percentage of eighth-graders who had access to an internet connection at home varied more widely across countries than the percentage who had access to a computer at home. The percentage of eighth-graders who had access to an internet connection at home ranged from 44 percent in Morocco to 99 percent in Norway, Malta, Slovenia, Sweden, and England. In the United States, 95 percent of eighth-graders had access to an internet connection at home, which was 8 percentage points higher than the international average (87 percent). However, 10 countries reported percentages of eighth-graders with access to an internet connection at home that were higher than the corresponding percentage in the United States. In contrast, 17 countries reported percentages of eighth-graders with access to an internet connection at home that were lower than the corresponding percentage in the United States, and 9 countries reported percentages that were not measurably different. In 6 countries (Malaysia, Thailand, Turkey, Egypt, the Islamic Republic of Iran, and Morocco) less than 70 percent of eighth-graders had access to an internet connection at home.

In addition to the variation observed across countries among eighth-graders' access to computers and the Internet at home, differences were also observed across countries in eighth-graders' access to computers during mathematics and science lessons at school.[3] The percentage of eighth-graders who had access to computers during mathematics lessons at school in 2015 ranged from 4 percent in Malta to 65 percent in Sweden. Some 39 percent of eighth-graders in the United States had access to computers during mathematics lessons at school, which was not measurably different than the international average (33 percent). The percentage of eighth-graders in the United States who had access to computers during mathematics lessons at school was higher than the corresponding percentage in 12 countries and was not measurably different from the percentages in 21 countries. Only 3 countries (Sweden, Australia, and Kazakhstan) reported higher percentages of eighth-graders with access to computers during mathematics lessons at school than in the United States.

The percentage of eighth-graders who had access to computers during science lessons at school in 2015 varied more widely across countries than the percentage of eighth-graders who had access to computers during mathematics lessons. The percentage of eighth-graders who had access to computers during science lessons at school in 2015 ranged from 7 percent in Malta to 80 percent in Sweden. Some 51 percent of eighth-graders in the United States had access to computers during science lessons at school, which was not measurably different than the international average (44 percent). The percentage of eighth-graders in the United States who had access to computers during science lessons at school was higher than the corresponding percentage in 10 countries and was not measurably different from the percentages in 22 countries. Only 4 countries (Sweden, Kazakhstan, Australia, and the Russian Federation) reported higher percentages of eighth-graders with access to computers during science lessons at school than in the United States.

Endnotes:

[1] Most of the education systems represent complete countries, but some represent subnational entities.

[2] Armenia participated in the eighth-grade assessment, but its data were not included in the International Database. As a result, Armenia is not included in this analysis.

[3] Data on access to computers at school were based on teacher reports.

Reference tables: Tables 8.1, 8.2, and 8.3.

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Indicator 9

Computer and Internet Use: International Comparisons

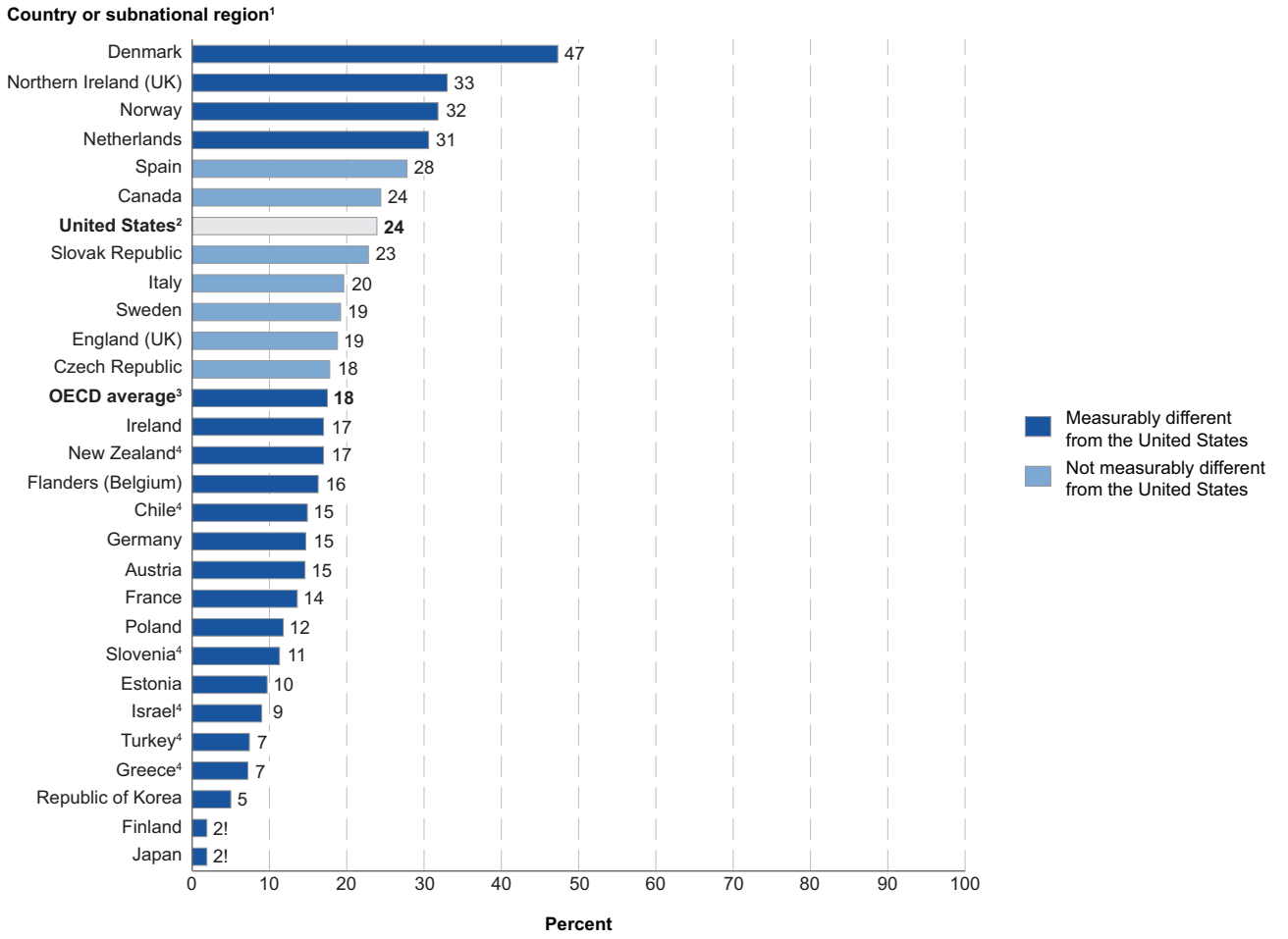
The percentage of 16- to 19-year-olds in the United States who reported using spreadsheet or word processing software every day (24 percent) was higher than the OECD average (18 percent). The percentage of 16- to 19-year-olds in the United States who reported using email every day (57 percent) was not measurably different from the OECD average.

This indicator uses data from the Program for the International Assessment of Adult Competencies (PIAAC) to analyze computer and internet use of 16- to 19-year-olds. Specifically, this indicator uses PIAAC data to compare the percentage of 16- to 19-year-olds in the United States who report using a computer or the Internet for various activities every day with the percentage of 16- to 19-year-olds in other countries. Performance of U.S. 16- to 19-year-olds on the PIAAC assessment is discussed in *Indicator 22*.

PIAAC is an international data collection conducted by the Organization for Economic Cooperation and Development (OECD), an organization of 35 countries whose purpose is to promote trade and economic growth. The OECD also collects and publishes an array of data on its member countries. The main PIAAC data collection was completed in 2012. A second data collection was completed in 2015; this round was conducted only in countries that did not participate in the first round.[1] In total, 28 OECD countries and subnational regions participated in PIAAC and are included in this analysis.

Skills in using computers and the Internet to perform basic activities and solve problems is increasingly important for individuals' economic and social well-being (OECD 2016a). Using PIAAC data from 2012, 2014, and 2015, this indicator discusses the frequency of 16- to 19-year-olds' computer and internet use across countries using four measures: *use of spreadsheet or word processing software; use of email; participation in real-time discussion on the Internet;* and *use of the Internet to understand issues such as health/illness, financial matters, or environmental issues*.

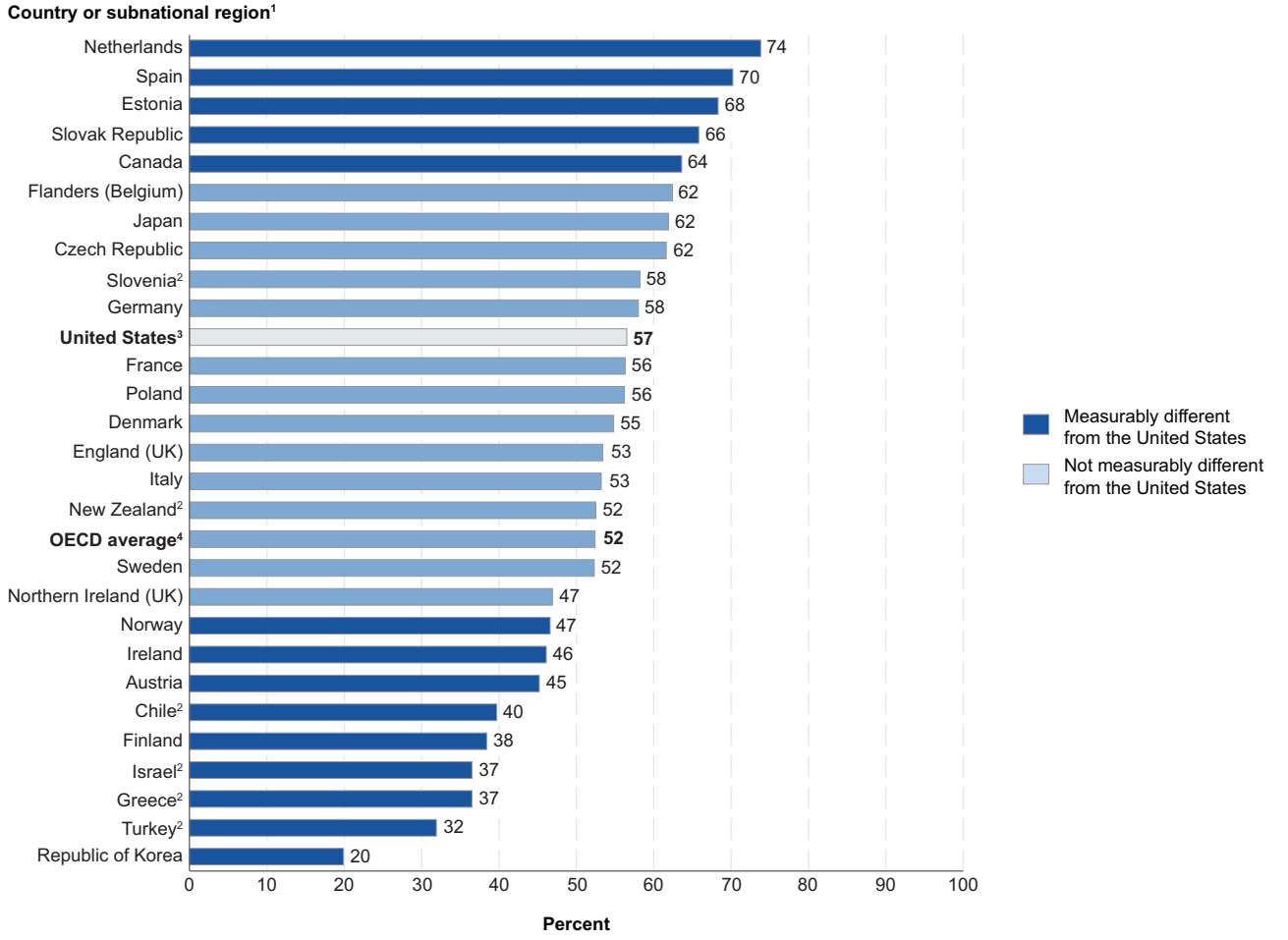
Figure 9.1. Percentage of 16- to 19-year-olds who used spreadsheet or word processing software every day, by selected Organization for Economic Cooperation and Development (OECD) countries or subnational regions: 2012, 2014, and 2015



! Interpret data with caution. The coefficient of variation (CV) for this estimate is between 30 and 50 percent.
[1] Most entities participating in the Program for the International Assessment of Adult Competencies (PIAAC) survey are countries, but a few of them are subnational regions. Following the name of each subnational region, its country is indicated in parentheses. For example, England and Northern Ireland are both part of the United Kingdom (UK).
[2] A supplemental round of data collection was completed in 2014 in order to expand the sample of U.S. adults, allowing for more in-depth data analysis. Results from the United States are based on combined data from 2012 and 2014.
[3] Refers to the mean of the data values for all reporting Organization for Economic Cooperation and Development (OECD) countries and subnational regions, to which each country or subnational region reporting data contributes equally.
[4] Data are from 2015.
NOTE: The main data collection for the PIAAC survey was completed in 2012. Unless otherwise noted, all countries' and subnational regions' results are based on the 2012 round of data collection. A second round of international data collection was completed in 2015; this round was conducted only in six countries/regions that did not participate in the first round. Although rounded numbers are displayed, the figures are based on unrounded estimates.
SOURCE: U.S. Department of Education, National Center for Education Statistics, Program for the International Assessment of Adult Competencies (PIAAC), U.S. PIAAC 2012/2014; Organization for Economic Cooperation and Development, PIAAC 2012 and 2015. See *Digest of Education Statistics 2016*, table 604.40.

The percentage of 16- to 19-year-olds in the United States who reported using spreadsheet or word processing software every day (24 percent) was 6 percentage points higher than the OECD average. The percentage of 16- to 19-year-olds who reported using spreadsheet or word processing software every day ranged from 2 percent in Japan and Finland to 47 percent in Denmark. In 4 countries or subnational regions (Denmark, Northern Ireland, Norway, and the Netherlands), the percentage of 16- to 19-year-olds who reported using spreadsheet or word processing software every day was higher than the U.S. percentage. In contrast, 16 countries or subnational regions reported percentages of 16- to 19-year-olds using spreadsheet or word processing software every day that were lower than the U.S. percentage, and 7 countries or subnational regions reported percentages that were not measurably different.

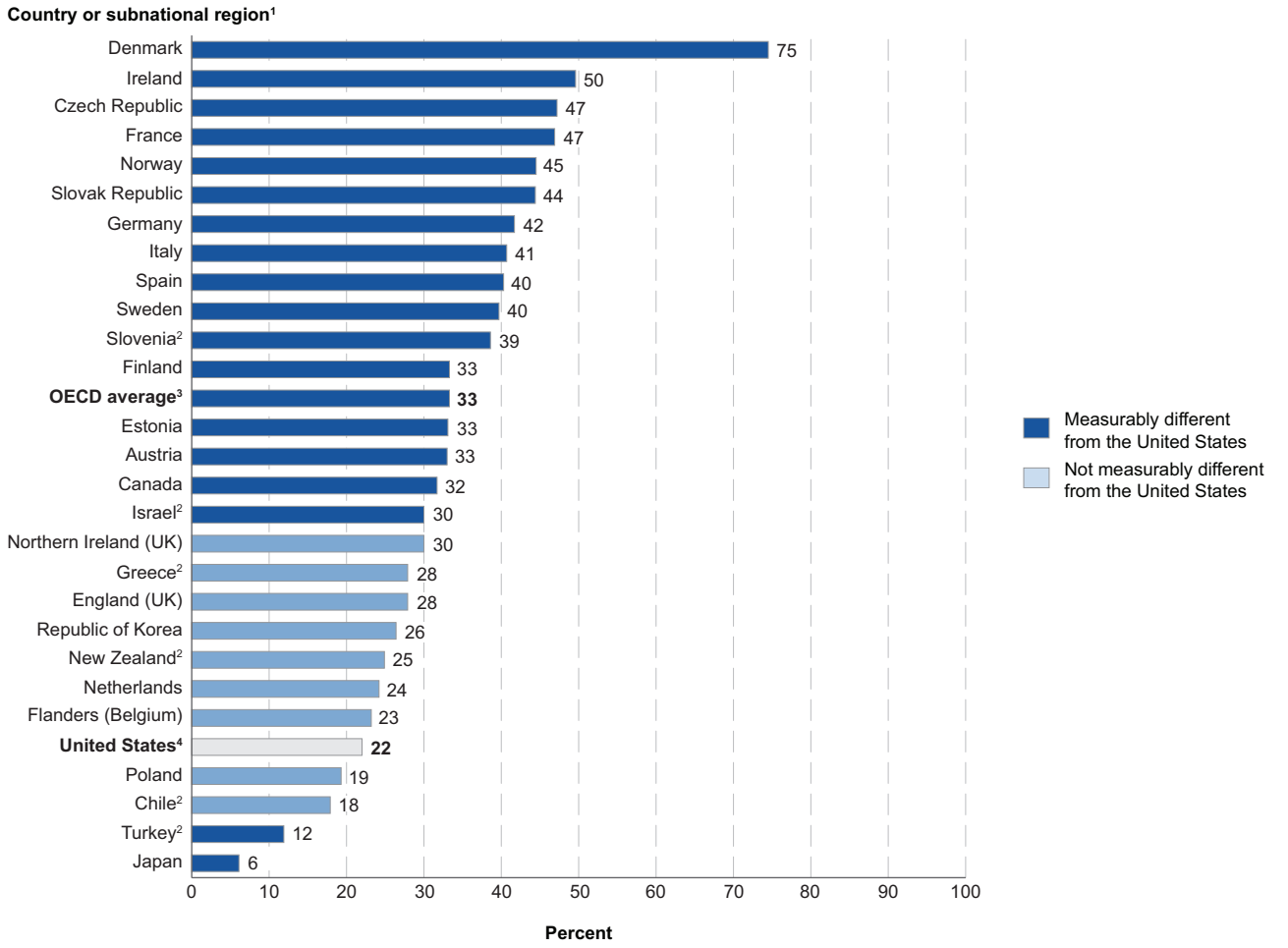
Figure 9.2. Percentage of 16- to 19-year-olds who used email every day, by selected Organization for Economic Cooperation and Development (OECD) countries or subnational regions: 2012, 2014, and 2015



[1] Most entities participating in the Program for the International Assessment of Adult Competencies (PIAAC) survey are countries, but a few of them are subnational regions. Following the name of each subnational region, its country is indicated in parentheses. For example, England and Northern Ireland are both part of the United Kingdom (UK).
[2] Data are from 2015.
[3] A supplemental round of data collection was completed in 2014 in order to expand the sample of U.S. adults, allowing for more in-depth data analysis. Results from the United States are based on combined data from 2012 and 2014.
[4] Refers to the mean of the data values for all reporting Organization for Economic Cooperation and Development (OECD) countries and subnational regions, to which each country or subnational region reporting data contributes equally.
NOTE: The main data collection for the PIAAC survey was completed in 2012. Unless otherwise noted, all countries' and subnational regions' results are based on the 2012 round of data collection. A second round of international data collection was completed in 2015; this round was conducted only in six countries/regions that did not participate in the first round. Although rounded numbers are displayed, the figures are based on unrounded estimates.
SOURCE: U.S. Department of Education, National Center for Education Statistics, Program for the International Assessment of Adult Competencies (PIAAC), U.S. PIAAC 2012/2014; Organization for Economic Cooperation and Development, PIAAC 2012 and 2015. See *Digest of Education Statistics 2016*, table 604.40.

The percentage of 16- to 19-year-olds in the United States who reported using email every day (57 percent) was not measurably different from the OECD average. The percentage of 16- to 19-year-olds who reported using email every day ranged from 20 percent in the Republic of Korea to 74 percent in the Netherlands. In 5 countries (the Netherlands, Spain, Estonia, the Slovak Republic, and Canada), the percentage of 16- to 19-year-olds who reported using email every day was higher than the corresponding percentage in the United States. In contrast, 9 countries reported percentages of 16- to 19-year-olds using email every day that were lower than the U.S. percentage, and 13 countries or subnational regions reported percentages that were not measurably different.

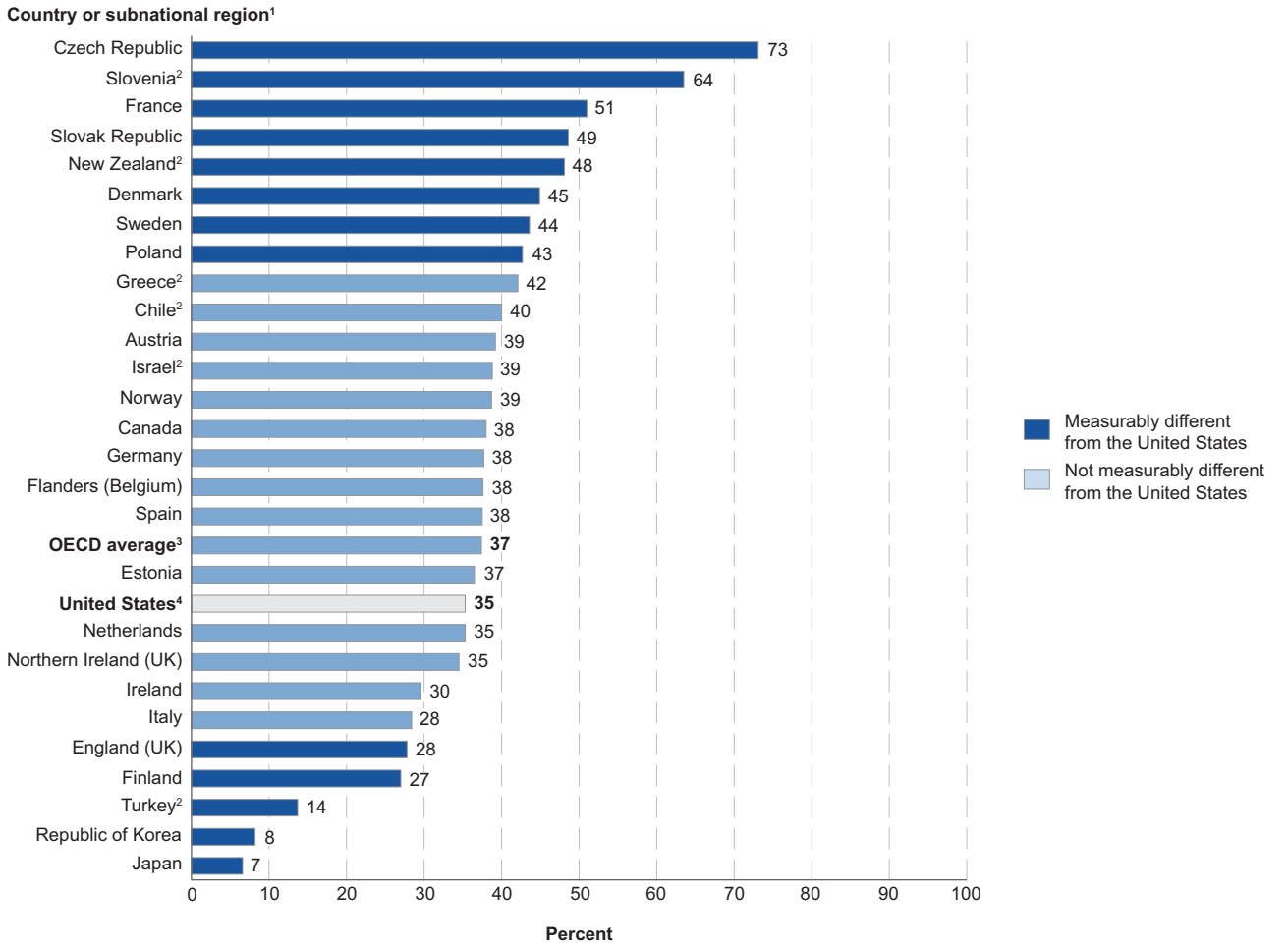
Figure 9.3. Percentage of 16- to 19-year-olds who participated in real-time discussions on the Internet every day, by selected Organization for Economic Cooperation and Development (OECD) countries or subnational regions: 2012, 2014, and 2015



[1] Most entities participating in the Program for the International Assessment of Adult Competencies (PIAAC) survey are countries, but a few of them are subnational regions. Following the name of each subnational region, its country is indicated in parentheses. For example, England and Northern Ireland are both part of the United Kingdom (UK).
[2] Data are from 2015.
[3] Refers to the mean of the data values for all reporting Organization for Economic Cooperation and Development (OECD) countries and subnational regions, to which each country or subnational region reporting data contributes equally.
[4] A supplemental round of data collection was completed in 2014 in order to expand the sample of U.S. adults, allowing for more in-depth data analysis. Results from the United States are based on combined data from 2012 and 2014.
NOTE: The main data collection for the PIAAC survey was completed in 2012. Unless otherwise noted, all countries' and subnational regions' results are based on the 2012 round of data collection. A second round of international data collection was completed in 2015; this round was conducted only in six countries/regions that did not participate in the first round. Although rounded numbers are displayed, the figures are based on unrounded estimates.
SOURCE: U.S. Department of Education, National Center for Education Statistics, Program for the International Assessment of Adult Competencies (PIAAC), U.S. PIAAC 2012/2014; Organization for Economic Cooperation and Development, PIAAC 2012 and 2015. See *Digest of Education Statistics 2016*, table 604.40.

The percentage of 16- to 19-year-olds in the United States who reported that they used the Internet to participate in real-time discussions every day (22 percent) was 11 percentage points lower than the OECD average. The percentage of 16- to 19-year-olds who reported performing these activities every day ranged from 6 percent in Japan to 75 percent in Denmark. Denmark's percentage was 25 percentage points higher than Ireland, the country with the second highest percentage (50 percent). The percentage of 16- to 19-year-olds who reported participating in real-time discussions on the Internet every day was higher than the corresponding U.S. percentage in 16 countries; conversely, only 2 countries (Turkey and Japan) reported percentages that were lower than the U.S. percentage. In 9 countries or subnational regions, the percentage of 16- to 19-year-olds who reported participating in real-time discussions on the Internet every day was not measurably different from the corresponding percentage in the United States.

Figure 9.4. Percentage of 16- to 19-year-olds who used the Internet to understand issues such as health/illness, financial matters, or environmental issues every day, by selected Organization for Economic Cooperation and Development (OECD) countries or subnational regions: 2012, 2014, and 2015



[1] Most entities participating in the Program for the International Assessment of Adult Competencies (PIAAC) survey are countries, but a few of them are subnational regions. Following the name of each subnational region, its country is indicated in parentheses. For example, England and Northern Ireland are both part of the United Kingdom (UK).
[2] Data are from 2015.
[3] Refers to the mean of the data values for all reporting Organization for Economic Cooperation and Development (OECD) countries and subnational regions, to which each country or subnational region reporting data contributes equally.
[4] A supplemental round of data collection was completed in 2014 in order to expand the sample of U.S. adults, allowing for more in-depth data analysis. Results from the United States are based on combined data from 2012 and 2014.
NOTE: The main data collection for the PIAAC survey was completed in 2012. Unless otherwise noted, all countries' and subnational regions' results are based on the 2012 round of data collection. A second round of international data collection was completed in 2015; this round was conducted only in six countries/regions that did not participate in the first round. Although rounded numbers are displayed, the figures are based on unrounded estimates.
SOURCE: U.S. Department of Education, National Center for Education Statistics, Program for the International Assessment of Adult Competencies (PIAAC), U.S. PIAAC 2012/2014; Organization for Economic Cooperation and Development, PIAAC 2012 and 2015. See *Digest of Education Statistics 2016*, table 604.40.

The percentage of 16- to 19-year-olds in the United States who reported using the Internet to understand issues such as health/illness, financial matters, or environmental issues every day (35 percent) was not measurably different from the OECD average. The percentage who reported using the Internet to understand such issues every day ranged from 7 percent in Japan to 73 percent in the Czech Republic. In 8 countries, the percentage of 16- to 19-year-olds who reported using the Internet to understand such issues every day was higher than the U.S. percentage. In contrast, the percentage of 16- to 19-year-olds in the United States who reported using the Internet to understand such issues every day was higher than the corresponding percentage in 5 countries or subnational regions: England, Finland, Turkey, the Republic of Korea, and Japan. In 15 countries or subnational regions, the percentages of 16- to 19-year-olds who used the Internet to understand health/illness, financial matters, or environmental issues every day that were not measurably different from the percentage in the United States.

Endnotes:

[1] Chile, Greece, Israel, New Zealand, Slovenia, and Turkey did not participate in the first round of data collection. Data for these countries are from 2015. In the United States only, a supplemental round of data collection was completed in 2014 to expand the sample of U.S. adults and allow for more in-depth data analysis.

Reference tables: Table 9.1.

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Section 2: Barriers in Student Access to Digital Learning Resources Outside of the Classroom

As discussed in the previous section, student access to digital learning resources (DLR) outside of the classroom varies with respect to characteristics of children and their families. This section presents five indicators based on analyses of the most recently available nationally representative survey data that provide an overview of potential barriers to students' access to the Internet and computers at home. The section also describes how access for children with different individual and household characteristics varies in ways that may be associated with these barriers.

Barriers to Internet Access

Results from the indicator analyses find that the two main reasons children ages 3 to 18 lacked access to the Internet at home in 2015 were that access was too expensive and that the family did not need it or was not interested in having it (38 percent each, *Indicator 10*). Other main reasons for no home internet access were that the home lacked an adequate computer for internet use, internet service was not available in the area, the Internet could be used elsewhere, and the family had concerns about online privacy, cybersecurity, and personal safety. Internet access being too expensive was more commonly the main barrier for children from low income families and for children whose parents had low levels of educational attainment than for other children.

The percentage of students ages 5 to 17 who had access to the Internet at home in 2015 varied by their home's geographic locale and their family's poverty status (*Indicators 11* and *12*). Fixed broadband access[1] at home was most common for students in suburban areas and least common for students in rural areas. Also, fixed broadband access was less common in remote and distant rural areas than in fringe rural areas. Within these locale types, there were additional gaps among students of different poverty levels and racial/ethnic groups. Across geographic locales, the percentages of students with either no internet access or only dial-up access were consistently higher for students living below the poverty threshold than for students living at greater than 185 percent of the poverty threshold.

Although the data used for the indicators in this report were not able to explore barriers to home internet access for people residing on Tribal lands[2] or in U.S. territories, the Federal Communications Commission (FCC) reports such information in its *2016 Broadband Progress Report* (FCC 2016a). At the end of 2014, the FCC found that while 10 percent of Americans overall lacked access to fixed broadband services, the percentage was several times higher for those living on Tribal lands and in U.S. territories, especially in rural areas. Forty-one percent of those living on Tribal lands overall and 68 percent living in rural tribal communities lacked access. In U.S. territories, 66 percent overall lack fixed broadband access and 98 percent living in rural territorial areas lacked access.

Barriers to Home Computer Access

In 2015, students in grades 4, 8, and 12 also differed in their ownership of digital devices at home and when they first used a laptop or desktop computer (*Indicators 13* and *14*). While over 90 percent of students at each grade level reported that they owned or shared a digital device in their home, it was less common for students eligible for free or reduced-price lunch than for their peers to own or share a digital device in their home. Early exposure to computers (i.e., first using a computer in kindergarten or before) was less common for students eligible for free or reduced-price lunch and for students who were English language learners than for their respective peers.

Endnotes:

[1] Fixed broadband (of any sort) excludes mobile broadband, but includes all other non-dial-up internet service, such as DSL, cable modem, fiber-optic cable, and satellite internet service.

[2] As defined by the U.S. Census Bureau during the 2010 Census, Tribal lands refer to census tracts where at least 50 percent of the land area is comprised of federally recognized reservations, off-reservation trust land, joint use areas, statistical American Indian areas, Alaskan Native village statistical areas, and Hawaiian Home Lands. This definition excludes state-recognized American Indian areas.

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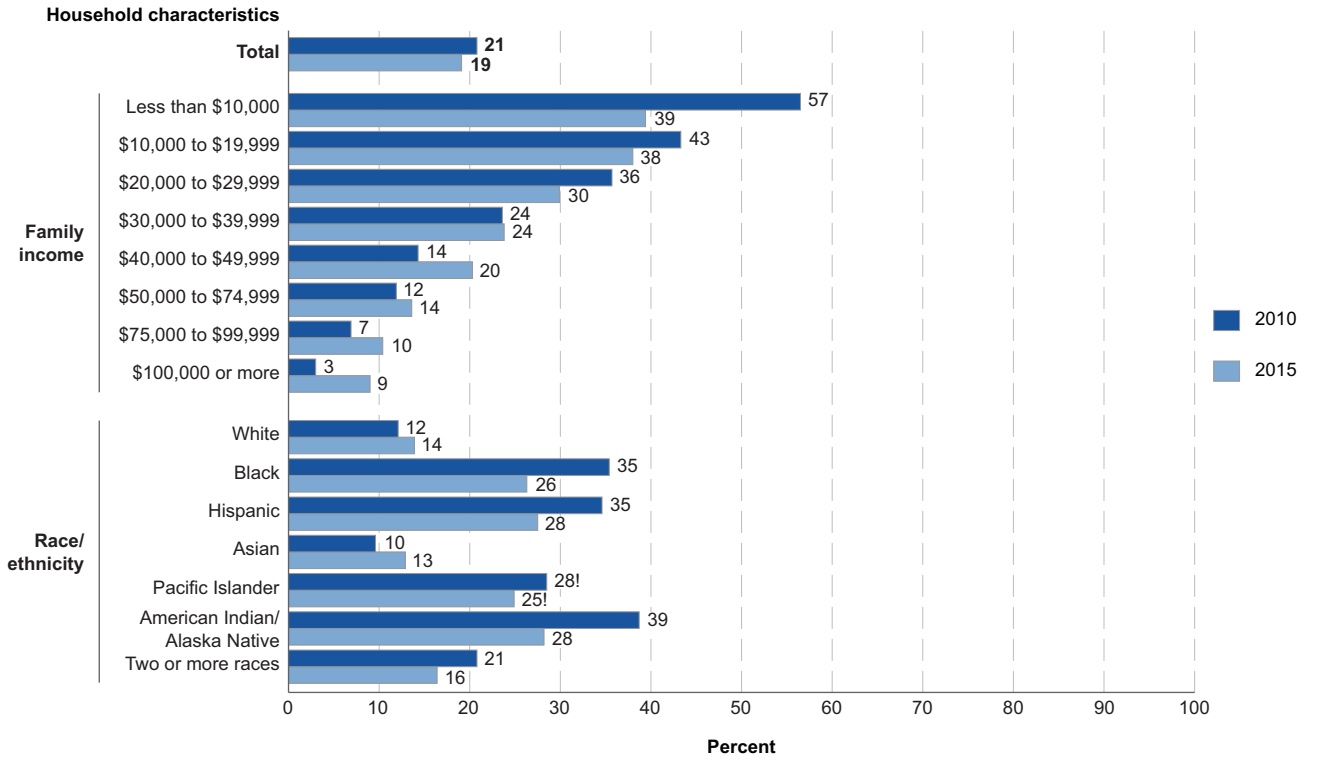
Indicator 10

Barriers to Internet Access at Home

In 2015, the most common main reasons for children ages 3 to 18 not having home internet access were that it was too expensive (38 percent), that their family did not need it or were not interested in having it (38 percent), that their home lacked a computer or a computer adequate for internet use (8 percent), and that internet service was not available in the area (5 percent).

This indicator uses data from the Current Population Survey to describe differences in the percentage of children ages 3 to 18 who lacked access to the Internet at home in 2010 and in 2015 and to explore the main reasons reported for not having access.[1] It then focuses on the percentage of children with different barriers to internet access in their home in 2015, describing differences in relation to race/ethnicity, age, highest level of education attained by either parent, and family income. This indicator considers the following main reasons for not having home internet access as barriers to access: that it is too expensive (i.e., the family could not afford it or it was not worth the cost), that the home lacks a computer or a computer adequate for internet use, and that internet service is not available in the area.

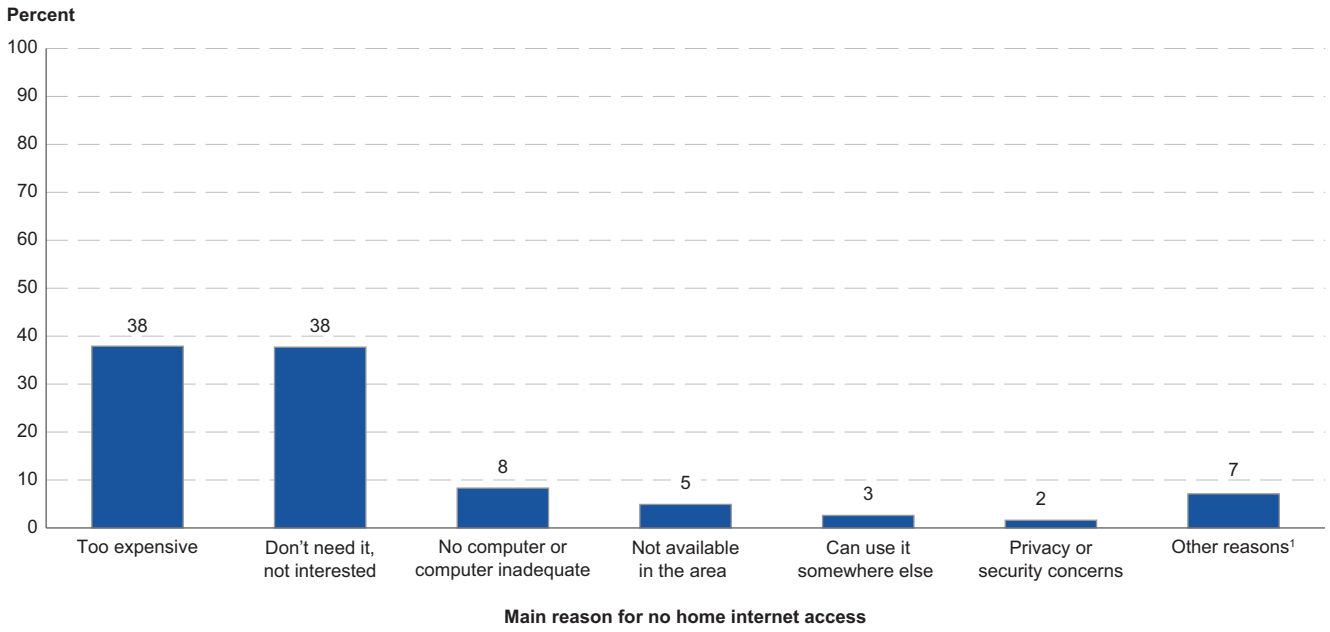
Figure 10.1. Percentage of children ages 3 to 18 with no internet access at home, by family income and race/ethnicity: 2010 and 2015



! Interpret data with caution. The coefficient of variation (CV) for this estimate is between 30 and 50 percent.
NOTE: Family income shown in current dollars. Data are based on sample surveys of the civilian noninstitutionalized population, which excludes persons in the military and persons living in institutions (e.g., prisons or nursing facilities). Data for 2015 were collected in the July supplement to the Current Population Survey (CPS), while data for 2010 were collected in the October supplement. The July supplement consists solely of questions about computer and internet use. In contrast, the October supplement focuses on school enrollment, although it also includes questions about computer and internet use. Measurable differences in estimates across years could reflect actual changes in the population; however, differences could also reflect seasonal variations in data collection or differences between the content of the July and October supplements. Therefore, caution should be used when making year-to-year comparisons. Race categories exclude persons of Hispanic ethnicity. Although rounded numbers are displayed, the figures are based on unrounded estimates.
SOURCE: U.S. Department of Commerce, Census Bureau, Current Population Survey (CPS), October 2010 and July 2015. See *Digest of Education Statistics 2016*, table 702.40.

The percentage of children ages 3 to 18 with no internet access at home was lower in 2015 (19 percent) than in 2010 (21 percent); however, home internet access in 2015 varied by household characteristics. For instance, higher percentages of American Indian/Alaska Native (28 percent), Hispanic (28 percent), and Black children (26 percent) did not have home internet access in 2015, compared with the percentages of children of Two or more races (16 percent), White children (14 percent), and Asian children (13 percent). Also, the percentages of children ages 3 to 18 who did not have home internet access were lower for those with higher family incomes than for those with lower family incomes, ranging from 9 percent lacking access for those with a family income of $100,000 or more to 39 percent for those with a family income of less than $10,000.

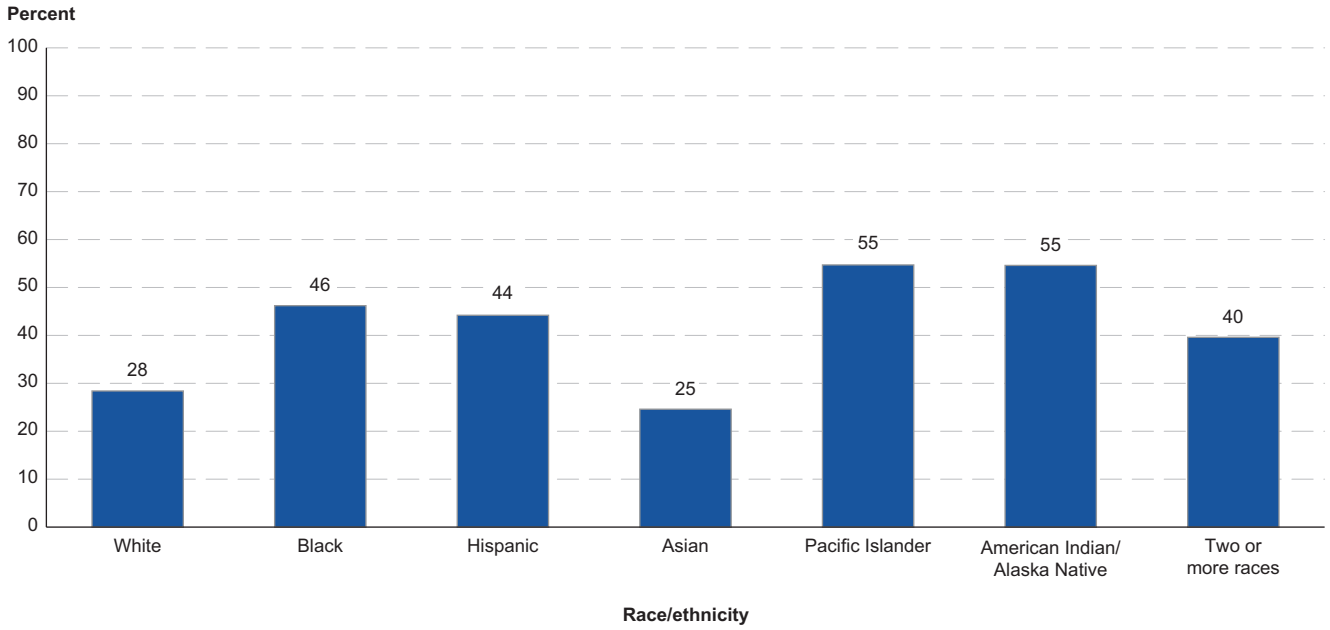
Figure 10.2. Percentage distribution of children ages 3 to 18 with no internet access at home, by main reason for not having access: 2015



[1] Respondents could specify "other" reasons. Examples of other reasons were not provided to respondents.
NOTE: Includes only children living in homes with no internet access. Data are based on sample surveys of the civilian noninstitutionalized population, which excludes persons in the military and persons living in institutions (e.g., prisons or nursing facilities). Detail may not sum to totals because of rounding. Although rounded numbers are displayed, the figures are based on unrounded estimates.
SOURCE: U.S. Department of Commerce, Census Bureau, Current Population Survey (CPS), July 2015. See *Digest of Education Statistics 2016*, table 702.40.

In 2015, the two most common main reasons for children ages 3 to 18 to not have home internet access were that it was too expensive or that the family did not need it or were not interested in having it (38 percent each). Other main reasons for not having home internet access included that the home lacked a computer or a computer adequate for internet use (8 percent), internet service was not available in the area (5 percent), the Internet could be used somewhere else (3 percent), and privacy and security concerns (i.e., online privacy and cybersecurity and personal safety concerns) (2 percent). Estimates from 2015 are not directly comparable to those from 2010 because of differences in the question wording and the exclusion of privacy or security concerns as a response option in the 2010 survey. However, the prevalence of other main reasons for no home internet access in 2010 differed from the pattern observed in 2015. In 2010, the most common main reason for children ages 3 to 18 not having home internet access was that it was too expensive (47 percent). Other main reasons for not having home internet access included that the family did not need it or were not interested in having it (22 percent), the home lacked a computer or a computer adequate for internet use (17 percent), the Internet could be used somewhere else (6 percent), and internet service was not available in the area (2 percent).

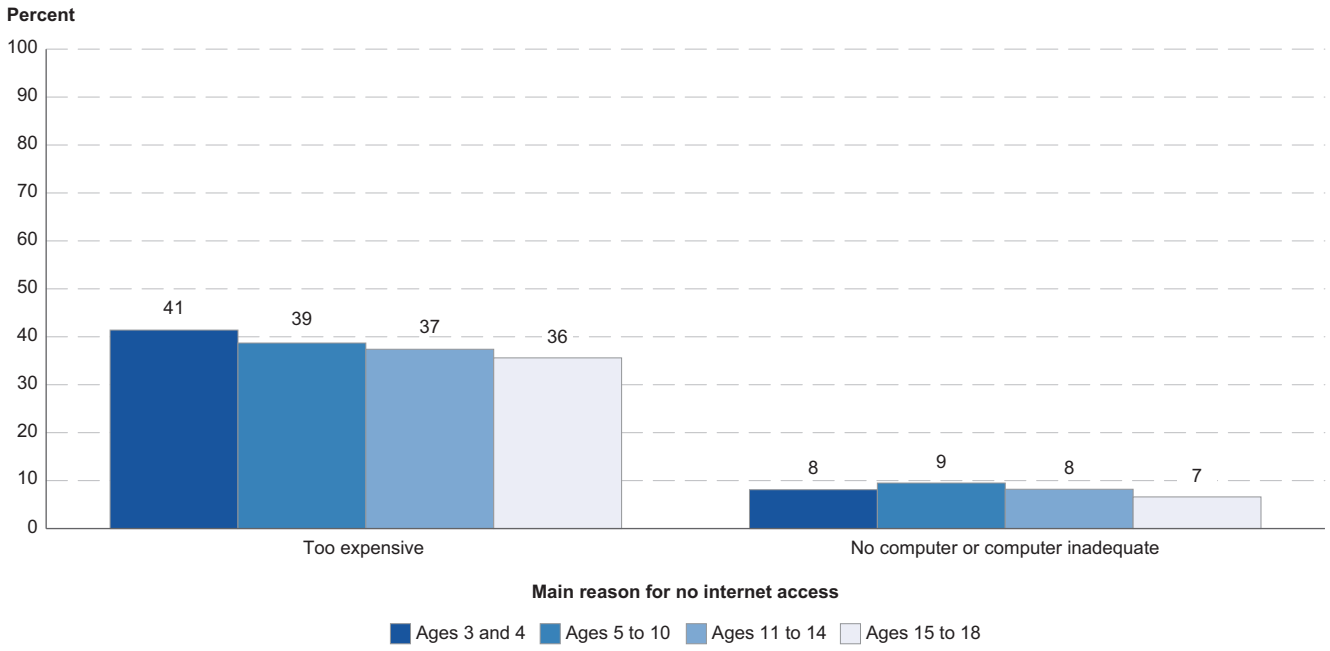
Figure 10.3. Percentage of children ages 3 to 18 whose main reason for no home internet access was that it was too expensive, by race/ethnicity: 2015



NOTE: Race categories exclude persons of Hispanic ethnicity. Includes only children living in homes with no internet access. Data are based on sample surveys of the civilian noninstitutionalized population, which excludes persons in the military and persons living in institutions (e.g., prisons or nursing facilities). Although rounded numbers are displayed, the figures are based on unrounded estimates.
SOURCE: U.S. Department of Commerce, Census Bureau, Current Population Survey (CPS), July 2015. See *Digest of Education Statistics 2016*, table 702.40.

In 2015, the percentage of children ages 3 to 18 whose main barrier to home internet access was that it was too expensive was higher for American Indian/Alaska Native children (55 percent), Black children (46 percent), Hispanic children (44 percent), and children of Two or more races (40 percent) than for White (28 percent) and Asian children (25 percent). No measurable differences across racial/ethnic groups were observed in the percentages of children whose main barrier was a lack of a computer or a computer adequate for internet access. On the other hand, lower percentages of Black (3 percent) and Hispanic children (2 percent) did not have home internet access for the main reason that service was not available in their area, compared with 8 percent of White children.

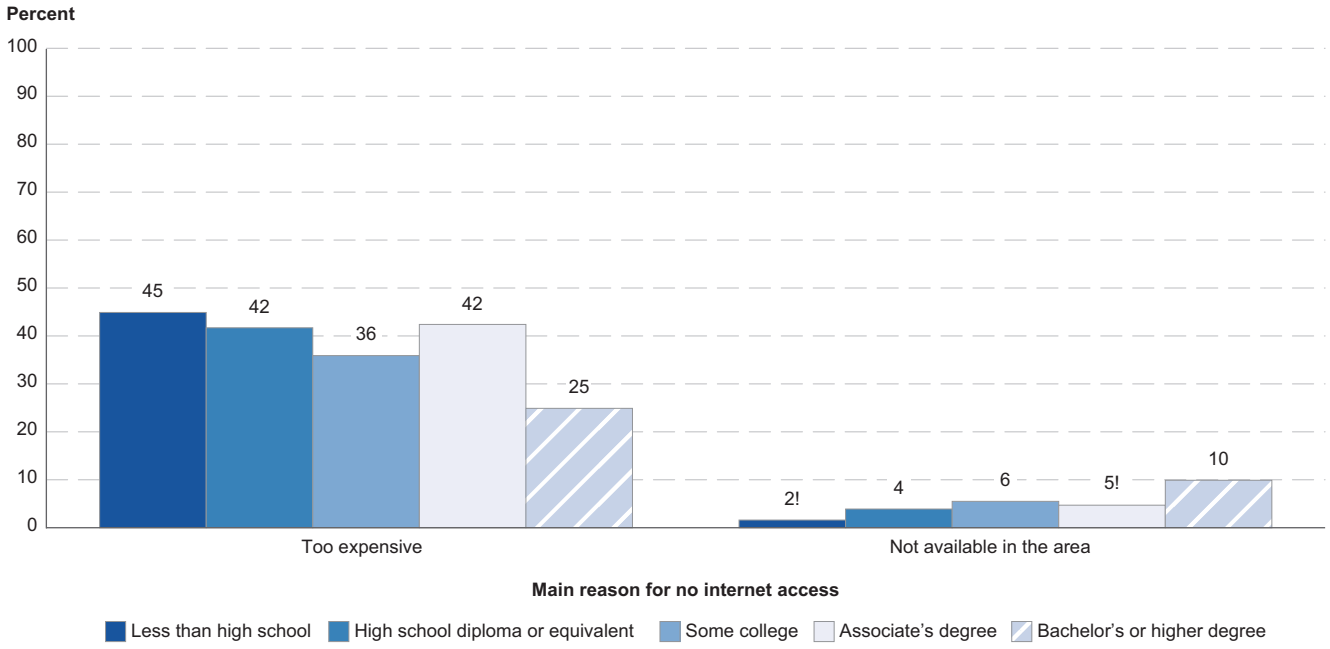
Figure 10.4. Percentage of children ages 3 to 18 whose main reason for no home internet access was that it was too expensive or that the home lacked a computer or computer adequate for internet use, by age: 2015



NOTE: Includes only children living in homes with no internet access. Data are based on sample surveys of the civilian noninstitutionalized population, which excludes persons in the military and persons living in institutions (e.g., prisons or nursing facilities).
SOURCE: U.S. Department of Commerce, Census Bureau, Current Population Survey (CPS), July 2015. See *Digest of Education Statistics 2016*, table 702.40.

For the most part, the main barriers to home internet access in 2015 did not vary for children from different age groups. However, a higher percentage of children ages 3 to 4 than ages 15 to 18 did not have home internet access for the main reason that it was too expensive (41 vs. 36 percent), and a higher percentage of children ages 5 to 10 than ages 15 to 18 did not have access for the main reason that they lacked a computer or a computer adequate for internet use (9 vs. 7 percent). No measurable differences were observed across age groups in the percentage whose main barrier to internet access was a lack of availability in the area.

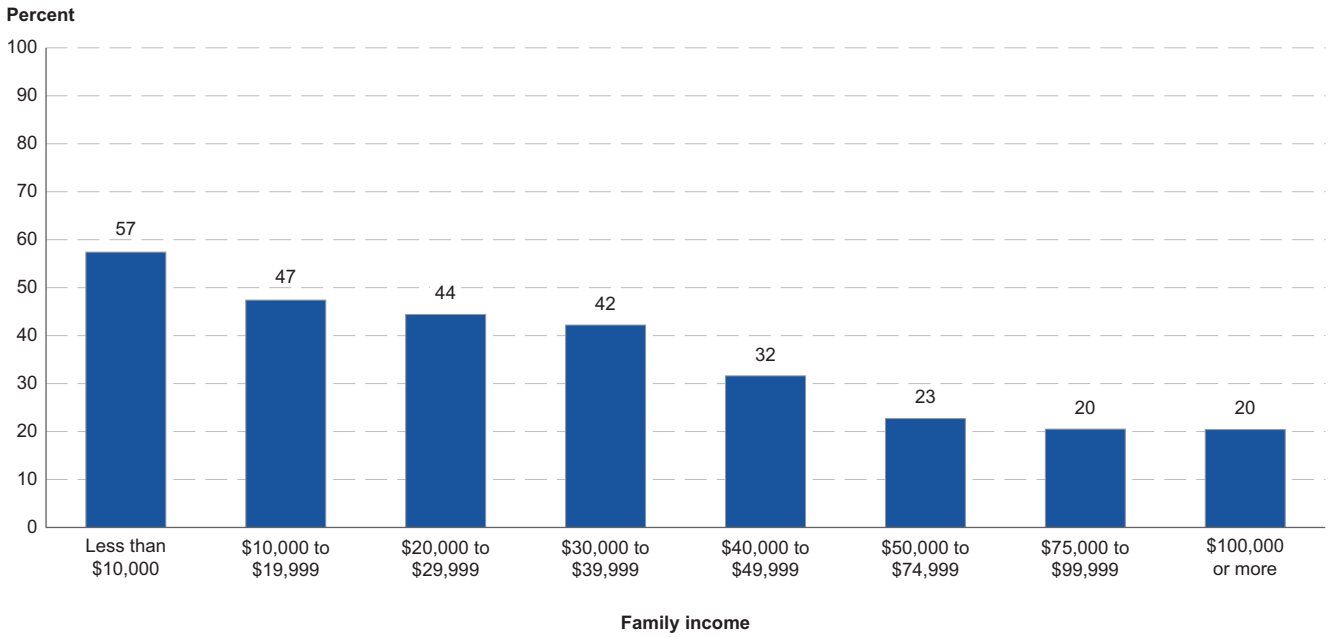
Figure 10.5. Percentage of children ages 3 to 18 whose main reason for no home internet access was that it was too expensive or that internet service was not available in the area, by highest level of education attained by either parent: 2015



! Interpret data with caution. The coefficient of variation (CV) for this estimate is between 30 and 50 percent.
NOTE: Highest education level attained by either parent includes any parent residing with the child (including an adoptive or stepparent). Includes only children who resided with at least one of their parents. Includes only children living in homes with no internet access. Data are based on sample surveys of the civilian noninstitutionalized population, which excludes persons in the military and persons living in institutions (e.g., prisons or nursing facilities).
SOURCE: U.S. Department of Commerce, Census Bureau, Current Population Survey (CPS), July 2015. See *Digest of Education Statistics 2016*, table 702.40.

In 2015, it was less common for expense to be a main barrier to home internet access among children ages 3 to 18 whose parents had attained a bachelor's or higher degree (25 percent) than it was among children whose parents had attained lower levels of education (ranging from 36 to 45 percent). In contrast, it was more common for children whose parents had attained a bachelor's or higher degree for their main barrier to be a lack of internet service in the area (10 percent) than it was for children whose parents had lower levels of educational attainment (2 to 6 percent). In addition, a lower percentage of children whose parents had not completed high school did not have home internet access for the main reason that service was not available in their area (2 percent), compared with children whose parents' educational attainment level was an associate's degree (5 percent) or some college (6 percent). With respect to a lack of a computer or a computer adequate for internet access, a lower percentage of children whose parents had attained an associate's degree had this as their main barrier to home internet access (4 percent) than did children whose parents had other levels of educational attainment (8 to 10 percent).

Figure 10.6. Percentage of children ages 3 to 18 whose main reason for no home internet access was that it was too expensive, by family income: 2015



NOTE: Family income shown in current dollars. Includes only children living in homes with no internet access. Data are based on sample surveys of the civilian noninstitutionalized population, which excludes persons in the military and persons living in institutions (e.g., prisons or nursing facilities). Although rounded numbers are displayed, the figures are based on unrounded estimates.
SOURCE: U.S. Department of Commerce, Census Bureau, Current Population Survey (CPS), July 2015. See *Digest of Education Statistics 2016*, table 702.40.

The percentage of children ages 3 to 18 with different main barriers to home internet access in 2015 also varied by family income level. It was more common for children in families with lower incomes than for those with higher incomes for their main barrier to home internet access to be that it was too expensive. For example, 57 percent of children with family incomes less than $10,000, 47 percent of those with incomes between $10,000 and $19,999, 44 percent of those with incomes between $20,000 and $29,999, 42 percent of those with family incomes between $30,000 and $39,999, and 32 percent of those with family incomes between $40,000 and $49,999 did not have home internet access due to the barrier of it being too expensive, compared with 20 to 23 percent of children with family incomes of $50,000 or more (in current dollars). On the other hand, 11 percent of children in families with incomes of $100,000 or higher did not have home internet access due to the barrier of a lack of internet service in the area, compared with 1 to 4 percent of children with family incomes less than $40,000. No patterns of associations were observed across income groups in the percentage whose main barrier to internet access was a lack of a computer or a computer adequate for internet access.

Endnotes:

[1] Data for 2015 were collected in the July supplement to the Current Population Survey (CPS), while data for 2010 were collected in the October supplement. The July supplement consists solely of questions about computer and internet use. In contrast, the October supplement focuses on school enrollment, although it also includes questions about computer and internet use. Measurable differences in estimates across years could reflect actual changes in the population; however, differences could also reflect seasonal variations in data collection or differences between the content of the July and October supplements. Therefore, caution should be used when making year-to-year comparisons.

Reference tables: Table 10.1.

Indicator 11

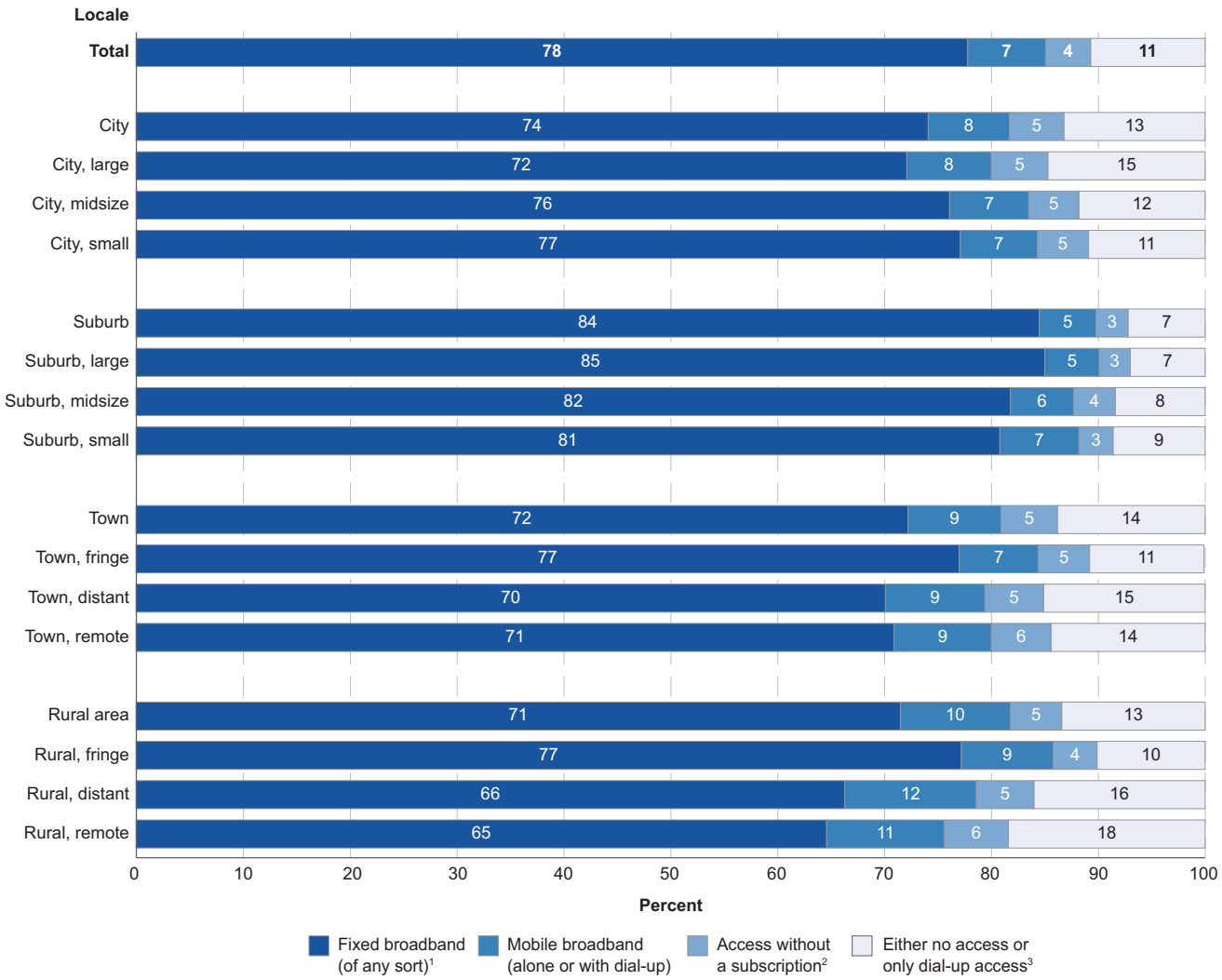
Student Internet Access by Locale and Poverty

In 2015, about 11 percent of 5- to 17-year-old students had no access to the Internet or only had dial-up access at home. The percentage of students who had no access to the Internet or only had dial-up access was higher for students living below the poverty threshold (26 percent) than for students living between 100 and 185 percent of the poverty threshold (15 percent) and at greater than 185 percent of the poverty threshold (4 percent).

Studies have shown that differences in internet access exist across students with different characteristics, including household income levels and geographic locale (File and Ryan 2014; Horrigan and Duggan 2015). This indicator uses data from the American Community Survey to examine the percentages of students ages 5 to 17 with home internet access in 2015 by type of access, poverty status,[1] and geographic locale.

Students can access the Internet from home through different methods, such as a broadband subscription, either fixed or mobile, or even without a subscription.[2] Fixed broadband (of any sort) excludes mobile broadband, but includes all other non-dial-up internet service, such as DSL, cable modem, fiber-optic cable, and satellite internet service. Mobile broadband includes computer and cell phone plans. In this indicator, mobile broadband includes households with mobile broadband either alone or with dial-up access at home. In addition, "either no access or only dial-up access" includes households where no member accesses the Internet at home as well as households where members access the Internet only with a dial-up service. In 2015, about 78 percent of students ages 5 to 17 had access at home to the Internet through fixed broadband of any sort, 7 percent had access to the Internet through mobile broadband alone or with dial-up access, 4 percent only had access to the Internet without a subscription, and 11 percent of students had no access to the Internet or only dial-up access.

Figure 11.1. Percentage distribution of students 5 to 17 years old, by internet access at home and locale: 2015



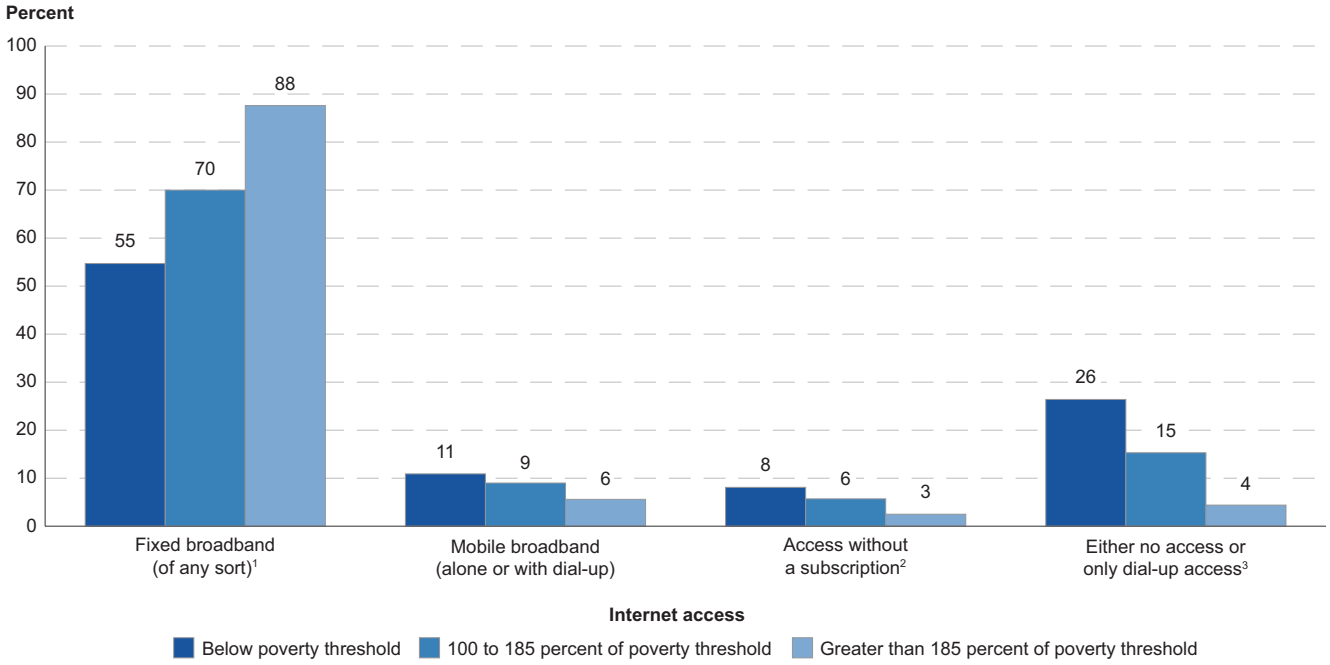
[1] Excludes mobile broadband, but includes all other non-dial-up internet service, such as DSL, cable modem, and fiber-optic cable.
[2] Includes respondents living in a city or town that provides free internet services for its residents.
[3] Includes households where no member accesses the Internet at home as well as households where members access the Internet only with a dial-up service.
NOTE: Data are based on sample surveys of the entire population residing within the United States. However, this figure includes only students living in households, because respondents living in group quarters (e.g., shelters, healthcare facilities, or correctional facilities) were not asked about internet access. Some students living in households were also excluded from this figure, because their poverty status could not be determined. Detail may not sum to totals because of rounding.
SOURCE: U.S. Department of Commerce, Census Bureau, American Community Survey (ACS), 2015. See *Digest of Education Statistics 2016*, table 218.70.

In 2015, the percentage of 5- to 17-year-old students with fixed broadband access at home varied based on the locale in which their home was situated. The percentage of students with fixed broadband access at home was highest for students in suburban areas (84 percent), followed by students in cities (74 percent), and was lowest for students in towns (72 percent) and rural areas (71 percent). The percentage was lowest for students living in remote rural areas (65 percent), compared with students living in large suburbs (85 percent), midsize suburbs (82 percent), small suburbs (81 percent), small cities, fringe towns, and fringe rural areas (77 percent each), midsize cities (76 percent), large cities (72 percent), remote towns (71 percent), distant towns (70 percent), and distant rural areas (66 percent). The percentage of students with fixed broadband access at home was also lower for students living in distant rural areas (66 percent) than in all other detailed locales, with the exception of remote rural areas.

In 2015, the percentage of 5- to 17-year-old students with mobile broadband access alone or with dial-up access at home also varied by locale, but contrasted with patterns observed for fixed broadband access at home. The percentage of students with mobile broadband access at home was highest for students in rural areas (10 percent), followed by students in towns (9 percent), then students in cities (8 percent), and was lowest for students in suburban areas (5 percent). The percentage was higher for students living in distant rural areas (12 percent) than in all other detailed locales, with the percentages ranging from 5 percent in large suburbs to 11 percent in remote rural areas. The percentage of students with mobile broadband access at home was also higher for students living in remote rural areas (11 percent) than in all other detailed locales, with the exception of distant rural areas.

The percentage of 5- to 17-year-old students with either no internet access or only dial-up access at home in 2015 also varied by locale. The percentage of students with either no internet access or only dial-up access at home was higher for students in towns (14 percent) and rural areas and cities (13 percent each) than for students in suburban areas (7 percent). The percentage was higher for students living in remote rural areas (18 percent) than for those living in all other detailed locales, with the percentages ranging from 7 percent in large suburbs to 16 percent in distant rural areas.

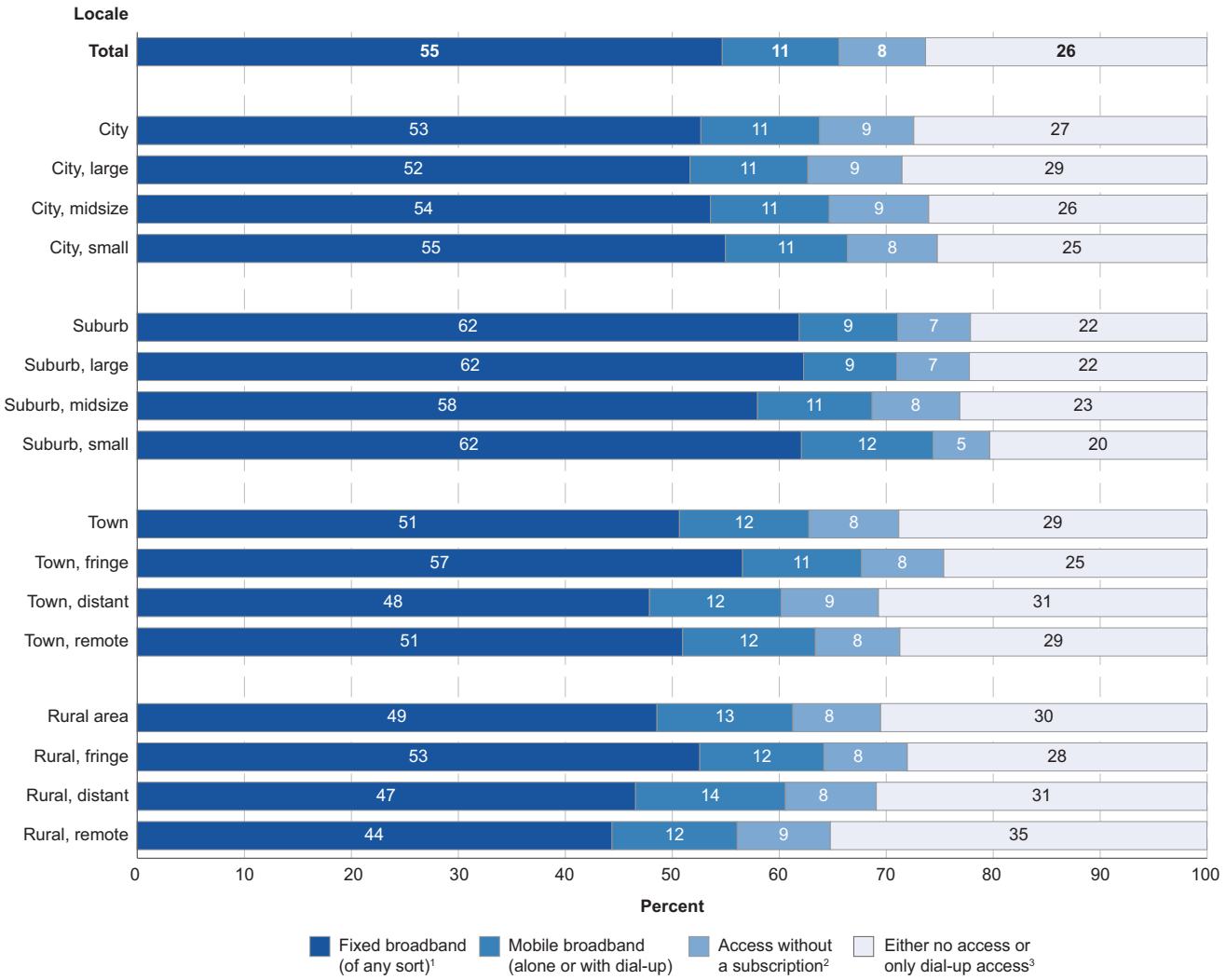
Figure 11.2. Percentage of students 5 to 17 years old, by internet access at home and poverty level: 2015



[1] Excludes mobile broadband, but includes all other non-dial-up internet service, such as DSL, cable modem, and fiber-optic cable.
[2] Includes respondents living in a city or town that provides free internet services for its residents.
[3] Includes households where no member accesses the Internet at home as well as households where members access the Internet only with a dial-up service.
NOTE: Data are based on sample surveys of the entire population residing within the United States. However, this figure includes only students living in households, because respondents living in group quarters (e.g., shelters, healthcare facilities, or correctional facilities) were not asked about internet access. Some students living in households were also excluded from this figure, because their poverty status could not be determined. Detail may not sum to totals because of rounding.
SOURCE: U.S. Department of Commerce, Census Bureau, American Community Survey (ACS), 2015. See *Digest of Education Statistics 2016*, table 218.70.

The percentage of 5- to 17-year-old students with different types of internet access or no internet access at home in 2015 varied by poverty status. For example, the percentage of students who had internet access at home through fixed broadband of any sort was lower for students living below the poverty threshold (55 percent) than for students living between 100 and 185 percent of the poverty threshold (70 percent) and at greater than 185 percent of the poverty threshold (88 percent). In contrast, the percentage of students who had no access to the Internet or only dial-up access was higher for students living below the poverty threshold (26 percent) than for students living between 100 and 185 percent of the poverty threshold (15 percent) and at greater than 185 percent of the poverty threshold (4 percent).

Figure 11.3. Percentage distribution of students 5 to 17 years old living in families below the poverty threshold, by internet access at home and locale: 2015

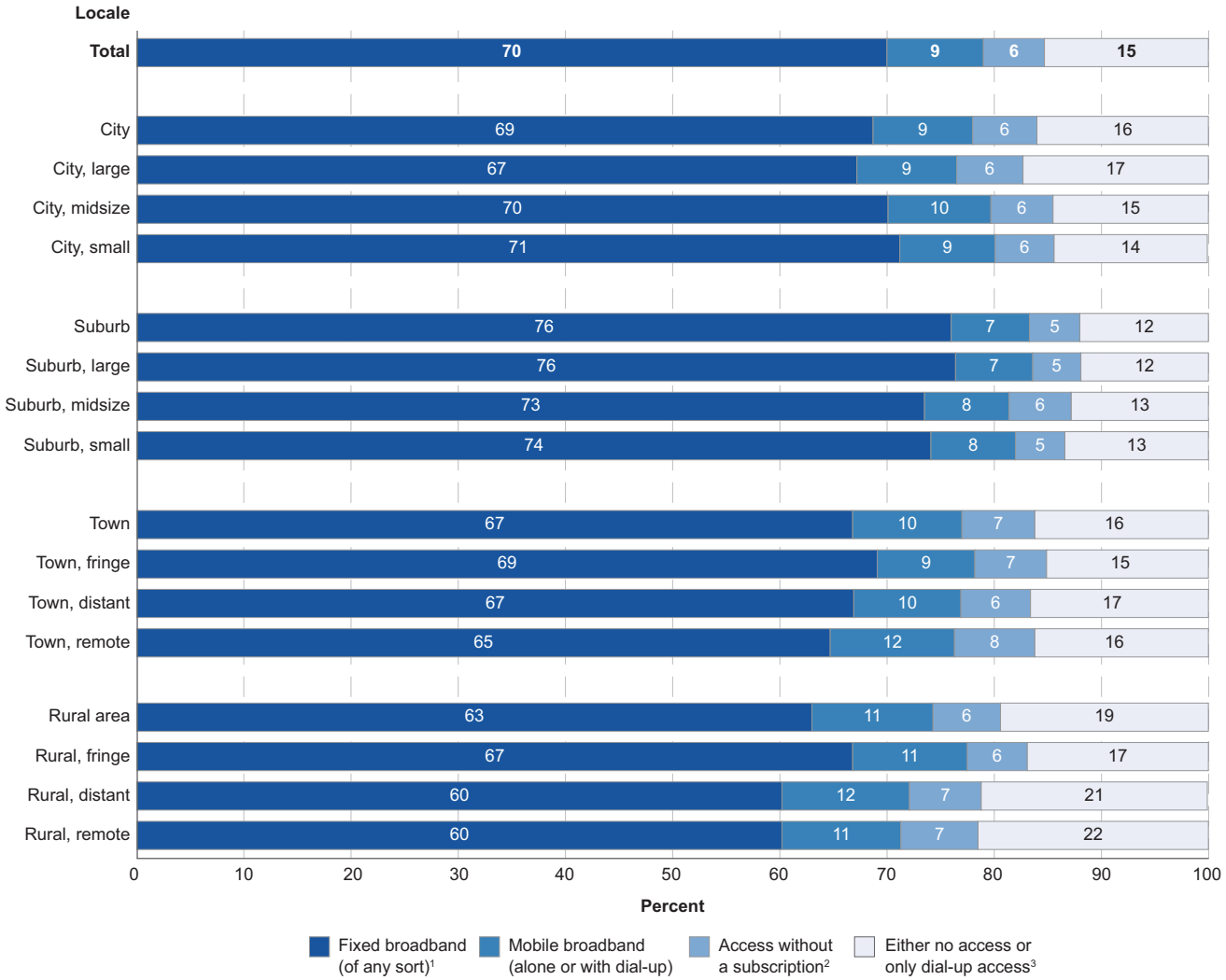


[1] Excludes mobile broadband, but includes all other non-dial-up internet service, such as DSL, cable modem, and fiber-optic cable.
[2] Includes respondents living in a city or town that provides free internet services for its residents.
[3] Includes households where no member accesses the Internet at home as well as households where members access the Internet only with a dial-up service.
NOTE: Data are based on sample surveys of the entire population residing within the United States. However, this figure includes only students living in households, because respondents living in group quarters (e.g., shelters, healthcare facilities, or correctional facilities) were not asked about internet access. Some students living in households were also excluded from this figure, because their poverty status could not be determined. The Census Bureau determines poverty status using a set of money income thresholds that vary by family size and composition. For additional information about poverty status, see https://www.census.gov/topics/income-poverty/poverty/guidance/poverty-measures.html. Detail may not sum to totals because of rounding.
SOURCE: U.S. Department of Commerce, Census Bureau, American Community Survey (ACS), 2015. See *Digest of Education Statistics 2016*, table 218.70.

The percentage of 5- to 17-year-old students living below the poverty threshold with fixed broadband access at home in 2015 varied by locale. The percentage of students with fixed broadband access at home was highest for students in suburban areas (62 percent), followed by students in cities (53 percent), then students in towns (51 percent), and was lowest for students in rural areas (49 percent). The percentages were lower for students living in distant towns (48 percent), distant rural areas (47 percent), and remote rural areas (44 percent) than for those living in all other detailed locales, with the percentages ranging from 51 percent in remote towns to 62 percent each in small and large suburbs.

The percentage of 5- to 17-year-old students living below the poverty threshold with either no internet access or only dial-up access at home in 2015 also varied based on locale, but contrasted with patterns for those with fixed broadband access at home. The percentage of students with either no access or only dial-up access at home was highest for students in rural areas (30 percent), followed by students in towns (29 percent), then students in cities (27 percent), and was lowest for students in suburban areas (22 percent). The percentage was higher for students living in remote rural areas (35 percent) than for those living in all other detailed locales, with the percentages ranging from 20 percent in small suburbs to 31 percent each in distant towns and distant rural areas.

Figure 11.4. Percentage distribution of students 5 to 17 years old living in families between 100 and 185 percent of the poverty threshold, by internet access at home and locale: 2015

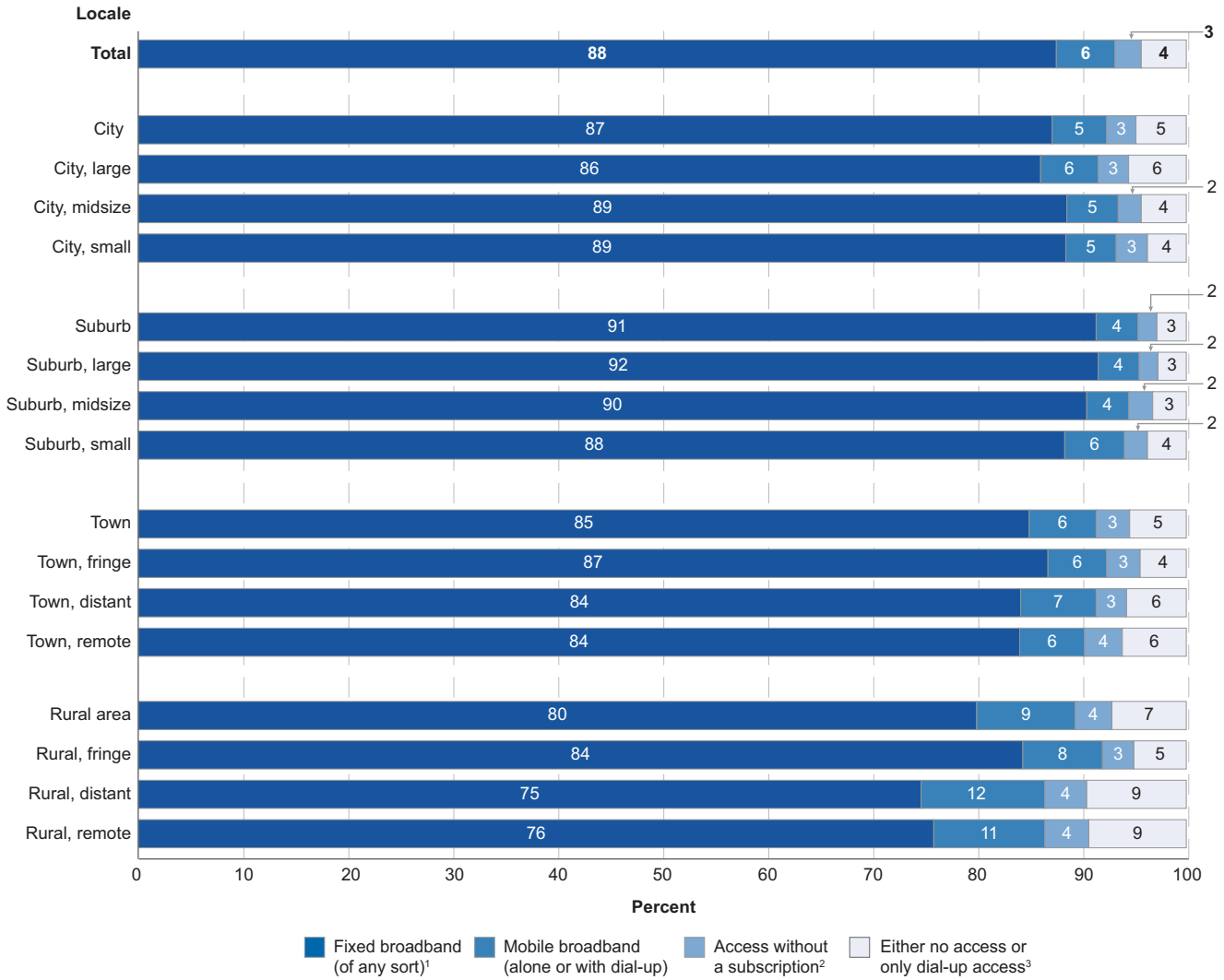


[1] Excludes mobile broadband, but includes all other non-dial-up internet service, such as DSL, cable modem, and fiber-optic cable.
[2] Includes respondents living in a city or town that provides free internet services for its residents.
[3] Includes households where no member accesses the Internet at home as well as households where members access the Internet only with a dial-up service.
NOTE: Data are based on sample surveys of the entire population residing within the United States. However, this figure includes only students living in households, because respondents living in group quarters (e.g., shelters, healthcare facilities, or correctional facilities) were not asked about internet access. Some students living in households were also excluded from this figure, because their poverty status could not be determined. The Census Bureau determines poverty status using a set of money income thresholds that vary by family size and composition. For additional information about poverty status, see https://www.census.gov/topics/income-poverty/poverty/guidance/poverty-measures.html. Detail may not sum to totals because of rounding.
SOURCE: U.S. Department of Commerce, Census Bureau, American Community Survey (ACS), 2015. See *Digest of Education Statistics 2016*, table 218.70.

The percentage of 5- to 17-year-old students living between 100 and 185 percent of the poverty threshold with fixed broadband access at home in 2015 varied by locale. The percentage of students with fixed broadband access at home was highest for students in suburban areas (76 percent), followed by students in cities (69 percent), then students in towns (67 percent), and was lowest for students in rural areas (63 percent). The percentage was lower for students living in remote and distant rural areas (60 percent each) than for those living in all other detailed locales, with the percentages ranging from 65 percent in remote towns to 76 percent in large suburbs.

The percentage of 5- to 17-year-old students living between 100 and 185 percent of the poverty threshold with either no access or only dial-up access at home in 2015 also varied by locale, but contrasted with patterns for those with fixed broadband access at home. The percentage of students with either no access or only dial-up access at home was highest for students in rural areas (19 percent), followed by students in towns and cities (16 percent each), and was lowest for students in suburban areas (12 percent). The percentage of 5- to 17-year-old students living between 100 and 185 percent of the poverty threshold with either no internet access or only dial-up access at home was higher for students living in remote rural areas (22 percent) and distant rural areas (21 percent) than for those living in all other detailed locales, with the percentages ranging from 12 percent in large suburbs to 17 percent each in large cities, distant towns, and fringe rural areas.

Figure 11.5. Percentage distribution of students 5 to 17 years old living in families at greater than 185 percent of the poverty threshold, by internet access at home and locale: 2015



[1] Excludes mobile broadband, but includes all other non-dial-up internet service, such as DSL, cable modem, and fiber-optic cable.
[2] Includes respondents living in a city or town that provides free internet services for its residents.
[3] Includes households where no member accesses the Internet at home as well as households where members access the Internet only with a dial-up service.
NOTE: Data are based on sample surveys of the entire population residing within the United States. However, this figure includes only students living in households, because respondents living in group quarters (e.g., shelters, healthcare facilities, or correctional facilities) were not asked about internet access. Some students living in households were also excluded from this figure, because their poverty status could not be determined. The Census Bureau determines poverty status using a set of money income thresholds that vary by family size and composition. For additional information about poverty status, see https://www.census.gov/topics/income-poverty/poverty/guidance/poverty-measures.html. Detail may not sum to totals because of rounding.
SOURCE: U.S. Department of Commerce, Census Bureau, American Community Survey (ACS), 2015. See *Digest of Education Statistics 2016*, table 218.70.

The percentage of 5- to 17-year-old students living at greater than 185 percent of the poverty threshold with fixed broadband access at home in 2015 varied by locale. The percentage of students with fixed broadband access at home was highest for students in suburban areas (91 percent), followed by students in cities (87 percent), then students in towns (85 percent), and was lowest for students in rural areas (80 percent). The percentage was lower for students living in remote rural areas (76 percent) and distant rural areas (75 percent) than in all other detailed locales, with the percentages ranging from 84 percent each in distant and remote towns and fringe rural areas to 92 percent in large suburbs.

The percentage of 5- to 17-year-old students living at greater than 185 percent of the poverty threshold with either no internet access or only dial-up access at home in 2015 also varied based by locale, but contrasted with patterns for those with fixed broadband access at home. The percentage of students with either no access or only dial-up access at home was higher for students in rural areas (7 percent) than for students in towns and cities (5 percent each), and was lowest for students in suburbs (3 percent). The percentage of 5- to 17-year-old students living at greater than 185 percent of the poverty threshold with either no internet access or only dial-up access at home was higher for students living in remote and distant rural areas (9 percent each) than for those living in all other detailed locales, with the percentages ranging from 3 percent each in midsize and large suburbs to 6 percent each in large cities and remote and distant towns.

Across cities, suburban areas, towns, and rural areas in 2015, the percentages of 5- to 17-year-old students with either no internet access or only dial-up access were consistently higher for students living below the poverty threshold than for students living at greater than 185 percent of the poverty threshold. In contrast, across all locales the percentages of students with fixed broadband access at home were consistently lower for students living below the poverty threshold than for students living at greater than 185 percent of the poverty threshold.

Endnotes:

[1] Students are considered to be in poverty if their family income falls below the Census Bureau's poverty threshold, which is a dollar amount that varies depending on a family's size and composition and is updated annually to account for inflation. In 2015, for example, the poverty threshold for a family of four with two children was $24,036. Respondents were interviewed throughout the year and reported on the income they received during the previous 12 months.

[2] Includes respondents living in a city or town that provides free internet services for its residents.

Reference tables: Table 11.1.

Indicator 12

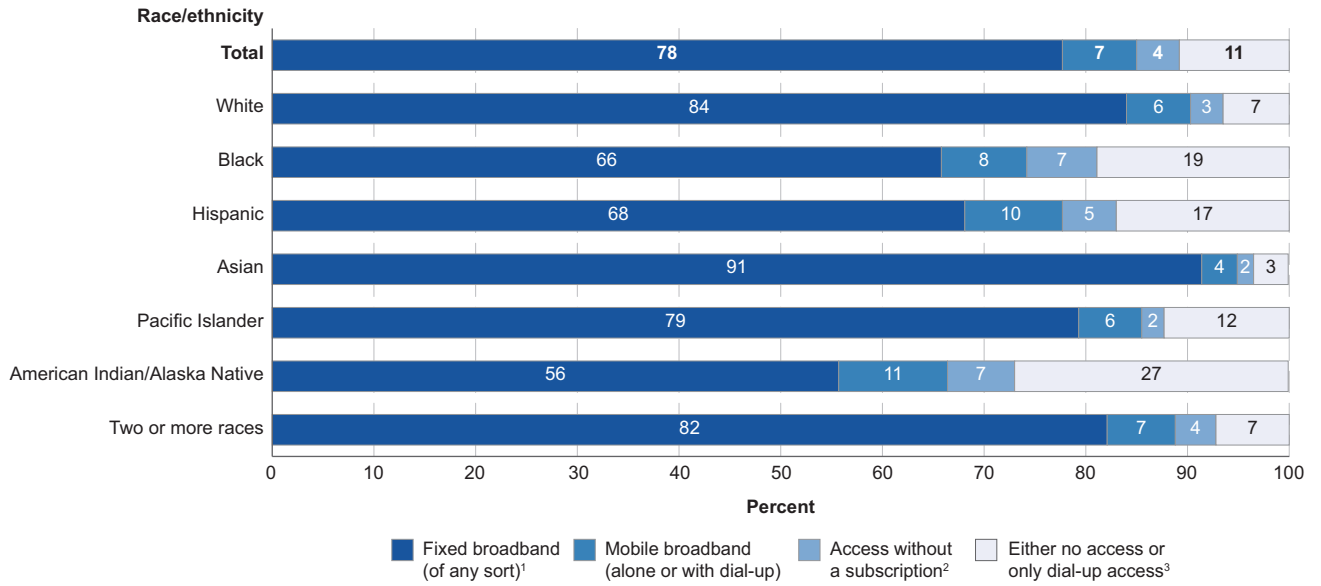
Student Internet Access by Locale and Race/Ethnicity

In 2015, the percentage of 5- to 17-year-old students with either no access to the internet at home or only dial-up access varied by race/ethnicity. In remote rural areas, the percentage of students who had either no internet access or only dial-up access at home were higher for Black (41 percent) and Hispanic students (26 percent) than for White (13 percent) and Asian students (11 percent).

Studies have shown that differences in home internet access exist across students with different characteristics, including race/ethnicity and geographic locale (File and Ryan 2014; Horrigan and Duggan 2015). This indicator uses data from the American Community Survey to examine the percentages of students ages 5 to 17 with home internet access in 2015, by type of access, race/ethnicity, and geographic locale.

Students can access the Internet from home through different methods, such as a broadband subscription, either fixed or mobile, or even without a subscription.[1] Fixed broadband (of any sort) excludes mobile broadband, but includes all other non-dial-up internet service, such as DSL, cable modem, fiber-optic cable, and satellite internet service. Mobile broadband includes computer and cell phone plans. In this indicator, mobile broadband includes households with mobile broadband either alone or with dial-up access at home. In addition, "either no access to the Internet or only dial-up access" includes households where no member accesses the Internet at home as well as households where members access the Internet only with a dial-up service. In 2015, about 78 percent of students ages 5 to 17 had access at home to the Internet through fixed broadband of any sort, 7 percent had access to the Internet through mobile broadband alone or with dial-up access, 4 percent only had access to the Internet without a subscription, and 11 percent of students had either no access to the Internet or only dial-up access.

Figure 12.1. Percentage distribution of students 5 to 17 years old, by race/ethnicity and internet access at home: 2015

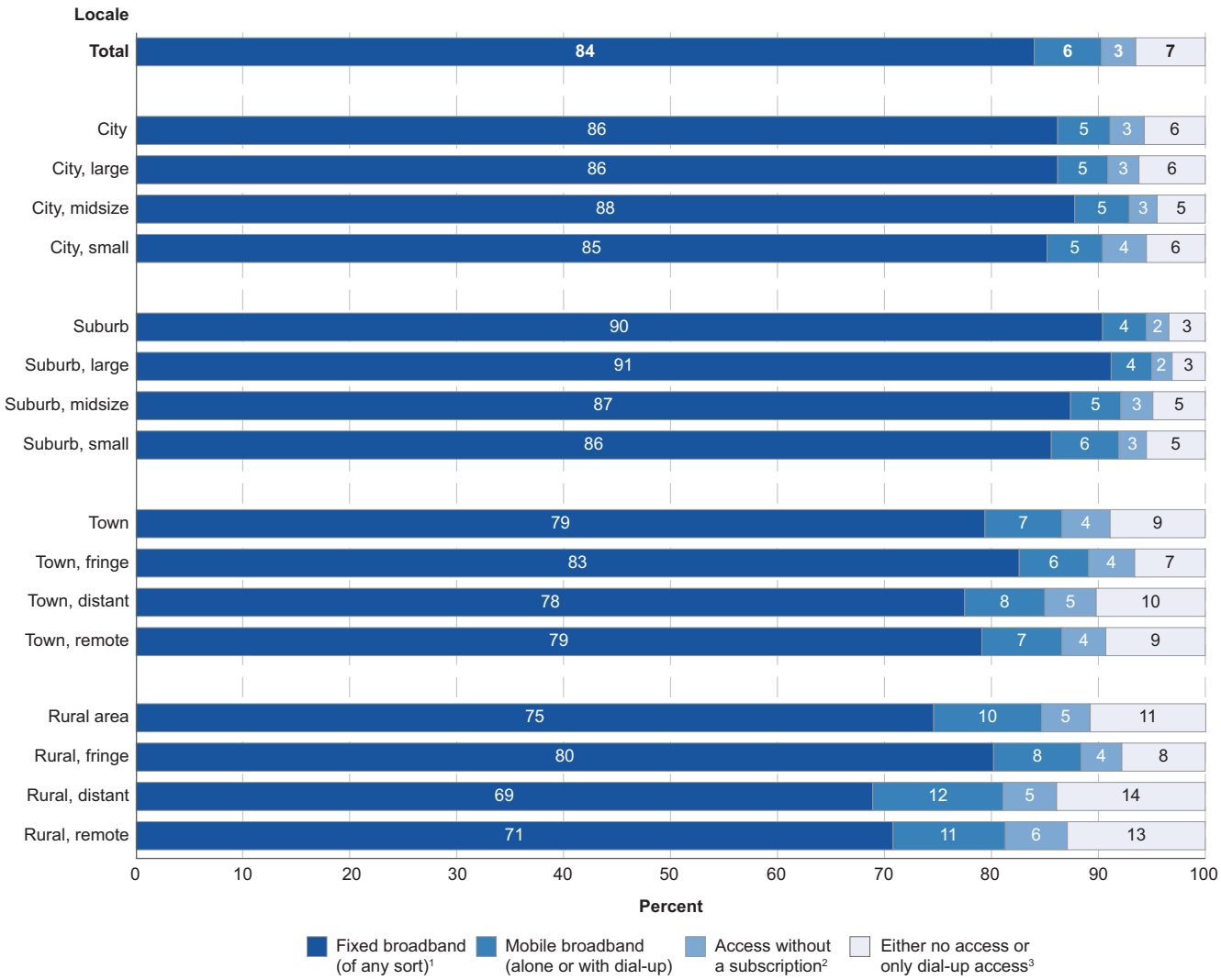


[1] Excludes mobile broadband, but includes all other non-dial-up internet service, such as DSL, cable modem, and fiber-optic cable.
[2] Includes respondents living in a city or town that provides free internet services for its residents.
[3] Includes households where no member accesses the Internet at home as well as households where members access the Internet only with a dial-up service.
NOTE: Data are based on sample surveys of the entire population residing within the United States. However, this figure includes only students living in households, because respondents living in group quarters (e.g., shelters, healthcare facilities, or correctional facilities) were not asked about internet access. Race categories exclude persons of Hispanic ethnicity. Detail may not sum to totals because of rounding.
SOURCE: U.S. Department of Commerce, Census Bureau, American Community Survey (ACS), 2015. See *Digest of Education Statistics 2016*, table 218.71.

In 2015, the percentages of 5- to 17-year-old students with fixed broadband access, mobile broadband alone or with dial-up access, and either no access to the Internet or only dial-up access at home varied by race/ethnicity. The percentage of students with fixed broadband access at home was highest for Asian students (91 percent), followed by White students (84 percent), students of Two or more races (82 percent), Hispanic students (68 percent), Black students (66 percent), and American Indian/Alaska Native students (56 percent). The percentage of Pacific Islander students with fixed broadband access at home (79 percent) was also higher than the percentages of Black and American Indian/Alaska Native students, but was not measurably different from the percentages of White students or students of Two or more races.

The percentage of students with mobile broadband alone or with dial-up access at home also varied by race/ethnicity, but the pattern of access contrasted with that for fixed broadband access at home. The percentage of students with mobile broadband at home was highest for American Indian/Alaska Native (11 percent) and Hispanic (10 percent) students; followed by Black students (8 percent); then by students of Two or more races (7 percent), White, and Pacific Islander students (6 percent each); and was lowest for Asian students (4 percent). No measurable differences were found between the percentages of Black and Pacific Islander students. In addition, no measurable differences were found between the percentages for students of Two or more races and White and Pacific Islander students. Finally, the percentage of students with either no internet access or only dial-up access at home in 2015 was highest for American Indian/Alaska Native students (27 percent), then Black students (19 percent), then Hispanic students (17 percent), then Pacific Islander students (12 percent), then White students and students of Two or more races (7 percent each), and then Asian students (3 percent).

Figure 12.2. Percentage distribution of White students 5 to 17 years old, by internet access at home and locale: 2015



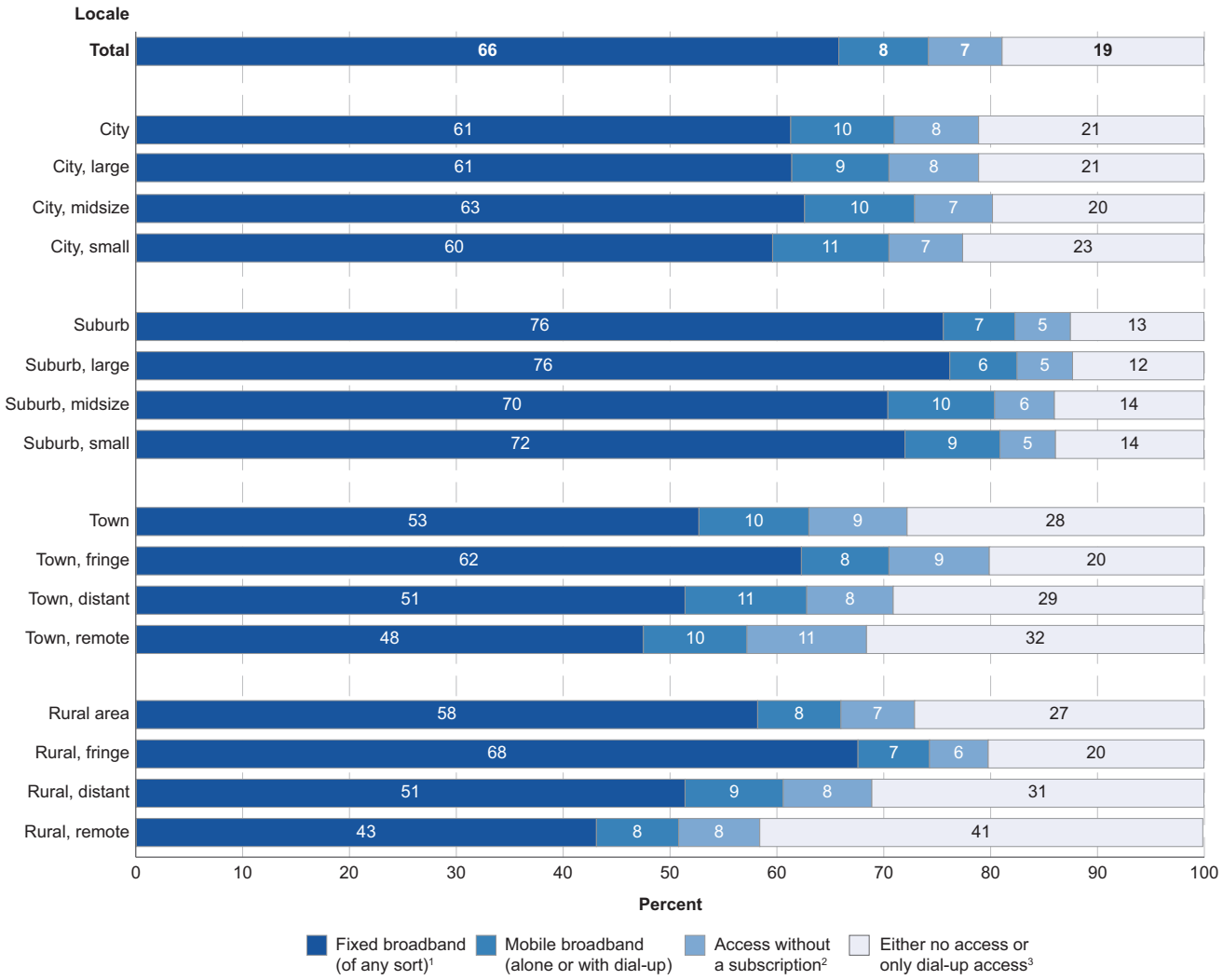
[1] Excludes mobile broadband, but includes all other non-dial-up internet service, such as DSL, cable modem, and fiber-optic cable.
[2] Includes respondents living in a city or town that provides free internet services for its residents.
[3] Includes households where no member accesses the Internet at home as well as households where members access the Internet only with a dial-up service.
NOTE: Data are based on sample surveys of the entire population residing within the United States. However, this figure includes only students living in households, because respondents living in group quarters (e.g., shelters, healthcare facilities, or correctional facilities) were not asked about internet access. Race categories exclude persons of Hispanic ethnicity. Detail may not sum to totals because of rounding.
SOURCE: U.S. Department of Commerce, Census Bureau, American Community Survey (ACS), 2015. See *Digest of Education Statistics 2016*, table 218.71.

In 2015, about 84 percent of 5- to 17-year-old White students had access at home to the Internet through fixed broadband of any sort, 6 percent had access to the Internet through mobile broadband alone or with dial-up access, 3 percent had access to the Internet without a subscription, and 7 percent of White students either had no access to the Internet or only dial-up access.

In 2015, the percentage of 5- to 17-year-old White students with fixed broadband access at home varied based on the locale in which their home was situated. The percentage of White students with fixed broadband access at home was highest in suburban areas (90 percent), followed by cities (86 percent), then towns (79 percent), and was lowest in rural areas (75 percent). The percentage was lowest for White students living in distant rural areas (69 percent) than for those living in remote rural areas (71 percent), distant towns (78 percent), remote towns (79 percent), fringe rural areas (80 percent), fringe towns (83 percent), small cities (85 percent), large cities and small suburbs (86 percent each), midsize suburbs (87 percent), midsize cities (88 percent), and large suburbs (91 percent). The percentage of students with fixed broadband access at home was also lower for students living in remote rural areas (71 percent) than in all other detailed locales, with the exception of distant rural areas.

The percentage of 5- to 17-year-old White students with either no internet access or only dial-up access at home in 2015 also varied by locale, but the pattern of access contrasted with that for fixed broadband access at home. The percentage of White students with either no internet access or only dial-up access at home was highest in rural areas (11 percent), followed by towns (9 percent), then cities (6 percent), and was lowest in suburban areas (3 percent). The percentage was higher for students living in distant rural areas (14 percent) than for those living in all other detailed locales, with the percentages ranging from 3 percent in large suburbs to 13 percent in remote rural areas.

Figure 12.3. Percentage distribution of Black students 5 to 17 years old, by internet access at home and locale: 2015



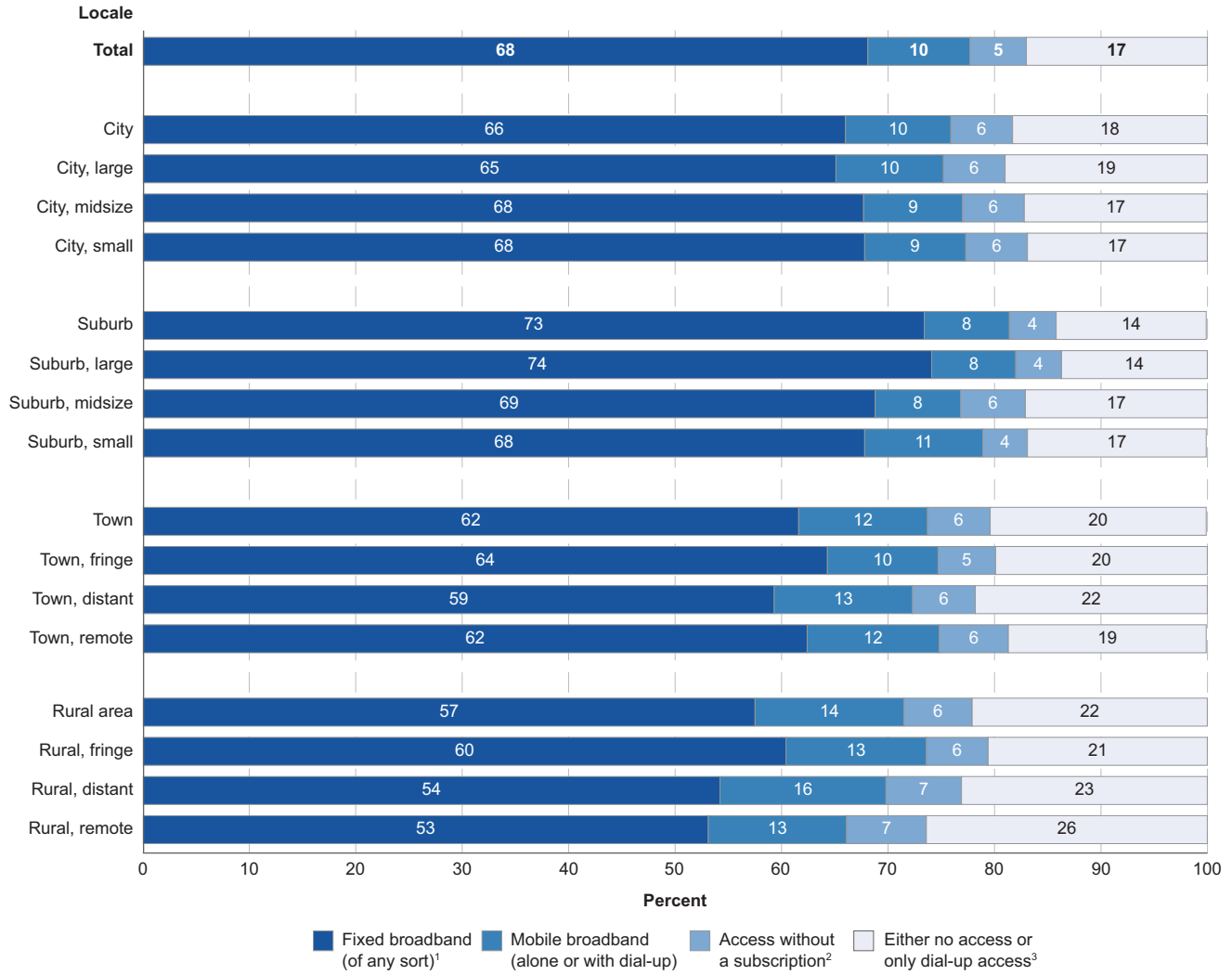
[1] Excludes mobile broadband, but includes all other non-dial-up internet service, such as DSL, cable modem, and fiber-optic cable.
[2] Includes respondents living in a city or town that provides free internet services for its residents.
[3] Includes households where no member accesses the Internet at home as well as households where members access the Internet only with a dial-up service.
NOTE: Data are based on sample surveys of the entire population residing within the United States. However, this figure includes only students living in households, because respondents living in group quarters (e.g., shelters, healthcare facilities, or correctional facilities) were not asked about internet access. Race categories exclude persons of Hispanic ethnicity. Detail may not sum to totals because of rounding.
SOURCE: U.S. Department of Commerce, Census Bureau, American Community Survey (ACS), 2015. See *Digest of Education Statistics 2016*, table 218.71.

In 2015, about 66 percent of 5- to 17-year-old Black students had access at home to the Internet through fixed broadband of any sort, 8 percent had access to the Internet through mobile broadband alone or with dial-up access, 7 percent had access to the Internet without a subscription, and 19 percent of Black students had either no access to the Internet or only dial-up access.

In 2015, the percentage of 5- to 17-year-old Black students with fixed broadband access at home varied by locale. The percentage of Black students with fixed broadband access at home was highest in suburban areas (76 percent), followed by cities (61 percent), then rural areas (58 percent), and was lowest in towns (53 percent). The percentage was lower for Black students living in remote rural areas (43 percent) than in all other detailed locales with the exception of remote towns, with the percentages ranging from 47 percent in remote towns to 76 percent in large suburbs.

The percentage of 5- to 17-year-old Black students with either no internet access or only dial-up access at home in 2015 also varied by locale, but the pattern of access contrasted with that for fixed broadband access at home. The percentage of Black students with either no internet access or only dial-up access at home was highest in towns (28 percent) and rural areas (27 percent), followed by cities (21 percent), and was lowest in suburban areas (13 percent). The percentage was higher for Black students living in remote rural areas (41 percent) than for those living in all other detailed locales, with the percentages ranging from 12 percent in large suburbs to 32 percent in remote towns.

Figure 12.4. Percentage distribution of Hispanic students 5 to 17 years old, by internet access at home and locale: 2015



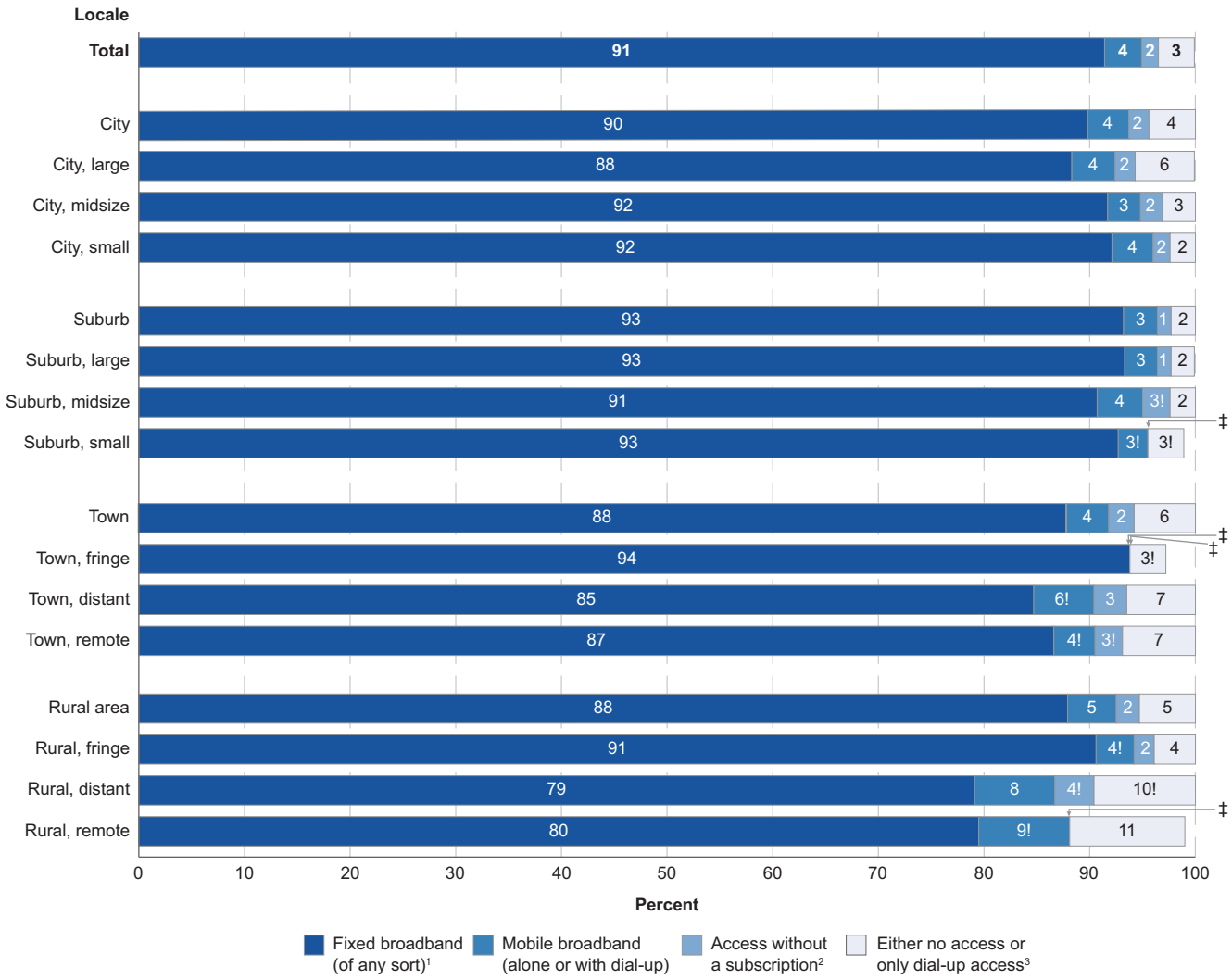
[1] Excludes mobile broadband, but includes all other non-dial-up internet service, such as DSL, cable modem, and fiber-optic cable.
[2] Includes respondents living in a city or town that provides free internet services for its residents.
[3] Includes households where no member accesses the Internet at home as well as households where members access the Internet only with a dial-up service.
NOTE: Data are based on sample surveys of the entire population residing within the United States. However, this figure includes only students living in households, because respondents living in group quarters (e.g., shelters, healthcare facilities, or correctional facilities) were not asked about internet access. Detail may not sum to totals because of rounding.
SOURCE: U.S. Department of Commerce, Census Bureau, American Community Survey (ACS), 2015. See *Digest of Education Statistics 2016*, table 218.71.

In 2015, about 68 percent of 5- to 17-year-old Hispanic students had access at home to the Internet through fixed broadband of any sort, 10 percent had access to the Internet through mobile broadband alone or with dial-up access, 5 percent had access to the Internet without a subscription, and 17 percent of Hispanic students had either no access to the Internet or only dial-up access.

In 2015, the percentage of 5- to 17-year-old Hispanic students with fixed broadband access at home varied by locale. The percentage of Hispanic students with fixed broadband access at home was highest in suburban areas (73 percent), followed by cities (66 percent), then towns (62 percent), and was lowest in rural areas (57 percent). The percentage of 5- to 17-year-old Hispanic students with fixed broadband access at home was lower for students living in remote rural (53 percent) and distant rural (54 percent) areas than for those living in all other detailed locales, with the percentages ranging from 59 percent in distant towns to 74 percent in large suburbs.

The percentage of 5- to 17-year-old Hispanic students with either no internet access or only dial-up access at home in 2015 also varied by locale, but the pattern of access contrasted with that for fixed broadband access at home. The percentage of Hispanic students with either no internet access or only dial-up access at home was highest in rural areas (22 percent), followed by towns (20 percent), then cities (18 percent), and was lowest in suburban areas (14 percent). The percentage was higher for students living in remote rural areas (26 percent) than for those living in all other detailed locales with the exception of distant rural areas (23 percent), with the percentages ranging from 14 percent in large suburbs to 22 percent in distant towns.

Figure 12.5. Percentage distribution of Asian students 5 to 17 years old, by internet access at home and locale: 2015



! Interpret data with caution. The coefficient of variation (CV) for this estimate is between 30 and 50 percent.
‡ Reporting standards not met. Either there are too few cases for a reliable estimate or the coefficient of variation (CV) is 50 percent or greater.
[1] Excludes mobile broadband, but includes all other non-dial-up internet service, such as DSL, cable modem, and fiber-optic cable.
[2] Includes respondents living in a city or town that provides free internet services for its residents.
[3] Includes households where no member accesses the Internet at home as well as households where members access the Internet only with a dial-up service.
NOTE: Data are based on sample surveys of the entire population residing within the United States. However, this figure includes only students living in households, because respondents living in group quarters (e.g., shelters, healthcare facilities, or correctional facilities) were not asked about internet access. Race categories exclude persons of Hispanic ethnicity. Detail may not sum to totals because of rounding.
SOURCE: U.S. Department of Commerce, Census Bureau, American Community Survey (ACS), 2015. See *Digest of Education Statistics 2016*, table 218.71.

In 2015, about 91 percent of 5- to 17-year-old Asian students had access at home to the Internet through fixed broadband of any sort, 4 percent had access to the Internet through mobile broadband alone or with dial-up access, 2 percent had access to the Internet without a subscription, and 3 percent of Asian students either had no access to the Internet or only dial-up access.

In 2015, the percentage of 5- to 17-year-old Asian students with fixed broadband access at home varied by locale. The percentage of Asian students with fixed broadband access at home was higher in suburban areas (93 percent) than in cities (90 percent) and rural areas and towns (88 percent each). The percentage was lower for students living in distant rural (79 percent) and remote rural (80 percent) areas than for those living in all other detailed locales with the exception of distant and remote towns, with the percentages ranging from 88 percent in large cities to 94 percent in fringe towns.

The percentage of 5- to 17-year-old Asian students with either no internet access or only dial-up access at home in 2015 also varied by locale, but the pattern of access contrasted with that for fixed broadband access at home. The percentage of Asian students with either no internet access or only dial-up access at home was higher in towns (6 percent), rural areas (5 percent), and cities (4 percent) than in suburban areas (2 percent). The percentage was higher for students living in remote rural areas (11 percent) than for those living in all other detailed locales with the exception of large cities, distant rural areas, distant towns, and remote towns, with the percentages ranging from 2 percent each in small cities and large and midsize suburbs to 3 percent in fringe towns.

In general, the overall racial/ethnic patterns of home internet access for students ages 5 to 17 were also observed across geographic locales. Overall and in cities and towns, the percentage of students with fixed broadband access at home in 2015 was highest for Asian students, followed by White, Hispanic, and then Black students. However, in suburban areas the percentage of students with fixed broadband access at home was higher for Black students than for Hispanic students (76 vs. 73 percent), and in rural areas no measurable differences were observed between the percentages of Black and Hispanic students with fixed broadband access. In cities, towns, and rural areas, the percentage of students with either no internet access or only dial-up access at home in 2015 was highest for Black students, followed by Hispanic, White, and Asian students. However, in suburban areas the percentage of students with either no internet access or only dial-up access at home was higher for Hispanic students than for Black students (14 vs. 13 percent).

Endnotes:

[1] Includes respondents living in a city or town that provides free internet services for its residents.

Reference tables: Table 12.1.

Indicator 13

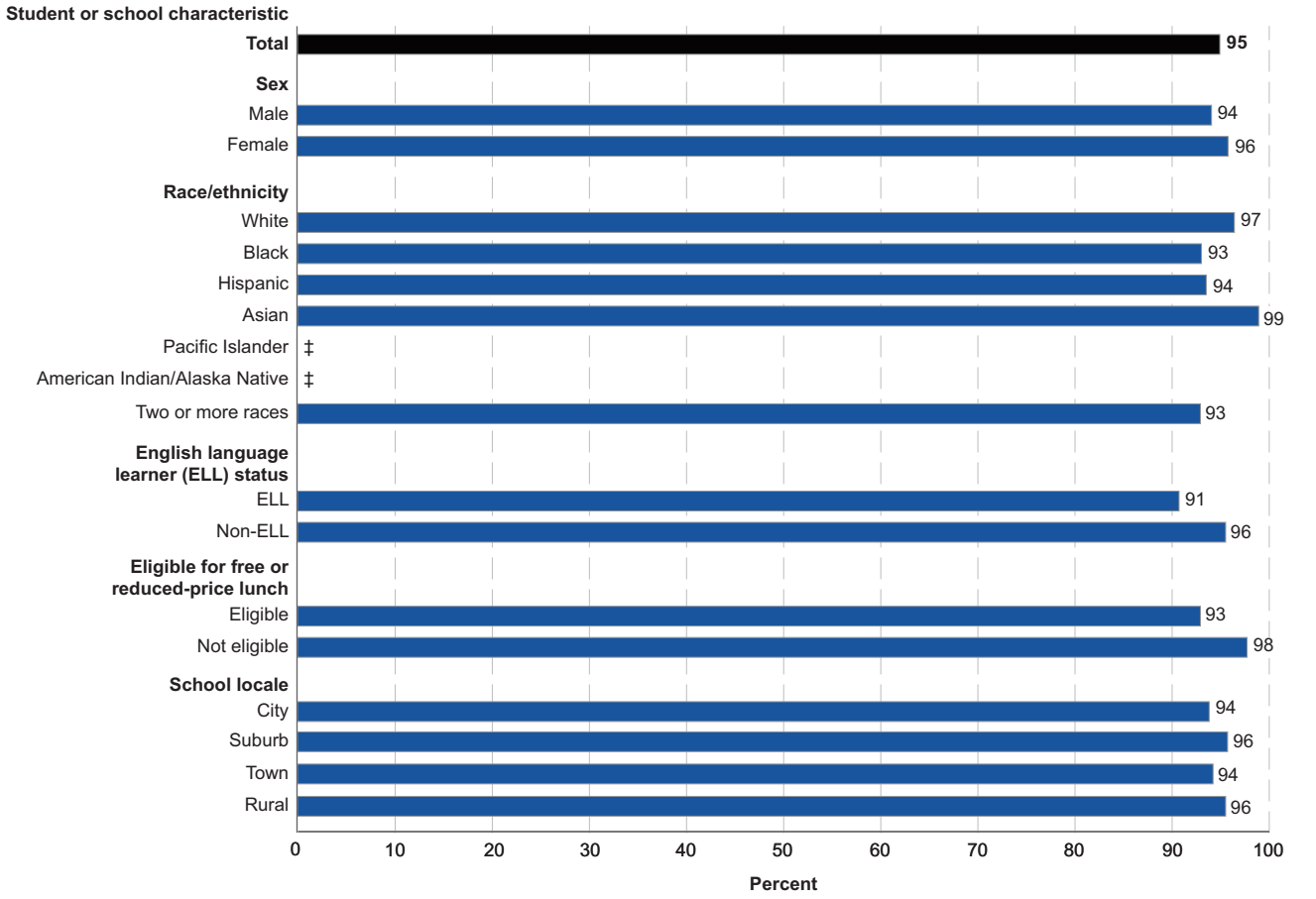
Ownership of Digital Devices

In 2015, higher percentages of 8th- and 12th-grade public school students (98 percent each) than 4th- grade students (95 percent) reported owning or sharing a digital device at home such as a desktop computer, laptop computer, tablet, or smartphone.

Prior research has found that a student's success in using digital learning resources in the classroom is related to their level of practice and knowledge of these resources at home (Henderson 2011). However, students have varying degrees of access at home to digital devices, such as desktop computers, laptop computers, tablets, and smartphones. The Computer Access and Familiarity Study (CAFS) was designed to measure student access to and familiarity with technology. The CAFS was conducted as part of the 2015 National Assessment for Educational Progress (NAEP) and administered to public school students in grades 4, 8, and 12.

This indicator uses the CAFS to examine the percentages of 4th-, 8th-, and 12th-grade public school students with their own or a shared digital device at home, by selected student or school characteristics. In 2015, higher percentages of 8th- and 12th-grade public school students (98 percent each) than 4th-grade students (95 percent) reported owning or sharing a digital device at home. At grades 8 and 12, few measurable differences were found by student and school characteristics because almost all public school students reported that they owned or shared a digital device at home.

Figure 13.1. Percentage of 4th-grade public school students who reported that they owned or shared a digital device at home, by selected student and school characteristics: 2015

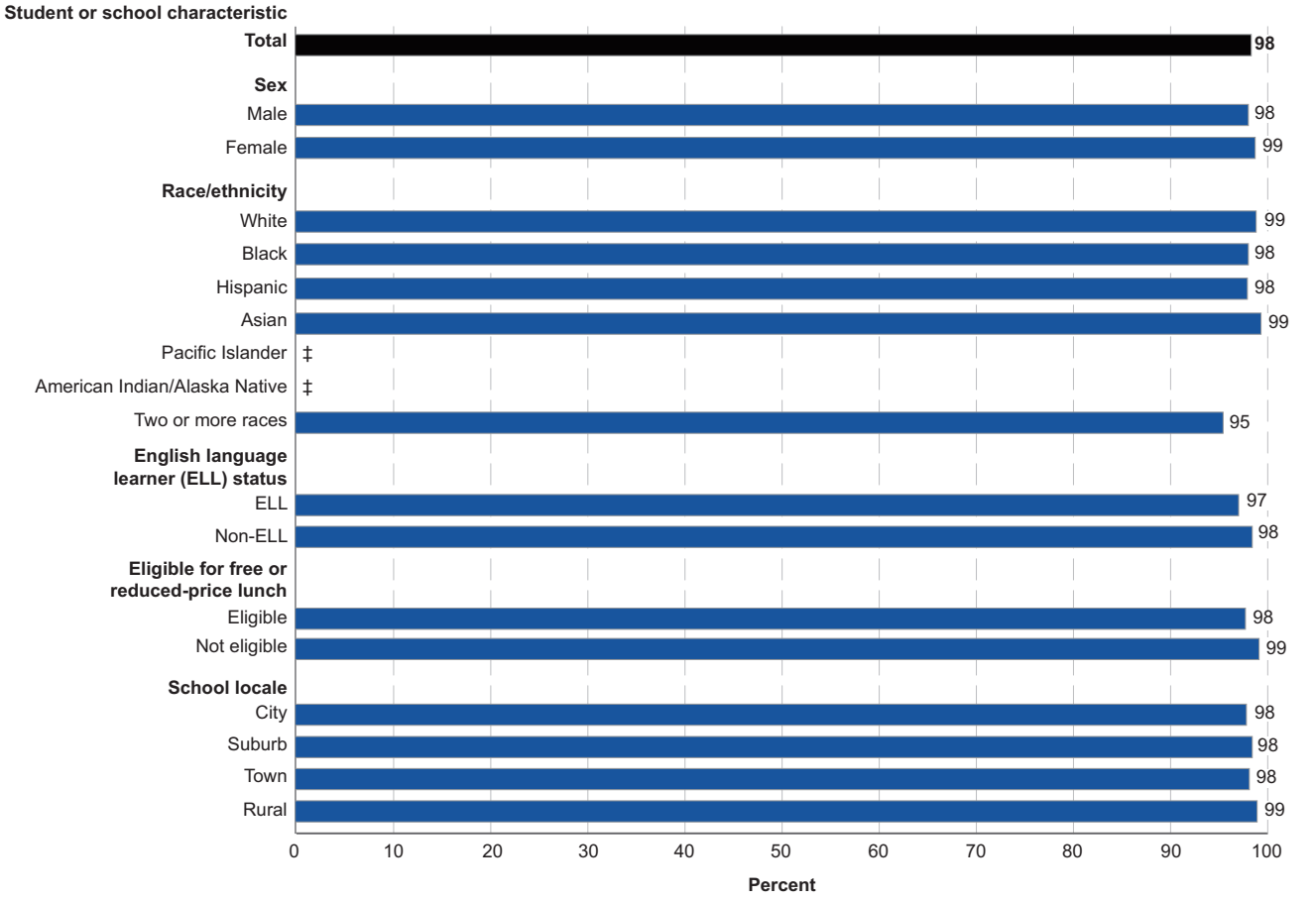


‡ Reporting standards not met (too few cases for a reliable estimate).
NOTE: Digital devices include desktop computers, laptop computers, tablets, and smartphones. Race categories exclude persons of Hispanic ethnicity.
SOURCE: American Institutes for Research, National Assessment of Educational Progress (NAEP) Validity Studies Panel, *Initial Tables From the 2015 Computer Access and Familiarity Study*. See *Digest of Education Statistics 2016*, table 218.40.

At grade 4, the percentage of public school students who reported owning or sharing a digital device at home varied by students' sex, race/ethnicity, English language learner (ELL) status, disability status, eligibility for free or reduced-price lunch, and school locale. In 4th grade, a higher percentage of female students (96 percent) than male students (94 percent) owned or shared a digital device. The percentage of 4th-grade students who reported owning or sharing a digital device at home was higher for Asian students (99 percent) than for students of any other racial/ethnic group. In addition, a higher percentage of White students (97 percent) than Hispanic (94 percent) and Black students (93 percent) owned or shared a digital device. The percentage of 4th-grade students who reported owning or sharing a digital device at home was higher for non-ELL students (96 percent) than for ELL students (91 percent), and also was higher for students without a disability (95 percent) than for students with a disability (92 percent).

In addition, a higher percentage of students not eligible for free or reduced-price lunch (98 percent) than students eligible for free or reduced-price lunch (93 percent) reported owning or sharing a digital device at home. The percentage of students who reported owning or sharing a digital device at home also varied based on the locale in which their school was situated (i.e., located in a city, suburb, town, or rural area). A higher percentage of 4th-grade students in suburban schools (96 percent) than in city schools (94 percent) reported owning or sharing a device at home.

Figure 13.2. Percentage of 8th-grade public school students who reported that they owned or shared a digital device at home, by selected student and school characteristics: 2015

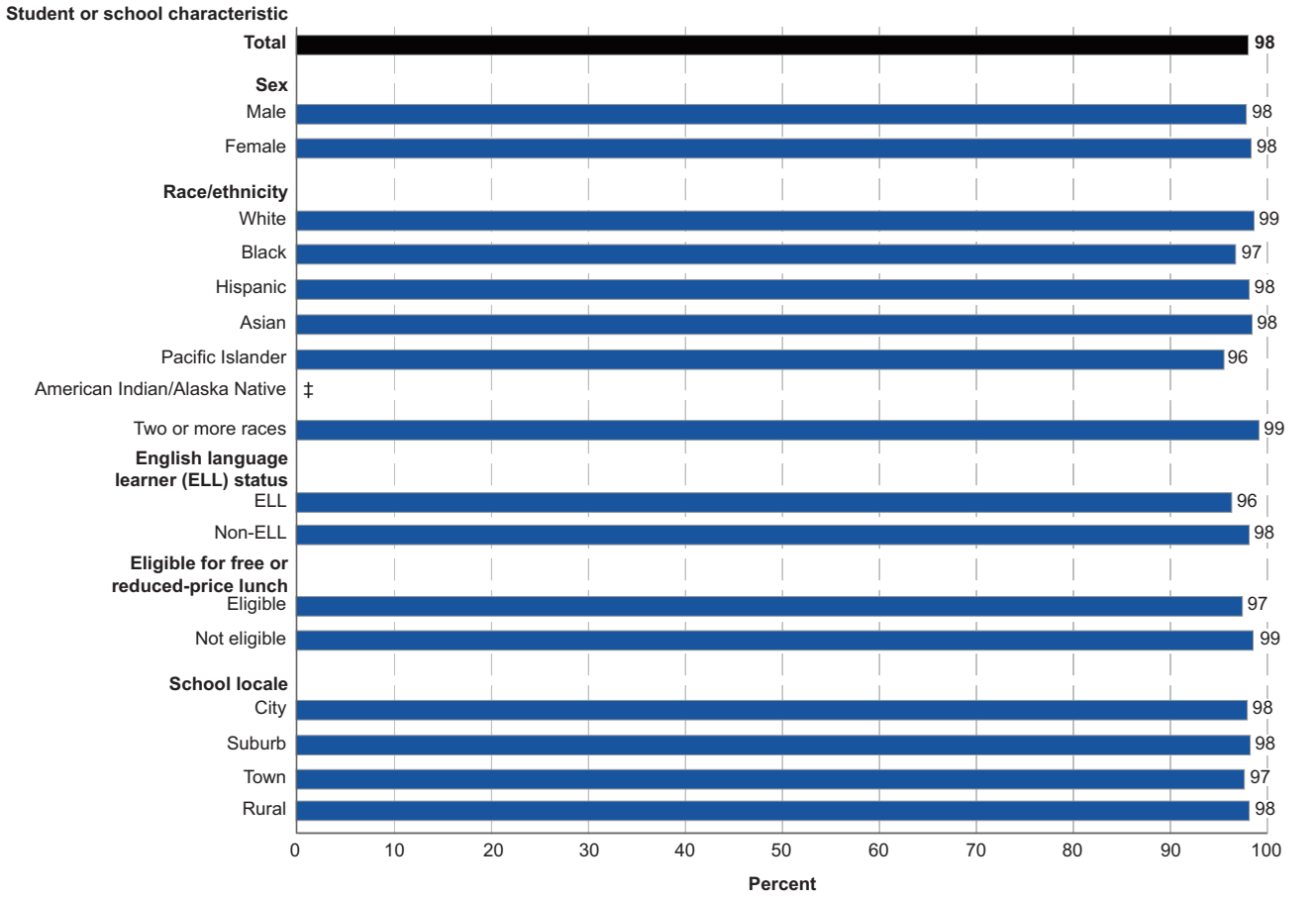


‡ Reporting standards not met (too few cases for a reliable estimate).
NOTE: Digital devices include desktop computers, laptop computers, tablets, and smartphones. Race categories exclude persons of Hispanic ethnicity.
SOURCE: American Institutes for Research, National Assessment of Educational Progress (NAEP) Validity Studies Panel, *Initial Tables From the 2015 Computer Access and Familiarity Study*. See *Digest of Education Statistics 2016*, table 218.40.

At grade 8, differences in the percentages of students who reported that they owned or shared a digital device at home were also found by students' sex, race/ethnicity, disability status, eligibility for free or reduced-price lunch, and school locale. Similar to the pattern observed at grade 4, a higher percentage of 8th-grade female students (99 percent) reported owning or sharing a digital device at home than their male peers (98 percent). Higher percentages of Asian and White students (99 percent each) than of Hispanic students (98 percent) reported owning or sharing a digital device at home. In addition, the percentage of Asian students was higher than the percentage of students of Two or more races (95 percent).

Consistent with patterns at grade 4, the percentage of 8th-grade students who reported owning or sharing a digital device was higher for students without a disability (99 percent) than for students with a disability (96 percent), and was higher for students not eligible for free or reduced-price lunch (99 percent) than for students eligible for free or reduced-price lunch (98 percent). With respect to school locale, a higher percentage of 8th-grade students in rural schools (99 percent) than in city schools (98 percent) reported owning or sharing a device at home.

Figure 13.3. Percentage of 12th-grade public school students who reported that they owned or shared a digital device at home, by selected student and school characteristics: 2015



‡ Reporting standards not met (too few cases for a reliable estimate).
NOTE: Digital devices include desktop computers, laptop computers, tablets, and smartphones. Race categories exclude persons of Hispanic ethnicity.
SOURCE: American Institutes for Research, National Assessment of Educational Progress (NAEP) Validity Studies Panel, *Initial Tables From the 2015 Computer Access and Familiarity Study*. See *Digest of Education Statistics 2016*, table 218.40.

At grade 12, few measurable differences were found by student and school characteristics. Higher percentages of White students and students of Two or more races (99 percent each) than of Black students (97 percent) reported owning or sharing a digital device at home. In addition, a higher percentage of students not eligible for free or reduced-price lunch (99 percent) than students eligible for free or reduced-price lunch (97 percent) reported owning or sharing a digital device at home.

Reference tables: Table 13.1.

Indicator 14

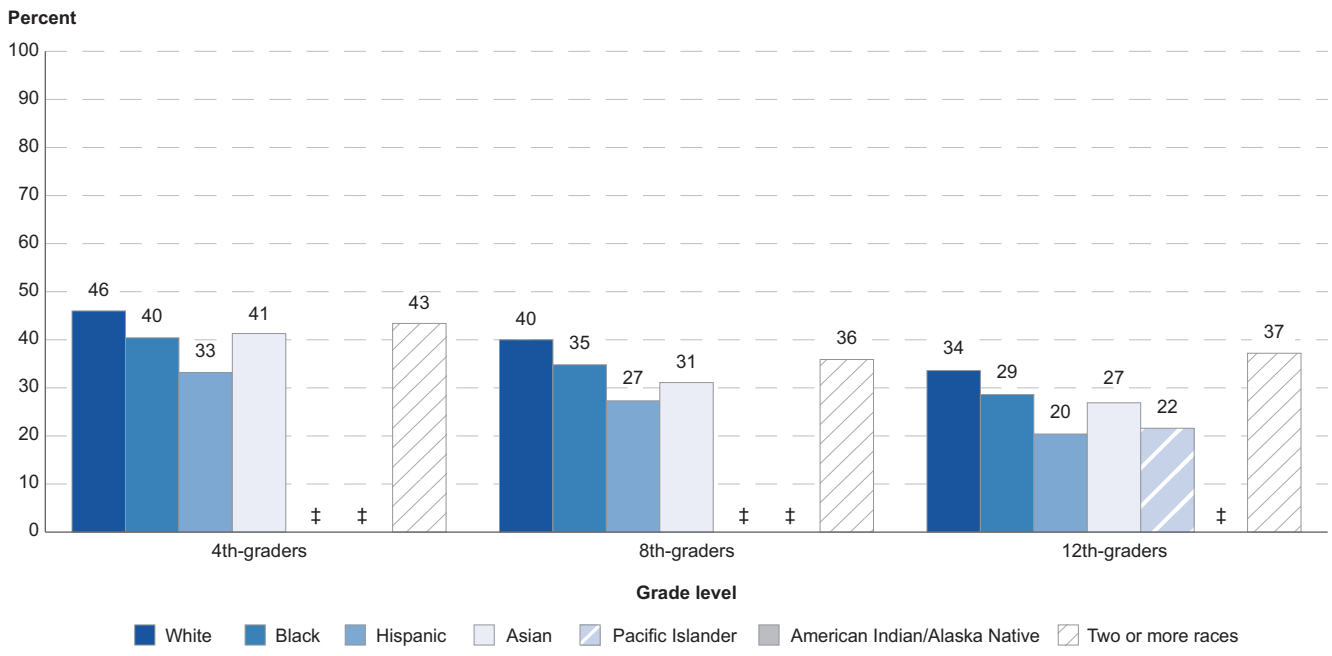
First Use of Computer

In 2015, about 41 percent of 4th-grade public school students reported first using a laptop or desktop computer in kindergarten or before kindergarten. This was higher than the percentages of 8th-grade (35 percent) and 12th-grade (29 percent) public school students in 2015 who reported first using a laptop or desktop computer in kindergarten or before kindergarten.

The Computer Access and Familiarity Study (CAFS) was designed to measure student access to and familiarity with technology. The CAFS was conducted as part of the 2015 National Assessment of Educational Progress (NAEP) and administered to public school students in grades 4, 8, and 12.

This indicator uses the CAFS to examine when 4th-, 8th-, and 12th-grade public school students reported first using a laptop or desktop computer anywhere, by selected student or school characteristics. In 2015, about 41 percent of 4th-grade public school students reported first using a laptop or desktop computer in kindergarten or before kindergarten. This was higher than the percentages of 8th-grade (35 percent) and 12th-grade (29 percent) public school students in 2015 who reported first using a laptop or desktop computer in kindergarten or before kindergarten. In addition, 4 percent of 4th-grade public school students reported never having used a laptop or desktop computer before. This was higher than the percentages of 8th- and 12th-grade public school students (1 percent each) who reported never having used a laptop or desktop computer.

Figure 14.1. Percentage of public school students who first used a laptop or desktop computer in or before kindergarten, by grade level and race/ethnicity: 2015



‡ Reporting standards not met. Either there are too few cases for a reliable estimate or the coefficient of variation (CV) is 50 percent or greater.
NOTE: Race categories exclude persons of Hispanic ethnicity.
SOURCE: American Institutes for Research, National Assessment of Educational Progress (NAEP) Validity Studies Panel, *Initial Tables From the 2015 Computer Access and Familiarity Study*. See *Digest of Education Statistics 2016*, table 218.45.

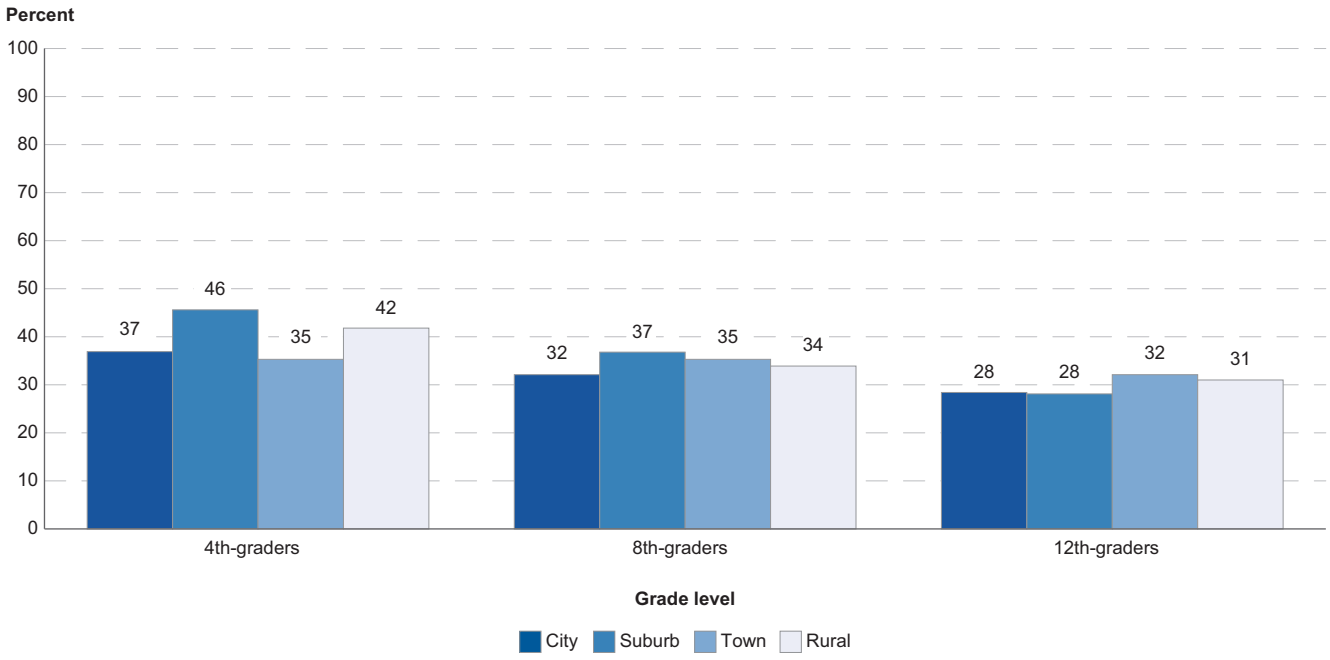
Among 4th-grade public school students in 2015 who reported first using a computer in kindergarten or before, differences were found by student sex, race/ethnicity, English language learner (ELL) status, disability status, eligibility for free or reduced-price lunch (FRPL), and school locale. A higher percentage of 4th-grade females (43 percent) than males (39 percent) reported first using a computer in kindergarten or before. The percentage of 4th-grade students who reported first using a computer in kindergarten or earlier was higher for White students (46 percent) than for Black (40 percent) and Hispanic students (33 percent). In addition, the percentages of students of Two or more races (43 percent), Asian students (41 percent), and Black students who reported first using a computer in kindergarten or earlier were higher than the percentage for Hispanic students. The percentage of 4th-grade students who reported first using a computer in kindergarten or before was higher for non-ELL students (42 percent) than for ELL students (31 percent), and was also higher for students without a disability (42 percent) than for students with a disability (36 percent).

A higher percentage of 4th-grade students not eligible for FRPL (48 percent) than of those who were eligible for FRPL (37 percent) reported first using a computer in kindergarten or earlier. With respect to school locale, higher percentages of 4th-grade students in suburban (46 percent) and rural schools (42 percent) than in city (37 percent) and town schools (35 percent) reported first using a computer in kindergarten or earlier.

Among 4th-grade students in 2015 who reported never having used a computer, differences were found by student sex, race/ethnicity, ELL status, disability status, eligibility for FRPL, and school locale. A higher percentage of 4th-grade males (5 percent) than females (4 percent) reported never having used a computer. The percentage of 4th-grade students who reported never having used a computer was higher for Black and Hispanic students (6 percent each) than for White students (3 percent). The percentage of 4th-grade students who reported never having used a computer was higher for ELL students (10 percent) than for non-ELL students (4 percent), and was also higher for students with a disability (8 percent) than for students without a disability (4 percent).

A lower percentage of 4th-grade students not eligible for FRPL (2 percent) than of those who were eligible for FRPL (6 percent) reported never having used a computer. In addition, a lower percentage of 4th-grade students in suburban schools (4 percent) than in city schools (5 percent) reported never having used a computer.

Figure 14.2. Percentage of public school students who first used a laptop or desktop computer in or before kindergarten, by grade level and locale: 2015



NOTE: Race categories exclude persons of Hispanic ethnicity.
SOURCE: American Institutes for Research, National Assessment of Educational Progress (NAEP) Validity Studies Panel, *Initial Tables From the 2015 Computer Access and Familiarity Study*. See *Digest of Education Statistics 2016*, table 218.45.

Among 8th-grade public school students in 2015 who reported first using a computer in kindergarten or before, differences were found by student sex, race/ethnicity, ELL status, disability status, eligibility for FRPL, and school locale. Similar to the pattern observed at grade 4, a higher percentage of 8th-grade females (37 percent) than males (33 percent) reported first using a computer in kindergarten or earlier. A higher percentage of White students (40 percent) than of Black (35 percent), Asian (31 percent), and Hispanic students (27 percent) reported first using a computer in kindergarten or earlier. In addition, the percentages for students of Two or more races (36 percent) and Black students were higher than the percentage for Hispanic students. Consistent with patterns at grade 4, the percentage of 8th-grade students who reported first using a computer in kindergarten or before was higher for non-ELL students (36 percent) than for ELL students (18 percent). The percentage of 8th-grade students who reported first using a computer in kindergarten or before was higher for students without a disability (35 percent) than for students with a disability (29 percent), and was also higher for students not eligible for FRPL (41 percent) than for students who were eligible for FRPL (31 percent). With respect to school locale, a higher percentage of 8th-grade students in suburban schools (37 percent) than in city schools (32 percent) reported first using a computer in kindergarten or earlier.

Among 12th-grade public school students in 2015 who reported first using a computer in kindergarten or before, differences were found by student race/ethnicity, ELL status, and eligibility for FRPL. A higher percentage of White students (34 percent) than of Black (29 percent), Asian (27 percent), Pacific Islander (22 percent), and Hispanic students (20 percent) reported first using a computer in kindergarten or earlier. In addition, the percentages for students of Two or more races (37 percent), Black, and Asian students were higher than the percentage for Hispanic students. Consistent with patterns at grades 4 and 8, the percentage of 12th-grade students who reported first using a computer in kindergarten or before was higher for non-ELL students (30 percent) than for ELL students (12 percent) and higher for students not eligible for FRPL (34 percent) than for students who were eligible for FRPL (22 percent). However, unlike the patterns observed at grades 4 and 8, the percentages of 12th-grade students who reported using a computer for the first time in kindergarten or before did not differ measurably by sex, disability status, or school locale.

Reference tables: Table 14.1.

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Section 3: Challenges Faced by Students Who Lack Access to Digital Learning Resources Outside of the Classroom

As discussed in the previous section, some students may not have home access to digital learning resources (DLR) for various reasons, including financial constraints, a lack of internet service in the area where they live, and concerns about online privacy, cybersecurity, and personal safety. These barriers to DLR may hamper students' ability to fully participate and engage in school. In contrast to the extensive body of research literature on the use of technology in classrooms (Donovan, Green, and Hartley 2010; Mouza 2008; Kent and Moore 2014; Rosen and Beck-Hill 2012; Eseryel et al. 2014; Larkin 2011), research on the relationship between students' access to DLR at home and their participation and engagement in the classroom has been more limited. This section begins with a summary of prior research on the relationship between students' home access to DLR and homework completion. Next, eight indicators present analyses of the most recently available nationally and internationally representative survey data that explore associations between DLR access at home and academic achievement for students with different individual and family characteristics.

Homework Completion

DeBell and Chapman (2006) used data from the 2003 Current Population Survey to analyze student habits with computers and the Internet inside and outside of the classroom. The authors found that the majority of students in sixth grade and above used computers and the Internet to complete their homework, with the percentage increasing as students advanced in their educational careers. The transition from traditional, paper-based homework assignments to online homework offers both advantages and disadvantages (Dodson 2014; Katz, Lee, and Byrne 2015). Shifting to an online homework approach may enable teachers to keep curriculum and materials current and relevant to classroom discussions, increase students' efficiency in submitting assignments and teachers' efficiency in providing feedback, and reduce the cost of paper materials. On the other hand, students may lack easy access to the Internet outside of school, experience problems with the software or platforms used for online homework, and be distracted by multitasking; there may also be a greater potential for academic dishonesty.

Gui, Micheli, and Fiore (2014) used reading literacy data for Italy from the 2009 Program for International Student Assessment (PISA) to investigate whether students' academic performance was related to their home internet use and socioeconomic background. They found that moderate users of the Internet—those who used it at home for schoolwork once or twice a month to once or twice a week—had higher scores than those who used the Internet more than twice a week (frequently) and those who used the Internet less than once a month (infrequently). This pattern was observed for students from all socioeconomic backgrounds. Another study of 435 eighth-graders from five randomly chosen schools in Istanbul, Turkey, found that students enjoyed using computers and Internet tools for homework, and they developed a positive attitude toward doing homework on the computer and the Internet (Ongun, Altas, and Demirag 2011).

While the focus of this report is on children between the ages of 3 to 18, research on the online homework experiences of postsecondary students may nevertheless be relevant. Doorn, Janssen, and O'Brien (2010) surveyed college students in 14 sections of seven economics courses on their attitudes and practices related to online homework. Over 90 percent of the students who were surveyed reported

that online homework was beneficial to understanding the material and preparing for exams. Students liked the flexibility and immediate feedback associated with online homework, and they found it at least as easy to do homework online as it was using traditional means. The study found that students' previous experience with online systems, year in school, gender, and learning style had little relationship with their attitudes toward online homework, which indicated that its perceived benefits were not limited to a particular group.

Associations Between Home Access to DLR and Academic Achievement

There is less research on relationships between students' access to DLR at home and their participation and engagement in the classroom than on other topics more narrowly focused on classroom activities. However, some studies explored relationships between student computer access at home and academic outcomes, with mixed findings. While some studies of home computer access revealed positive correlations with academic performance (Jackson et al. 2006; Beltran, Das, and Fairlie, 2010; Espinosa et al. 2006; Fish et al. 2008), others found no relationship or negative relationships between home computer access and student achievement (Fairlie and Robinson 2013; Hunley et al. 2005; Vigdor, Ladd, and Martinez 2014). In addition, research on the impact of instructional computer use in schools on academic performance, including some randomized control trials and several quasi-experimental studies, found mixed results (Campuzano et al. 2009; Dynarski et al. 2007; Goolsbee and Guryan 2006; Shannon et al. 2015; Suhr et al. 2010; Chambers et al. 2011).

The eight indicators in this section describe differences in academic achievement associated with home computer use and internet access for students with different individual and family characteristics. The results from the indicator analyses of national and international data sources consistently showed higher average achievement scores for students who used computers at home and/or had internet access at home than for those who did not. This pattern was observed for students' reading, mathematics, and science performance (*Indicators 15, 16, 17, 19, 20,* and *21*) and for students' knowledge of information and communication technology (*Indicator 18*). However, the size of the achievement gaps between those who reported using a computer at home/having access to the Internet at home and those who did not varied by student and family characteristics. For an international reference point, *Indicator 22* shows that a higher percentage of U.S. 16- to 19-year-olds performed at the lowest proficiency level in problem solving in technology-rich environments than the Organization for Economic Cooperation and Development (OECD) average.

The indicators in this section present bivariate statistics from a variety of sources to compare students' computer use and internet access at home and their academic achievement. One of the limitations of bivariate statistics is that they describe subpopulation differences without taking into account the influence of other individual, family, school, and environmental factors. Many of the academic achievement variables examined in this report may be related to other factors outside of students' access to and use of computers and the Internet in their homes. For example, achievement gaps between those who reported using a computer at home/having access to the Internet at home and those who did not could be influenced by other factors, including socioeconomic background characteristics such as parents' educational attainment and family income. Associations between socioeconomic characteristics and DLR access are presented in Section 1 of this report. The design of these surveys combined with the lack of comprehensive socioeconomic metrics limits their use on this topic to primarily descriptive indicators. Future research using more complex methods, such as multivariate analyses, can further explore relationships between student home computer/internet use and academic outcomes after taking into account other characteristics of students, families, and schools that are also related to academic performance.

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Indicator 15

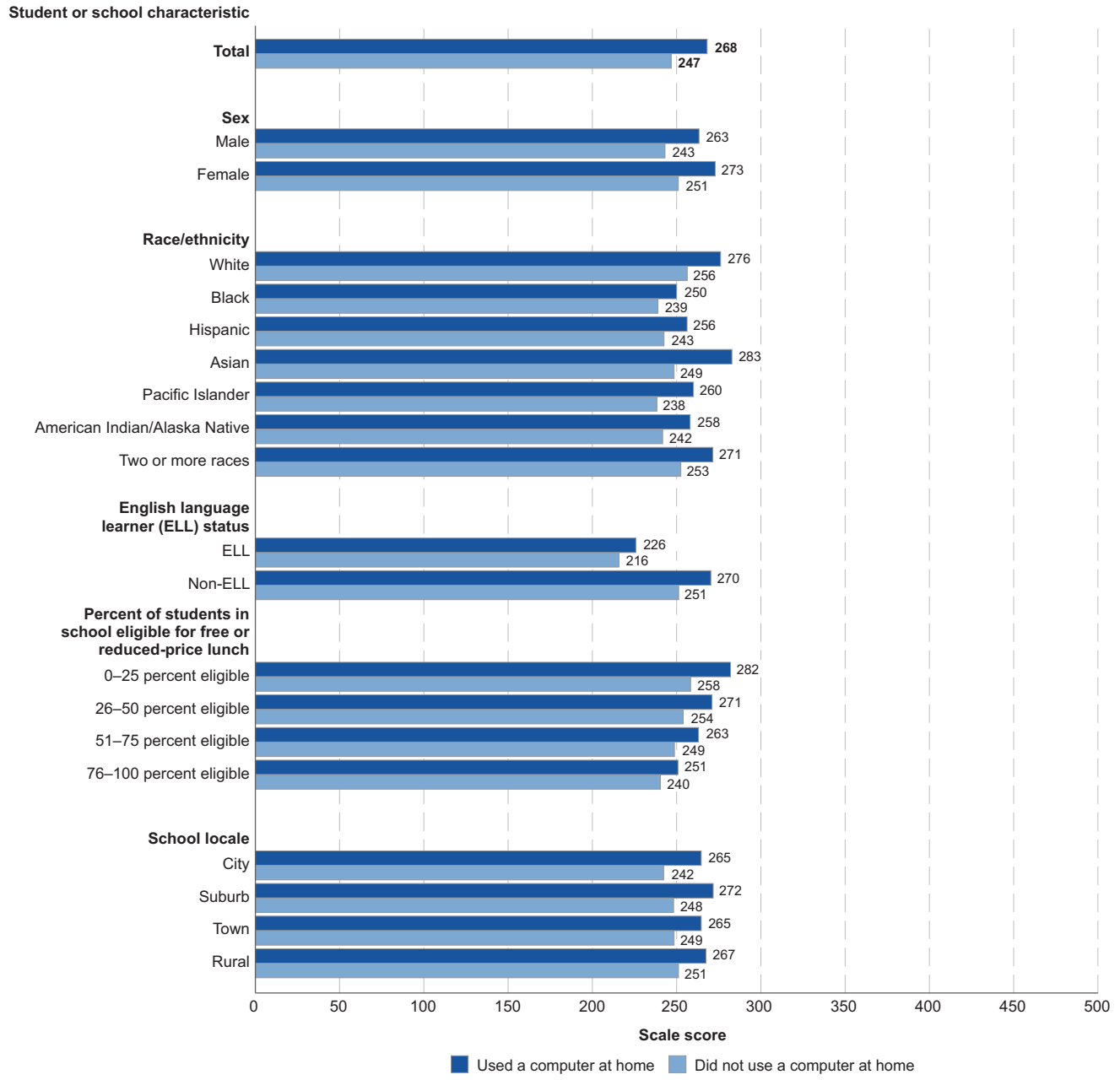
Reading Scores by Computer Use and Internet Access at Home

In 2015, the average NAEP reading scale score was higher for 8th-grade students who used a computer at home (268) than for those who did not use a computer at home (247). Similarly, the average reading scale score was higher for 8th-grade students who had access to the Internet at home (267) than for those who did not have access to the Internet at home (242).

Using data collected in the National Assessment of Educational Progress (NAEP) reading administration, this indicator describes associations between students' computer use and internet access at home and their reading assessment scores. Achievement gaps between those who reported using a computer at home/having access to the Internet at home and those who did not could be influenced by other factors, including socioeconomic background characteristics such as parents' educational attainment and family income.[1] NAEP assesses student performance in reading at grades 4, 8, and 12 in both public and private schools across the nation.[2] NAEP reading assessments have been administered periodically since 1992, with the most recent assessments occurring in 2015. The 2015 NAEP reading assessment was administered in a paper-and-pencil format. In addition to administering the reading assessment, NAEP includes a student questionnaire to provide context for student performance. The NAEP student questionnaire includes questions on demographics, as well as questions about students' use of computers and access to the Internet at home.

In 2015, average reading scale scores varied according to whether students reported that they used a computer at home and whether they had access to the Internet at home. Differences were observed at both grades, as well as across various student and school characteristics, including sex, racial/ethnic group, English language learner (ELL) status, school poverty status,[3] and school locale. The NAEP reading scores range from 0 to 500 for all grade levels.[4]

Figure 15.1. Average National Assessment of Educational Progress (NAEP) reading scale scores of 8th-graders, by selected student and school characteristics and computer use at home: 2015

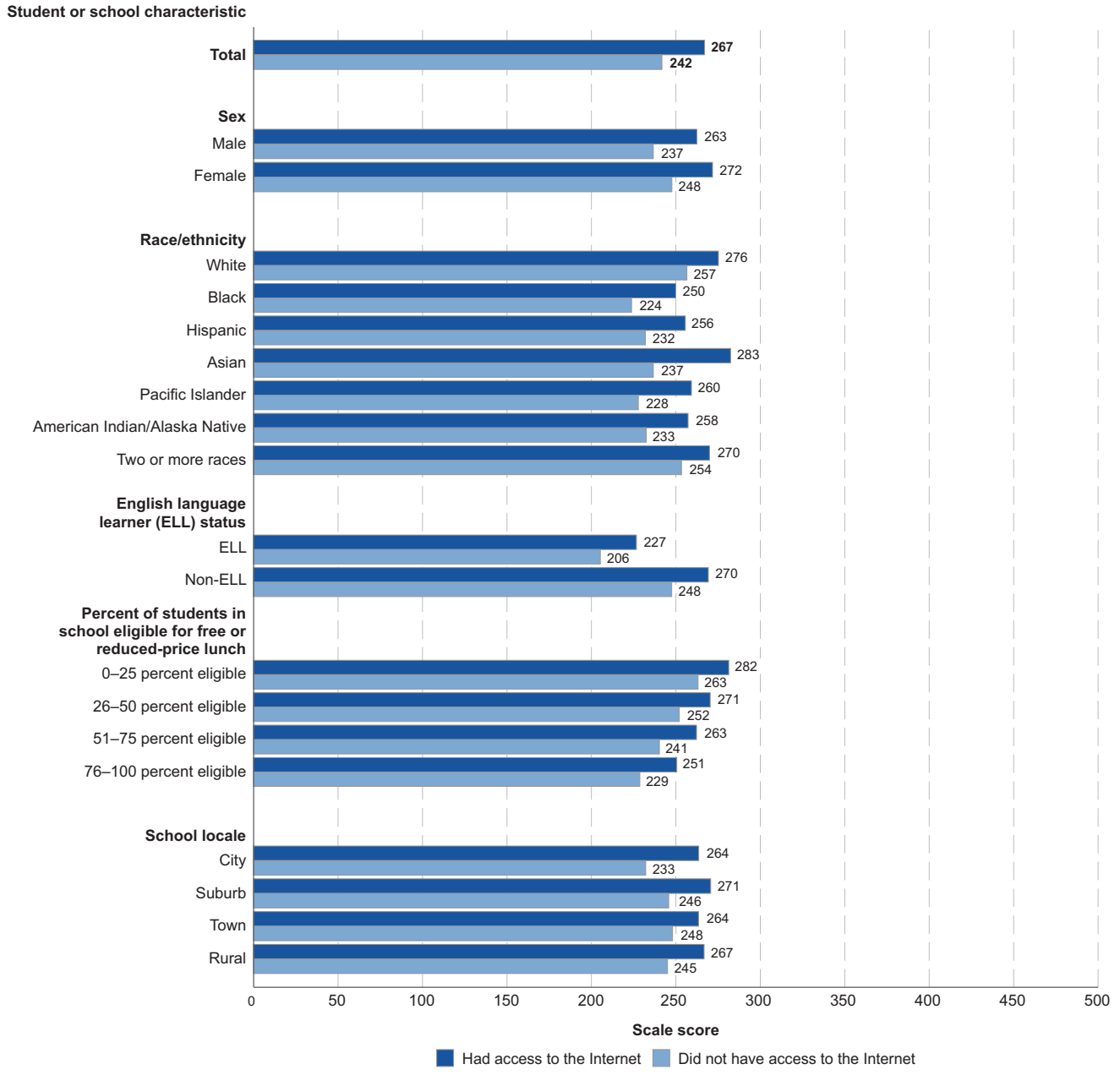


NOTE: Scale ranges from 0 to 500. Includes students tested in reading with accommodations (11 percent of all 8th-graders); excludes only those students with disabilities and English language learners who were unable to be tested even with accommodations (2 percent of all 8th-graders). Race categories exclude persons of Hispanic ethnicity.
SOURCE: U.S. Department of Education, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2015 Reading Assessment, NAEP Data Explorer. See *Digest of Education Statistics 2016*, table 221.35.

On the 2015 reading assessment, students who used a computer at home scored higher than those who did not use a computer at home. The average 8th-grade reading scale score was 268 for students who used a computer at home, compared to 247 for those who did not use a computer at home. The average 4th-grade reading scale score was 225 for students who used a computer at home, compared to 209 for those who did not use a computer at home. This pattern was consistently observed across student and school characteristics. For example, the average 8th-grade reading scale scores for students who used a computer at home and for those who did not were 270 vs. 251 for non-ELL students, and 226 vs. 216 for ELL students. Similarly, the average 8th-grade reading scale scores for students who used a computer at home and for those who did not were 282 vs. 258 for students in low-poverty schools, and 251 vs. 240 for students in high-poverty schools.

Although students who used a computer at home consistently scored higher on the 2015 reading assessment than those who did not use a computer at home, the size of differences in reading scale scores between those who reported using a computer at home and those who did not varied by racial/ethnic groups, ELL status, and school poverty status. For example, the reading score difference between 8th-grade students who used a computer at home and those who did not was larger for White students (20 points), than for Hispanic students (14 points) and Black students (11 points). The score difference was also larger for non-ELL 8th-grade students than for ELL 8th-grade students (19 points vs. 10 points), and larger for those in low-poverty schools than for those in high-poverty schools (24 points vs. 10 points). In addition, score differences varied by school locale: the differences were 23 points and 22 points for students in suburban and city schools, respectively, compared to 16 points each for those in town and rural schools. Most of these differences in reading scores associated with whether students used a computer at home were also observed at grade 4. One exception was that the difference in reading assessment scores between 4th-grade students who used a computer at home and those who did not use a computer at home did not measurably differ by school poverty status. In addition, the reading score difference between 4th-grade students who used a computer at home and those who did not was not measurably different between White students and Hispanic students.

Figure 15.2. Average National Assessment of Educational Progress (NAEP) reading scale scores of 8th-graders, by selected student and school characteristics and internet access at home: 2015



NOTE: "Access to the Internet" was one item on a list preceded by the question "Do you have the following in your home?" For each item, students could either select "Yes" or leave the item blank. Students who left "Access to the Internet" blank are counted as having no internet access at home. Scale ranges from 0 to 500. Includes students tested in reading with accommodations (11 percent of all 8th-graders); excludes only those students with disabilities and English language learners who were unable to be tested even with accommodations (2 percent of all 8th-graders). Race categories exclude persons of Hispanic ethnicity.
SOURCE: U.S. Department of Education, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2015 Reading Assessment, NAEP Data Explorer. See *Digest of Education Statistics 2016*, table 221.35.

At both grade 4 and grade 8, average 2015 reading scale scores were higher for students who reported that they had access to the Internet at home than for those who did not. The average reading score was 267 for 8th-grade students who had access to the Internet at home, compared to 242 for those who did not have access. At grade 4, the average reading score was 227 for students who had access to the Internet at home, compared to 200 for those who did not have access. This pattern was consistently observed across student and school characteristics. For example, the average 8th-grade reading scale scores for students who had access to the Internet at home and those who did not were 263 vs. 237 for male students, and 272 vs. 248 for female students. Similarly, the average 8th-grade reading scale scores for students who had access to the Internet at home and for those who did not were 264 vs. 233 for students in city schools, 271 vs. 246 for students in suburban schools, 264 vs. 248 for students in town schools, and 267 vs. 245 for students in rural schools.

The size of differences in reading scale scores between those who had access to the Internet at home and those who did not varied by student and school characteristics. For example, the 2015 score difference for 8th-grade students was smaller for White students (19 points) than for Hispanic students (24 points) and Black students (26 points). By locale, the score difference was largest for 8th-grade students in city schools (31 points), followed by those in suburban (25 points) and rural schools (22 points), and smallest for those in town schools (15 points). The 8th-grade score differences associated with home internet access were not measurably different by sex, ELL status, and school poverty status.

Endnotes:

[1] Associations between socioeconomic characteristics and DLR access are presented in Section 1 of this report.

[2] The results for grade 8 students are shown in the figures. The results for grade 4 students are available in reference tables cited at the end of the indicator.

[3] In this indicator, low-poverty schools are those with 0–25 percent of students eligible for free or reduced-price lunch, and high-poverty schools are those with 76–100 percent of students eligible for free or reduced-price lunch. For more discussions on using free or reduced-price lunch data as a proxy for poverty, see the NCES blog "Free or reduced price lunch: A proxy for poverty?" (http://nces.ed.gov/blogs/nces/post/free-or-reduced-price-lunch-a-proxy-for-poverty).

[4] While the scale is cross-grade, the skills tested and the material on the test increase in complexity and difficulty at each higher grade level, so different things are measured at the different grades even though a progression is implied.

Reference tables: Table 5.1.

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Indicator 16

Mathematics Scores by Computer Use and Internet Access at Home

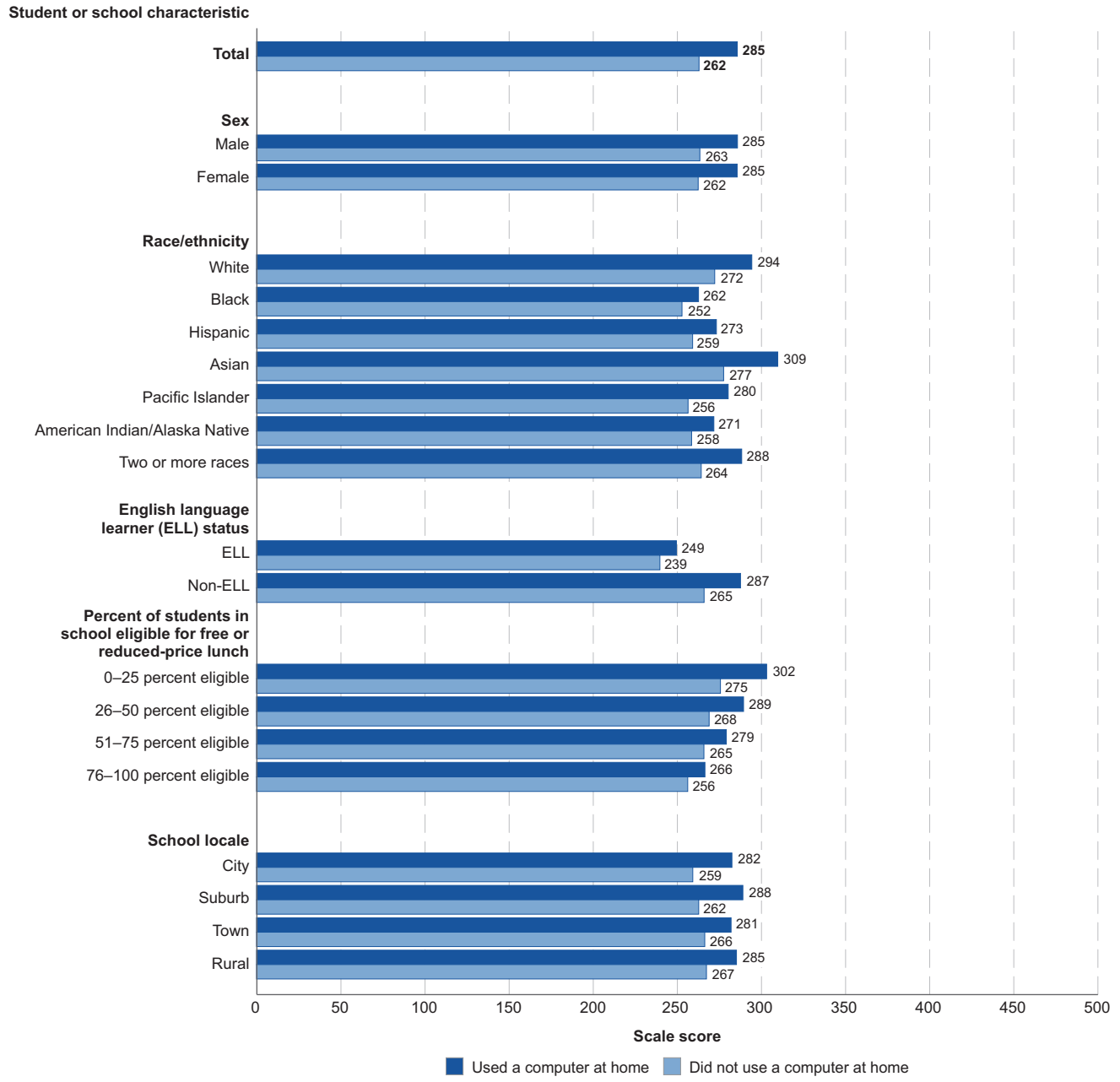
In 2015, the average 8th-grade NAEP mathematics scale score was higher for 8th-grade students who used a computer at home (285) than for those who did not use a computer at home (262). Similarly, the average mathematics scale score was higher for 8th-grade students who had access to the Internet at home (284) than for those who did not have access to the Internet at home (261).

Using data collected from the National Assessment of Educational Progress (NAEP) mathematics administration, this indicator describes associations between students' computer use and internet access at home and their mathematics assessment scores. Achievement gaps between those who reported using a computer at home/having access to the Internet at home and those who did not could be influenced by other factors, including socioeconomic background characteristics such as parents' educational attainment and family income.[1] NAEP assesses student performance in mathematics at grades 4, 8, and 12 in both public and private schools across the nation.[2] NAEP mathematics assessments have been administered periodically since 1992; the most recent were administered in 2015. The 2015 NAEP mathematics assessment was administered in a paper-and-pencil format. In addition to the assessment, NAEP includes a student questionnaire to provide context for student performance. The NAEP student questionnaire includes questions on demographics, as well as questions about students' use of computers and access to the Internet at home.

In 2015, average mathematics scale scores varied according to whether students reported that they used a computer at home and whether they had access to the Internet at home. Differences were observed at grades 4 and 8, as well as across various student and school characteristics, including sex, racial/ethnic group, English language learner (ELL) status, school poverty status,[3] and school locale. NAEP mathematics scores range from 0 to 500 for both grade levels.[4]

On the 2015 mathematics assessment, students who used a computer at home scored higher than those who did not use a computer at home. The average 8th-grade mathematics scale score was 285 for students who used a computer at home, compared with 262 for those who did not use a computer at home. The average 4th-grade mathematics scale score was 243 for students who used a computer at home, compared with 230 for those who did not use a computer at home. This pattern was consistently observed across student and school characteristics. For example, the average 8th-grade mathematics scale scores for students who used a computer at home and for those who did not were 287 vs. 265 for non-ELL students, and 249 vs. 239 for ELL students. Similarly, the average 8th-grade mathematics scale scores for students who used a computer at home and for those who did not were 302 vs. 275 for students in low-poverty schools and 266 vs. 256 for students in high-poverty schools.

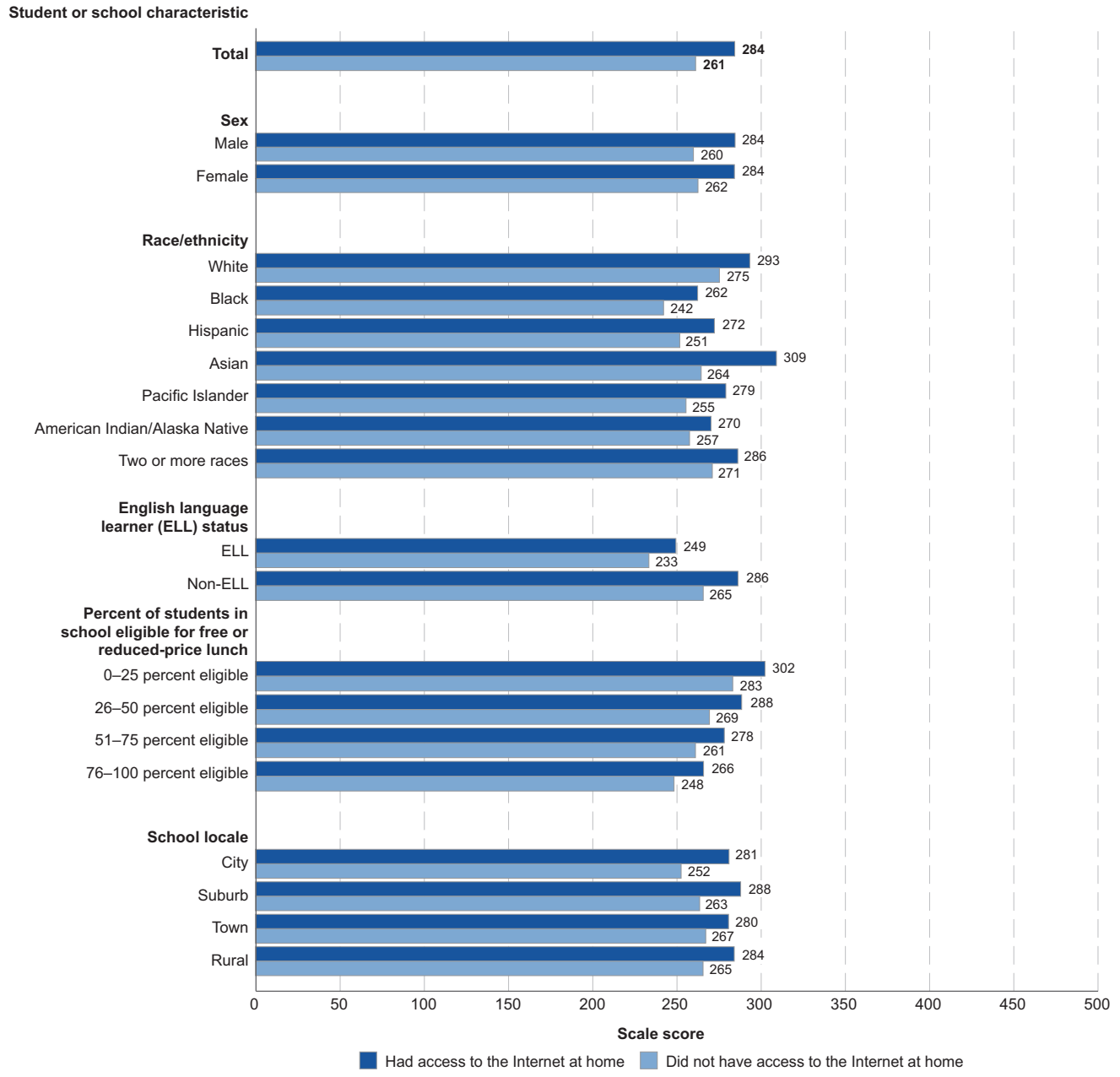
Figure 16.1. Average National Assessment of Educational Progress (NAEP) mathematics scale scores of 8th-graders, by selected student and school characteristics and computer use at home: 2015



NOTE: Scale ranges from 0 to 500. Includes students tested in mathematics with accommodations (12 percent of all 8th-graders); excludes only those students with disabilities and English language learners who were unable to be tested even with accommodations (2 percent of all 8th-graders). Race categories exclude persons of Hispanic ethnicity.
SOURCE: U.S. Department of Education, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2015 Mathematics Assessment, NAEP Data Explorer. See *Digest of Education Statistics 2016*, table 222.45.

Although students who used a computer at home consistently scored higher on the 2015 mathematics assessment than those who did not use a computer at home, the size of differences between those who reported using a computer at home and those who did not varied by racial/ethnic group, ELL status, and school poverty status. For example, the mathematics score difference between 8th-grade students who used a computer at home and those who did not was larger for White students (22 points) than for Hispanic students (14 points) and Black students (10 points). The score difference was also larger for non-ELL 8th-graders than for ELL 8th-graders (22 points vs. 10 points), and larger for those in low-poverty schools than for those in high-poverty schools (27 points vs. 10 points). Similar patterns in mathematics score differences relating to home computer use by racial/ethnic group, ELL status, and school poverty status were observed at grade 4. Differences in mathematics scores associated with whether students used a computer at home differed by school locale: Among 8th-grade students, the mathematics score difference was largest for students in suburban schools (26 points), followed by those in city schools (23 points), and smallest for those in rural (18 points) and town schools (16 points). However, the 4th-grade mathematics score differences relating to home computer use were not measurably different between 4th-grade students in suburban schools (15 points) and their counterparts in city schools (13 points). The score difference between 4th-grade students who had a computer at home and those who did not was higher among students in suburban (15 points) and city (13 points) schools than among students in rural and town schools (9 points each).

Figure 16.2. Average National Assessment of Educational Progress (NAEP) mathematics scale scores of 8th-graders, by selected student and school characteristics and internet access at home: 2015



NOTE: "Access to the Internet" was one item on a list preceded by the question "Do you have the following in your home?" For each item, students could either select "Yes" or leave the item blank. Students who left the "access to the Internet" item blank are counted as having no internet access at home. Scale ranges from 0 to 500. Includes students tested in mathematics with accommodations (12 percent of all 8th-graders); excludes only those students with disabilities and English language learners who were unable to be tested even with accommodations (2 percent of all 8th-graders). Race categories exclude persons of Hispanic ethnicity.
SOURCE: U.S. Department of Education, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2015 Mathematics Assessment, NAEP Data Explorer. See *Digest of Education Statistics 2016*, table 222.45.

At both grade 4 and grade 8, average 2015 mathematics scale scores were higher for students who reported that they had access to the Internet at home than for those who did not. Specifically, the average mathematics score was 284 for 8th-grade students who had access to the Internet at home, compared with 261 for those who did not have access. The average 4th-grade mathematics scale score was 244 for students who had access to the Internet at home, compared with 222 for those who did not have access to the Internet at home. This pattern was consistently observed across student and school characteristics. For example, the average 8th-grade mathematics scale scores for students who had access to the Internet at home and those who did not were 284 vs. 260 for male students, and 284 vs. 262 for female students. Similarly, the average 8th-grade mathematics scale scores for students who had access to the Internet at home and for those who did not were 281 vs. 252 for students in city schools, 288 vs. 263 for students in suburban schools, 280 vs. 267 for students in town schools, and 284 vs. 265 for students in rural schools.

The size of differences in mathematics scale scores between those who had access to the Internet at home and those who did not varied by student and school characteristics. For example, among 8th-grade students the mathematics score difference associated with whether students had home internet access was higher for male students (25 points) than for female students (22 points); and the score difference was higher for non-ELL students (21 points) than for ELL students (16 points). In addition, this score difference was largest for 8th-graders in city schools (28 points), followed by the difference for those in suburban schools (24 points) and rural schools (19 points), and smallest for those in town schools (14 points). However, mathematics score differences between those who had access to the Internet at home and those who did not were not measurably different among White, Black, and Hispanic 8th-graders. In addition, differences in mathematics scores for 8th-graders associated with home internet access were not measurably different by school poverty status. At grade 4, the mathematics score difference between those who had access to the Internet at home and those who did not was larger for non-ELL 4th-graders (20 points) than for ELL 4th-graders (15 points), and larger for 4th-graders in low-poverty schools (19 points) than for those in high-poverty schools (16 points). In addition, this score difference was larger for 4th-graders in city schools and suburban schools (24 points each) than for those in town (17 points) and rural schools (16 points). However, the score differences between those who had access to the Internet at home and those who did not were not measurably different between male and female students or between White, Black, and Hispanic students.

Endnotes:

[1] Associations between socioeconomic characteristics and DLR access are presented in Section 1 of this report.

[2] The results for grade 8 students are shown in the figures. The results for grade 4 students are available in reference tables cited at the end of the indicator.

[3] In this indicator, low-poverty schools are those with 0–25 percent of students eligible for free or reduced-price lunch, and high-poverty schools are those with 76–100 percent of students eligible for free or reduced-price lunch. For more discussions on using free or reduced-price lunch data as a proxy for poverty, see the NCES blog "Free or reduced-price lunch: A proxy for poverty?" (http://nces.ed.gov/blogs/nces/post/free-or-reduced-price-lunch-a-proxy-for-poverty).

[4] While the scale is cross-grade, the skills tested and the material on the test increase in complexity and difficulty at each higher grade level, so different things are measured at the different grades even though a progression is implied.

Reference tables: Table 16.1.

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Indicator 17

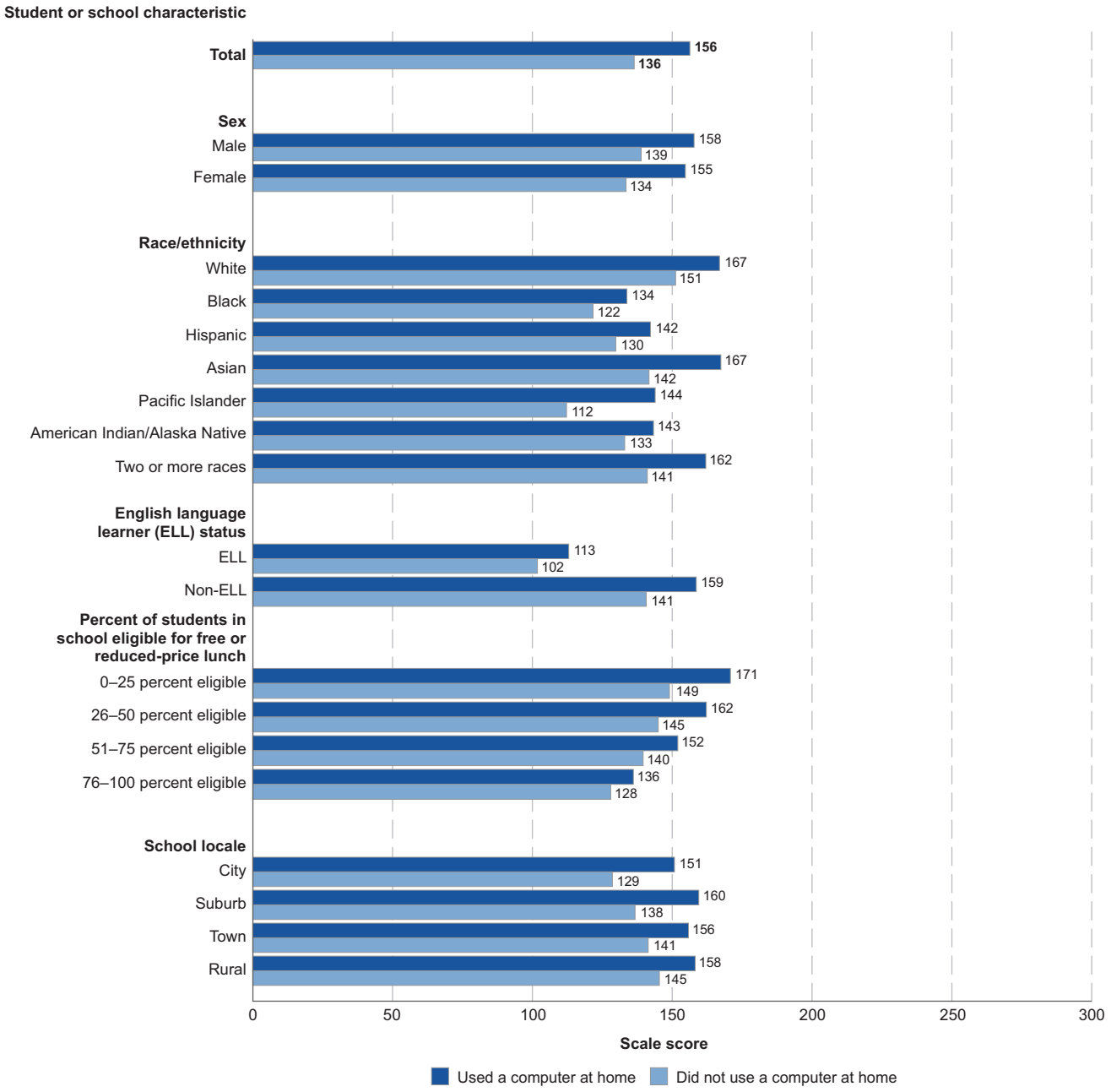
Science Scores by Computer Use and Internet Access at Home

In 2015, the average NAEP science scale score was higher for 8th-grade students who used a computer at home (156) than for those who did not use a computer at home (136). Similarly, the average science scale score was higher for 8th-grade students who had access to the Internet at home (156) than for those who did not have access to the Internet at home (135).

Using data from the National Assessment of Educational Progress (NAEP) science administration, this indicator describes associations between students' computer use and internet access at home and their science assessment scores. Achievement gaps between those who reported using a computer at home/having access to the Internet at home and those who did not could be influenced by other factors, including socioeconomic background characteristics such as parents' educational attainment and family income.[1] NAEP assesses student performance in science at grades 4, 8, and 12 in both public and private schools across the nation.[2] NAEP science assessments have been administered periodically since 1990; the most recent were administered in 2015. The 2015 NAEP science assessment was administered in a paper-and-pencil format. In addition to the assessment, NAEP includes a questionnaire to provide context for student performance. The NAEP science questionnaire includes questions on demographics, as well as questions about students' use of computers and access to the Internet at home.

In 2015, average science scale scores varied by whether students reported that they used a computer at home and whether they had access to the Internet at home. Differences were observed at both grades 4 and 8 and across various student and school characteristics, including sex, racial/ethnic group, ELL status, school poverty status,[3] and school locale. The NAEP science score range is from 0 to 300 for both grade levels.[4]

Figure 17.1. Average National Assessment of Educational Progress (NAEP) science scale scores of 8th-graders, by selected student and school characteristics and computer use at home: 2015

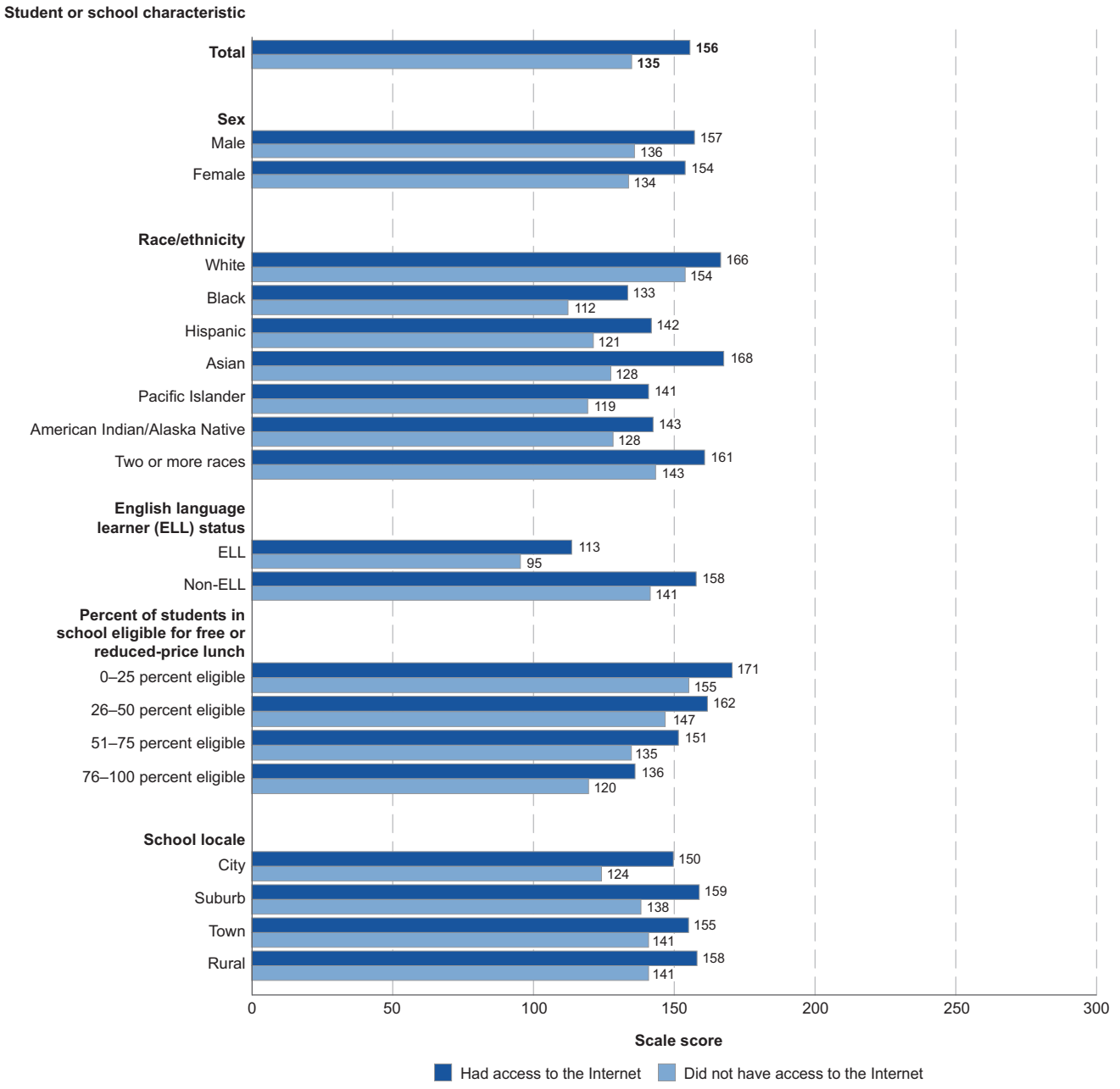


NOTE: Scale ranges from 0 to 300. Includes students tested in science with accommodations (10 percent of all 8th-graders); excludes only those students with disabilities and English language learners who were unable to be tested even with accommodations (1 percent of all 8th-graders). Race categories exclude persons of Hispanic ethnicity.
SOURCE: U.S. Department of Education, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2015 Science Assessment, NAEP Data Explorer. See *Digest of Education Statistics 2016*, table 223.40.

On the 2015 science assessment, students who used a computer at home scored higher than those who did not use a computer at home. The average 8th-grade science scale score was 156 for students who used a computer at home, compared to 136 for those who did not use a computer at home. The average 4th-grade science scale score was 156 for students who used a computer at home, compared with 141 for those who did not use a computer at home. This pattern was consistently observed across student and school characteristics. For example, the average 8th-grade science scale scores for students who used a computer at home and for those who did not were 159 vs. 141 for non-ELL students, and 113 vs. 102 for ELL students. Similarly, the average 8th-grade science scale scores for students who used a computer at home and for those who did not were 171 vs. 149 for students in low-poverty schools and 136 vs. 128 for students in high-poverty schools.

Although students who used a computer at home consistently scored higher on the 2015 science assessment than those who did not use a computer at home, the differences in the average science scale scores between those who reported using a computer at home and those who did not varied by racial/ethnic group, ELL status, and school poverty status in 2015. For example, the score difference between 8th-grade students who used a computer at home and those who did not was larger for White students (16 points) than for Hispanic and Black students (12 points each). The score difference was also larger for non-ELL students than for ELL students (18 points vs. 11 points), and larger for students in low-poverty schools than for students in high-poverty schools (22 points vs. 8 points). In addition, the score difference varied by school locale: the score differences were 23 points and 22 points, respectively, for students in suburban and city schools, compared to 14 points for those in town schools and 13 points in rural schools. Most of these variations in score difference observed at grade 8 were also observed at grade 4. One exception was that the measurable differences observed among White and Hispanic students at grade 8 were not also observed at grade 4. The score difference associated with home computer use was not measurably different between males and females at either grade level.

Figure 17.2. Average National Assessment of Educational Progress (NAEP) science scale scores of 8th-graders, by selected student and school characteristics and internet access at home: 2015



NOTE: "Access to the Internet" was one item on a list preceded by the question "Do you have the following in your home?" For each item, students could either select "Yes" or leave the item blank. Students who left the "access to the Internet" item blank are counted as having no internet access at home. Scale ranges from 0 to 300. Includes students tested in science with accommodations (10 percent of all 8th-graders); excludes only those students with disabilities and English language learners who were unable to be tested even with accommodations (1 percent of all 8th-graders). Race categories exclude persons of Hispanic ethnicity.
SOURCE: U.S. Department of Education, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2015 Science Assessment, NAEP Data Explorer. See *Digest of Education Statistics 2016*, table 223.40.

Average 2015 science scale scores were higher for students who reported that they had access to the Internet at home than for those who did not at both grade 4 and grade 8. The average science score was 156 for 8th-grade students who had access to the Internet at home, compared to 135 for those who did not have access. At grade 4, the average science score was 158 for students who had access to the Internet at home, compared to 133 for those who did not have access. This pattern was consistently observed across student and school characteristics. For example, the average 8th-grade science scale scores for students who had access to the Internet at home and those who did not were 157 vs. 136 for male students and 154 vs. 134 for female students. Similarly, the average 8th-grade science scale scores for students who had access to the Internet at home and for those who did not were 150 vs. 124 for students in city schools, 159 vs. 138 for students in suburban schools, 155 vs. 141 for students in town schools, and 158 vs. 141 for students in rural schools.

The differences in science scale scores between those who had access to the Internet at home and those who did not varied by student and school characteristics. For example, the 2015 score difference between White 8th-grade students with access to the Internet at home and those without access (13 points) was smaller than the differences for Black and Hispanic 8th-grade students (21 points each). By school locale, the score difference was largest for 8th-grade students in city schools (26 percent), and larger for those in suburban schools (21 points) than for those in town schools (14 points). The 8th-grade score difference was not measurably different by sex, ELL status, or school poverty status. Some of the differences observed at grade 8 were not observed at grade 4. For instance, the science score difference associated with home internet access was not measurably different between White and Black 4th-grade students. Also, at grade 4 the science score difference was larger for students in city (29 points) and suburban schools (27 points) than for students in town (18 points) and rural schools (20 points). In addition, the science score difference was larger for non-ELL than ELL 4th-grade students (23 points vs. 18 points).

Endnotes:

[1] Associations between socioeconomic characteristics and DLR access are presented in Section 1 of this report.
[2] The results for grade 8 students are shown in the figures. The results for grade 4 students are available in reference tables cited at the end of the indicator.
[3] In this indicator, low-poverty schools are those with 0–25 percent of students eligible for free or reduced-price lunch, and high-poverty schools are those with 76–100 percent of students eligible for free or reduced-price lunch. For more discussions on using free or reduced-price lunch data as a proxy for poverty, see the NCES blog "Free or reduced price lunch: A proxy for poverty?" (http://nces.ed.gov/blogs/nces/post/free-or-reduced-price-lunch-a-proxy-for-poverty).
[4] Although the score ranges are identical, the scales were derived independently at each grade; therefore, scales cannot be compared across grades.

Reference tables: Table 17.1.

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Indicator 18

Information and Communication Technology Scores by Computer Use and Internet Access at Home

In 2014, the average 8th-grade score in the information and communication technology content area was higher for students who used a computer at home (152) than for those who did not use a computer at home (128). Similarly, the average ICT score was higher for 8th-grade students who had access to the Internet at home (152) than for those who did not have access to the Internet at home (124).

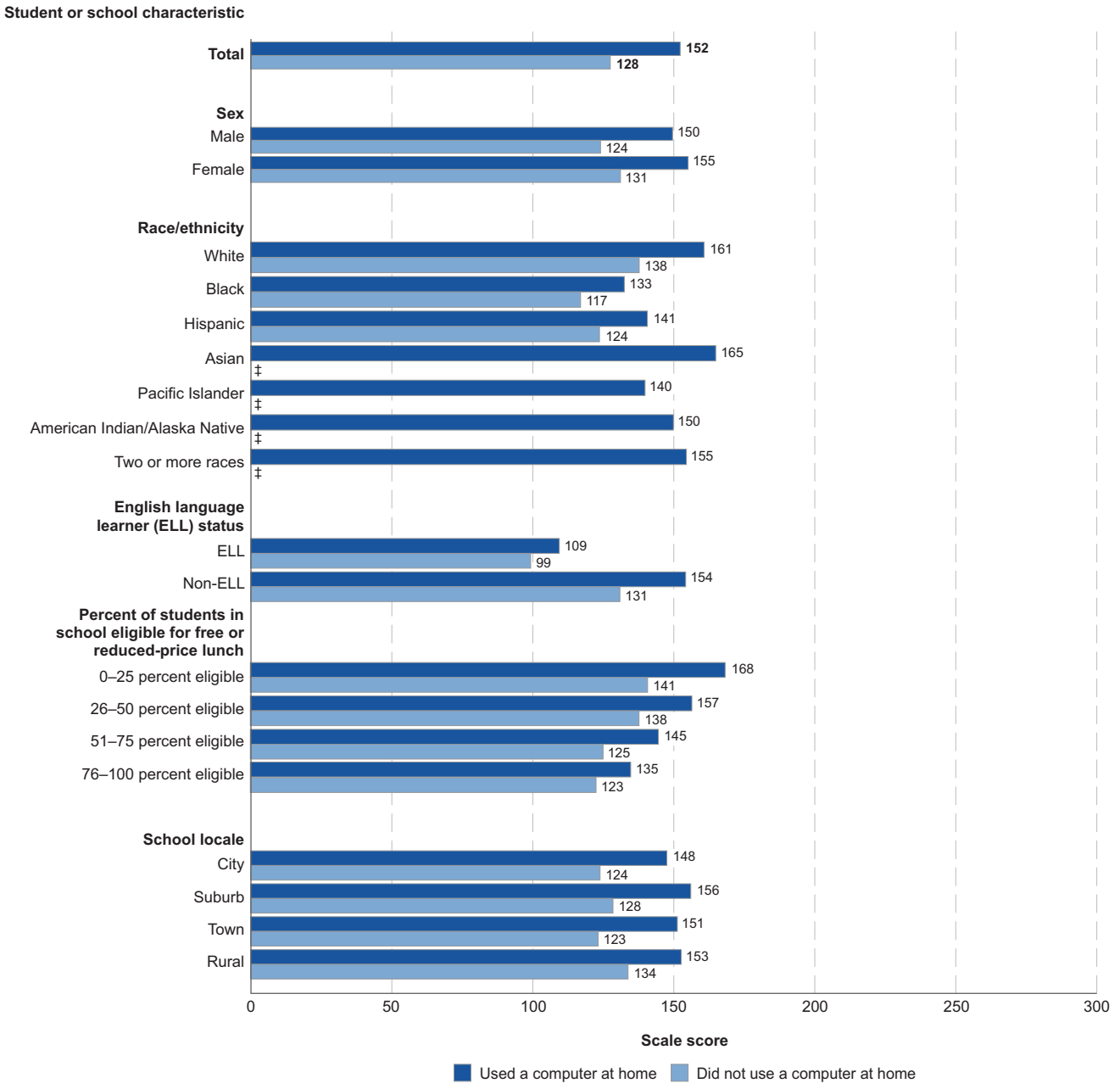
The National Assessment of Educational Progress (NAEP) Technology and Engineering Literacy (TEL) assessment measures whether students are able to apply technology and engineering skills to real-life situations. In the framework, technology is defined as "any modification of the natural world done to fulfill human needs or desires," and engineering is defined as "a systematic and often iterative approach to designing objects, processes, and systems to meet human needs and wants."

The TEL assessment is designed to measure three interconnected areas of technology and engineering literacy: technology and society, design and systems, and information and communication technology. Information and communication technology (ICT)[1] includes computers and software learning tools, networking systems and protocols, hand-held digital devices, and other technologies for accessing, creating, and communicating information and for facilitating creative expression. Information and communication technologies are integrated into every sphere of contemporary life, and has profound implications for how people learn in school, solve practical problems, and function in the workplace. This indicator focuses on the content area of ICT to describe the associations between student achievement in ICT and computer use and internet access at home.

The TEL assessment was administered on a computer in 2014 for grade 8 in both public and private schools across the nation. In addition to the assessment, TEL also includes a student questionnaire to provide a context for student performance. The TEL student questionnaire includes questions on demographics, as well as TEL-specific questions about students' experiences with technology. In 2014, more than 90 percent of 8th-graders reported they used a computer at home (91 percent) and they had access to the Internet at home (94 percent).

In 2014, average TEL ICT scale scores varied by whether students reported that they used a computer at home and whether they had access to the Internet at home. Differences were observed across various student and school characteristics, including sex, racial/ethnic group, ELL status, school poverty status,[2] and school locale. The TEL ICT scores range from 0 to 300.

Figure 18.1. Average scale score of 8th-graders on the information and communication technology (ICT) content area of the National Assessment of Educational Progress (NAEP) Technology and Engineering Literacy (TEL) Assessment, by selected student and school characteristics and computer use at home: 2014

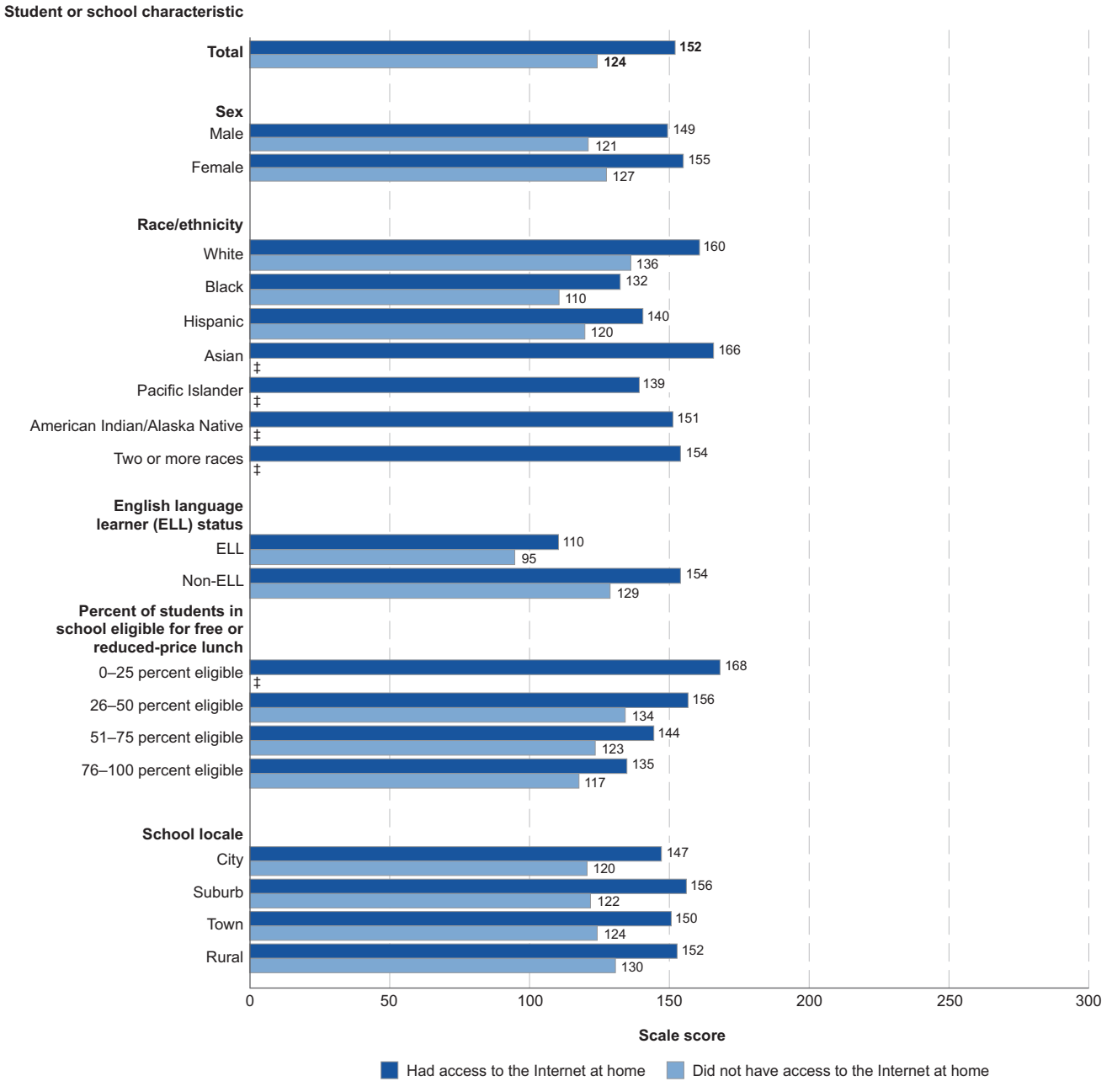


‡ Reporting standards not met. Either there are too few cases for a reliable estimate or the coefficient of variation (CV) is 50 percent or greater.
NOTE: Scale ranges from 0 to 300. Information and communication technology (ICT) is one of three content areas on the TEL assessment. ICT includes computers and software learning tools, networking systems and protocols, hand-held digital devices, and other technologies for accessing, creating, and communicating information and for facilitating creative expression. Includes students tested with accommodations (10 percent of all 8th-graders); excludes only those students with disabilities and English language learners who were unable to be tested even with accommodations (1 percent of all 8th-graders). Race categories exclude persons of Hispanic ethnicity.
SOURCE: U.S. Department of Education, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2014 Technology and Engineering Literacy (TEL) Assessment, NAEP Data Explorer. See *Digest of Education Statistics 2016*, table 224.73.

The average ICT scale score was higher for students who used a computer at home (152) than for those who did not use a computer at home (128). This pattern was consistently observed across various student and school characteristics, including sex, racial/ethnic group, English language learner (ELL) status, school poverty status, and school locale. For example, the average 8th-grade ICT scale scores for students who used a computer at home and those who did not were 154 vs. 131 for non-ELL students, and 109 vs. 99 for ELL students. Similarly, the average 8th-grade ICT scale scores for students who used a computer at home and those who did not were 168 vs. 141 for students in low-poverty schools, and 135 vs. 123 for students in high-poverty schools.

Although students who used a computer at home consistently scored higher on the 2014 TEL ICT scale than those who did not use a computer at home, the differences in TEL ICT scale scores between those who reported using a computer at home and those who did not varied by racial/ethnic group, ELL status, school poverty status, and school locale. For example, the ICT score difference between those who used a computer at home and those who did not was 23 points for White students, compared to 17 points for Hispanic students and 15 points for Black students. The score difference was 23 points for non-ELL students, compared to 10 points for ELL students. The score difference was 27 points for students in low-poverty schools, compared to 12 points for those in high-poverty schools; and the difference was 28 points each for students in suburban and town schools, compared to 19 points for those in rural schools.

Figure 18.2. Average scale score of 8th-graders on the information and communication technology (ICT) content area of the National Assessment of Educational Progress (NAEP) Technology and Engineering Literacy (TEL) Assessment, by selected student and school characteristics and internet access at home: 2014



‡ Reporting standards not met. Either there are too few cases for a reliable estimate or the coefficient of variation (CV) is 50 percent or greater.
NOTE: "Access to the Internet" was one item on a list preceded by the question "Do you have the following in your home?" For each item, students could either select "Yes" or leave the item blank. Students who left "Access to the Internet" blank are counted as having no internet access at home. Scale ranges from 0 to 300. ICT includes computers and software learning tools, networking systems and protocols, hand-held digital devices, and other technologies for accessing, creating, and communicating information and for facilitating creative expression. Includes students tested with accommodations (10 percent of all 8th-graders); excludes only those students with disabilities and English language learners who were unable to be tested even with accommodations (1 percent of all 8th-graders). Race categories exclude persons of Hispanic ethnicity.
SOURCE: U.S. Department of Education, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2014 Technology and Engineering Literacy (TEL) Assessment, NAEP Data Explorer. See *Digest of Education Statistics 2016*, table 224.73.

Similarly, the average 2014 ICT score was higher for students who had access to the Internet at home (152) than for those who did not have access to the Internet at home (124). This pattern was consistently observed across various student and school characteristics, including sex, racial/ethnic group, ELL status, school poverty status, and school locale. For example, the average 8th-grade ICT scale scores for students who had access to the Internet at home and those who did not were 160 vs. 136 for White students, 132 vs. 110 for Black students, and 140 vs. 120 for Hispanic students. Similarly, the average 8th-grade ICT scale scores for students who had access to the Internet at home and for those who did not were 147 vs. 120 for students in city schools, 156 vs. 122 for students in suburban schools, 150 vs. 124 for students in town schools, and 152 vs. 130 for students in rural schools.

Across student and school characteristics, ICT scale scores for those who had internet access at home did not measurably differ from scores for those who did not, in general. The characteristics of ELL status and school locale were exceptions, however. There was a score difference of 25 points for non-ELL students, compared to a difference of 16 points for ELL students. As for school locale, the score difference was 34 points for students in suburban schools, compared to 26 points for those in city schools and 22 points for those in rural schools.

Endnotes:

[1] For details on the Technology and Engineering Literacy (TEL) assessment or the information and communication technology (ICT) content area, please refer to https://nces.ed.gov/nationsreportcard/tel/.

[2] In this indicator, low-poverty schools are those with 0–25 percent of students eligible for free or reduced-price lunch, and high-poverty schools are those with 76–100 percent of students eligible for free or reduced-price lunch. For more discussions on using free or reduced-price lunch data as a proxy for poverty, see the NCES blog "Free or reduced price lunch: A proxy for poverty?" (http://nces.ed.gov/blogs/nces/post/free-or-reduced-price-lunch-a-proxy-for-poverty).

Reference tables: Table 18.1.

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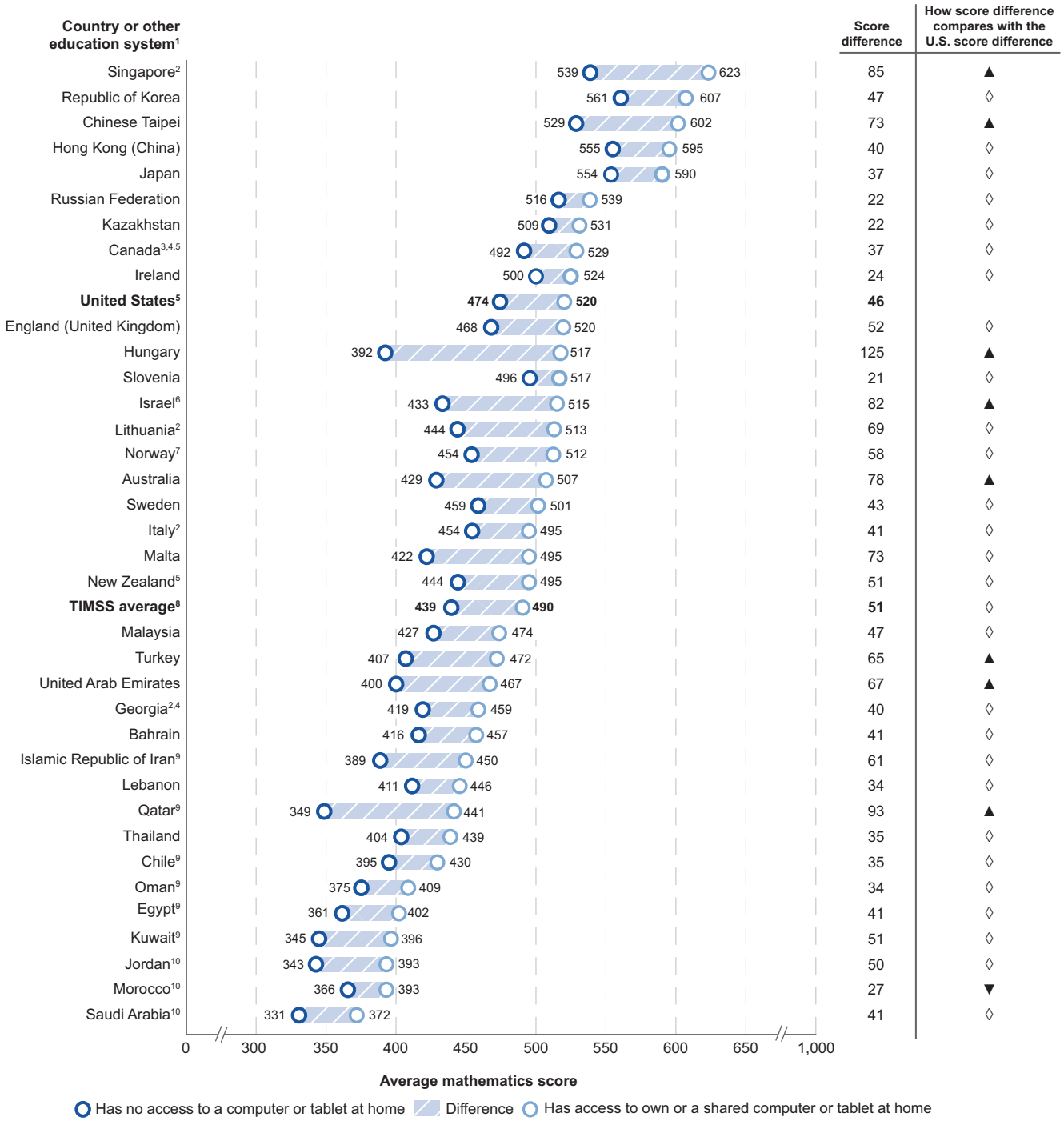
Indicator 19

International Comparisons of Mathematics Scores by Student Computer Use and Internet Access at Home and at School

In 34 out of 37 assessed countries and other education systems in 2015, eighth-graders who had access to their own or a shared computer at home had higher TIMSS mathematics scores than those who did not have access to a computer at home. In the United States, eighth-graders who had access to a computer at home had an average mathematics score of 520, compared with an average score of 474 for eighth-graders who did not.

This indicator uses data from the mathematics assessment of the 2015 Trends in International Mathematics and Science Study (TIMSS 2015) to examine differences between the performance of eighth-graders who had access to computers (including tablets) and the Internet at home and at school and the performance of those who did not. Achievement gaps between those who reported using a computer at home/having access to the Internet at home and those who did not could be influenced by other factors, including socioeconomic background characteristics such as parents' educational attainment and family income.[1] In 2015, the eighth-grade TIMSS assessment was administered in 38 participating countries and other educational systems.[2] Thirty-seven of these countries and other education systems are included in this analysis.[3] The TIMSS 2015 assessment was administered in a paper-and-pencil format, but countries could elect to administer the school, teacher, and/or home questionnaires online. TIMSS 2015 results are reported on a scale from 0 to 1,000, with the scale center point set at 500 and the standard deviation set at 100.

Figure 19.1. Average mathematics scores of eighth-graders, by country or other education system and whether they have access to their own or a shared computer or tablet at home: 2015



See notes on next page.

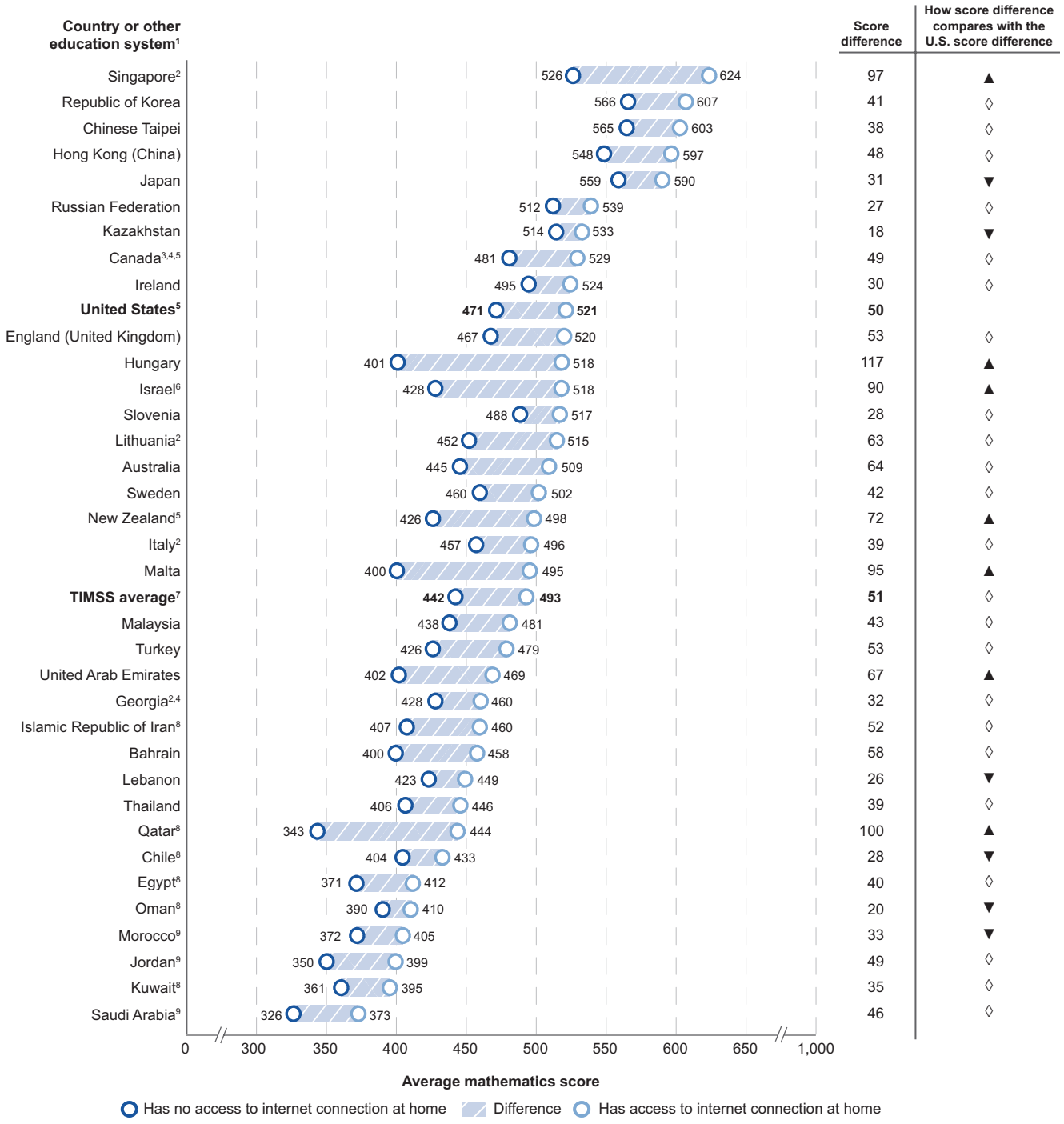
▲ The size of the difference in mathematics scores between those who did and did not have access to a computer at home is greater than in the United States.
▼ The size of the difference in mathematics scores between those who did and did not have access to a computer at home is smaller than in the United States.
◊ The size of the difference in mathematics scores between those who did and did not have access to a computer at home is not measurably different from the corresponding difference in the United States.
[1] Most of the education systems represent complete countries, but some represent subnational entities.
[2] National Defined Population covers 90 to 95 percent of National Target Population as defined by TIMSS.
[3] Data for Canada include only students from the provinces of Alberta, Manitoba, Newfoundland, Ontario, and Quebec.
[4] National Target Population does not include all of the International Target Population as defined by TIMSS.
[5] Met guidelines for sample participation rates only after replacement schools were included.
[6] National Defined Population covers less than 90 percent of the National Target Population (but at least 77 percent) as defined by TIMSS.
[7] Norway collected data from students in their ninth year of schooling rather than in grade 8 because year 1 in Norway is considered the equivalent of kindergarten rather than the first year of primary school.
[8] The international average includes only education systems that are members of the International Association for the Evaluation of Educational Achievement (IEA), which develops and implements TIMSS at the international level.
[9] The TIMSS & PIRLS International Study Center has reservations about the reliability of the average achievement score because the percentage of students with achievement too low for estimation exceeds 15 percent, though it is less than 25 percent.
[10] The TIMSS & PIRLS International Study Center has reservations about the reliability of the average achievement score because the percentage of students with achievement too low for estimation exceeds 25 percent.
NOTE: Trends in International Mathematics and Science Study (TIMSS) scores are reported on a scale from 0 to 1,000, with the scale centerpoint set at 500 and the standard deviation set at 100. Countries and other education systems were required to draw probability samples of students who were nearing the end of their eighth year of formal schooling (counting the first year of primary school as year 1), provided that the mean age at the time of testing was at least 13.5 years.
SOURCE: International Association for the Evaluation of Educational Achievement (IEA), Trends in International Mathematics and Science Study (TIMSS), 2015. See *Digest of Education Statistics 2016*, table 602.32a.

On the TIMSS 2015 mathematics assessment, eighth-graders in the United States who had access to their own or a shared computer or tablet at home scored higher than those who did not have access at home. The average eighth-grade mathematics score was 520 for eighth-graders who had access to a computer at home, compared with 474 for those who did not. As a comparison, in Canada the average eighth-grade mathematics score was 529 for eighth-graders who had access to a computer at home, compared with 492 for those who did not. The TIMSS average mathematics score was also higher for eighth-graders who had access to a computer at home (490) than for those who did not (439). This same pattern was observed for nearly all countries that participated in TIMSS 2015. The exceptions were the Russian Federation, Kazakhstan, and Slovenia; in these three countries, the average mathematics scores of eighth-graders who had access to a computer at home were not measurably different from those of eighth-graders who did not have access at home.

Although eighth-graders who had access to their own or a shared computer or tablet at home scored higher on the TIMSS 2015 mathematics assessment than those who did not in nearly all participating countries, the size of the difference in mathematics scores between those who did and did not have access to a computer at home varied by country. The mathematics score difference between those who did and did not have access to a computer at home ranged from no measurable difference in the Russian Federation, Kazakhstan, and Slovenia to 125 points in Hungary. In the United States, the difference in the average mathematics score between eighth-graders who did have access to a computer at home and those who did not was 46 points—a difference that was not measurably different than the TIMSS average difference (51 points). However, the mathematics score difference between those who did and did not have access to a computer at home was greater than the difference in the United States in eight countries (Hungary, Qatar, Singapore, Israel, Australia, Chinese Taipei, the United Arab Emirates, and Turkey). Conversely, one country (Morocco) had a score difference (27 points) that was smaller than the corresponding score difference in the United States. The remaining 27 countries had mathematics score differences that were not measurably different from the score difference in the United States.

The same patterns were not observed across countries with regard to students' access to computers during mathematics lessons at school. In 27 countries, including the United States, there were no measurable differences in the average mathematics scores of eighth-graders who had access to computers during mathematics lessons at school and those who did not. In three countries (Malta, Qatar, and Ireland), eighth-graders who did not have access to computers during mathematics lessons had higher average mathematics scores than eighth-graders who did. Conversely, eighth-graders who did have access to computers during mathematics lessons at school scored higher than those who did not in seven countries: Saudi Arabia, Israel, the Islamic Republic of Iran, the United Arab Emirates, Morocco, Turkey, and Jordan.

Figure 19.2. Average mathematics scores of eighth-graders, by country or other education system and whether they have access to the Internet at home: 2015



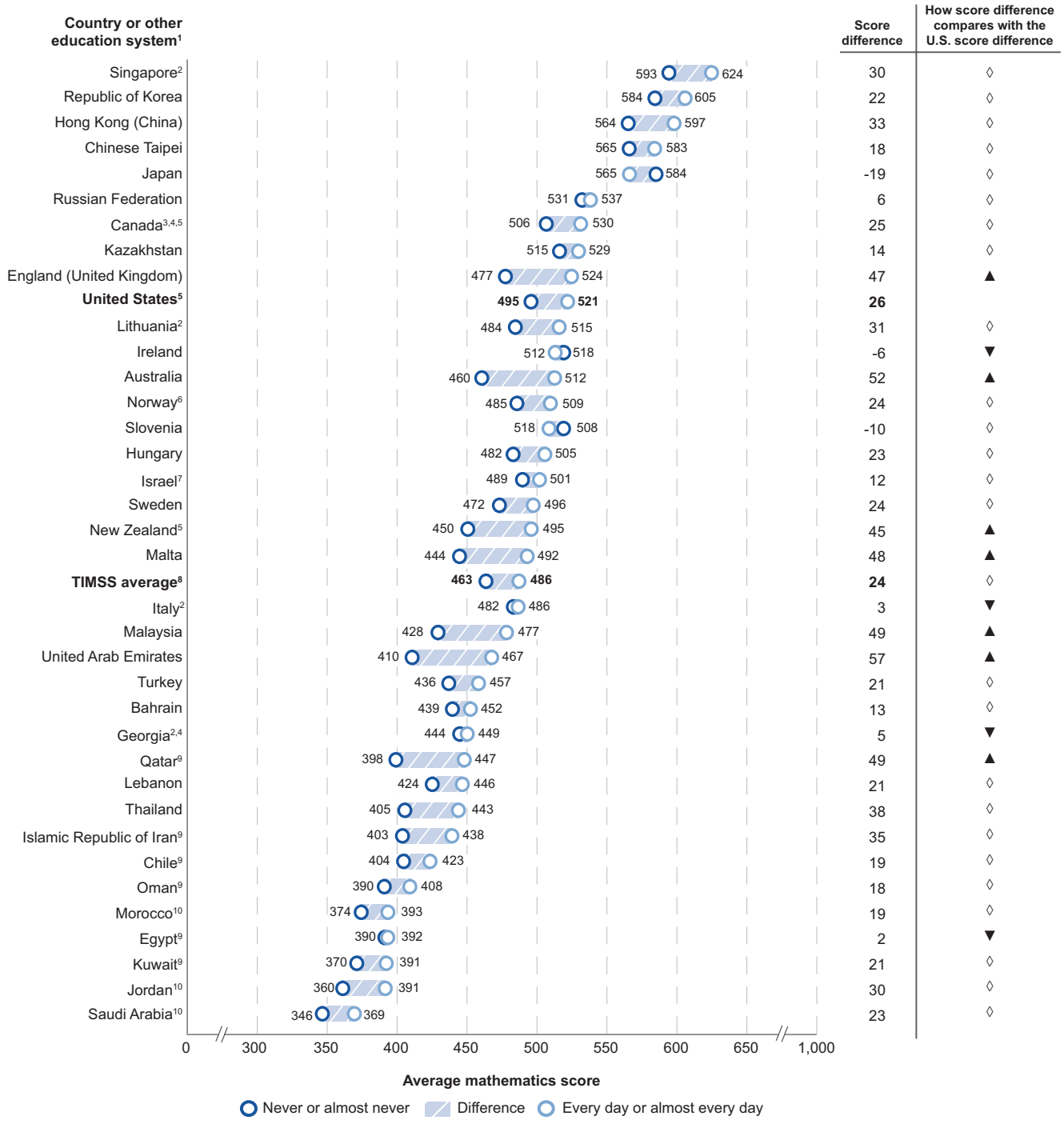
See notes on next page.

▲ The size of the difference in mathematics scores between those who did and did not have access to the Internet at home is greater than in the United States.
▼ The size of the difference in mathematics scores between those who did and did not have access to the Internet at home is smaller than in the United States.
◊ The size of the difference in mathematics scores between those who did and did not have access to the Internet at home is not measurably different from the corresponding difference in the United States.
[1] Most of the education systems represent complete countries, but some represent subnational entities.
[2] National Defined Population covers 90 to 95 percent of National Target Population as defined by TIMSS.
[3] Data for Canada include only students from the provinces of Alberta, Manitoba, Newfoundland, Ontario, and Quebec.
[4] National Target Population does not include all of the International Target Population as defined by TIMSS.
[5] Met guidelines for sample participation rates only after replacement schools were included.
[6] National Defined Population covers less than 90 percent of the National Target Population (but at least 77 percent) as defined by TIMSS.
[7] The international average includes only education systems that are members of the International Association for the Evaluation of Educational Achievement (IEA), which develops and implements TIMSS at the international level.
[8] The TIMSS & PIRLS International Study Center has reservations about the reliability of the average achievement score because the percentage of students with achievement too low for estimation exceeds 15 percent, though it is less than 25 percent.
[9] The TIMSS & PIRLS International Study Center has reservations about the reliability of the average achievement score because the percentage of students with achievement too low for estimation exceeds 25 percent.
NOTE: Trends in International Mathematics and Science Study (TIMSS) scores are reported on a scale from 0 to 1,000, with the scale centerpoint set at 500 and the standard deviation set at 100. Countries and other education systems were required to draw probability samples of students who were nearing the end of their eighth year of formal schooling (counting the first year of primary school as year 1), provided that the mean age at the time of testing was at least 13.5 years.
SOURCE: International Association for the Evaluation of Educational Achievement (IEA), Trends in International Mathematics and Science Study (TIMSS), 2015. See *Digest of Education Statistics 2016*, table 602.32a.

On the TIMSS 2015 mathematics assessment, eighth-graders in the United States who had access to the Internet at home scored higher than those who did not have access at home. The average eighth-grade mathematics score was 521 for eighth-graders who had access to the Internet at home, compared with 471 for those who did not. As a comparison, in England, the average eighth-grade mathematics score was 520 for eighth-graders who had access to the Internet at home, compared with 467 for those who did not. The TIMSS average mathematics score was also higher for eighth-graders who had access to the Internet at home (493) than for those who did not (442). This same pattern was observed for nearly all participating countries. The exceptions were Slovenia and Kazakhstan; in these two countries, the average mathematics scores of eighth-graders who had access to the Internet at home were not measurably different from those of eighth-graders who did not.

Although eighth-graders who had access to the Internet at home scored higher on the TIMSS 2015 mathematics assessment than those who did not in nearly all participating countries, the size of the difference in mathematics scores varied by country. The mathematics score difference with respect to internet access ranged from no measurable difference in Slovenia and Kazakhstan to 117 points in Hungary. In the United States, the difference in the average mathematics scores between eighth-graders who did have access to the Internet at home and those who did not was 50 points—a difference that was not measurably different than the TIMSS average difference (51 points). However, the mathematics score difference between those who did and did not have access to the Internet at home was greater than the difference in the United States in seven countries. Conversely, six countries had a score difference that was smaller than the corresponding score difference in the United States. The remaining 22 countries had mathematics score differences that were not measurably different from the score difference in the United States.

Figure 19.3. Average mathematics scores of eighth-graders, by country or other education system and frequency of computer or tablet use for schoolwork at home: 2015



See notes on next page.

▲ The size of the difference in mathematics scores between those who used a computer or tablet for school work at home never or almost never and those who did so every day or almost every day is greater than in the United States.
▼ The size of the difference in mathematics scores between those who used a computer or tablet for school work at home never or almost never and those who did so every day or almost every day is smaller than in the United States.
◊ The size of the difference in mathematics scores between those who used a computer or tablet for school work at home never or almost never and those who did so every day or almost every day is not measurably different from the corresponding difference in the United States.
[1] Most of the education systems represent complete countries, but some represent subnational entities.
[2] National Defined Population covers 90 to 95 percent of National Target Population as defined by TIMSS.
[3] Data for Canada include only students from the provinces of Alberta, Manitoba, Newfoundland, Ontario, and Quebec.
[4] National Target Population does not include all of the International Target Population as defined by TIMSS.
[5] Met guidelines for sample participation rates only after replacement schools were included.
[6] Norway collected data from students in their ninth year of schooling rather than in grade 8 because year 1 in Norway is considered the equivalent of kindergarten rather than the first year of primary school.
[7] National Defined Population covers less than 90 percent of the National Target Population (but at least 77 percent) as defined by TIMSS.
[8] The international average includes only education systems that are members of the International Association for the Evaluation of Educational Achievement (IEA), which develops and implements TIMSS at the international level.
[9] The TIMSS & PIRLS International Study Center has reservations about the reliability of the average achievement score because the percentage of students with achievement too low for estimation exceeds 15 percent, though it is less than 25 percent.
[10] The TIMSS & PIRLS International Study Center has reservations about the reliability of the average achievement score because the percentage of students with achievement too low for estimation exceeds 25 percent.
NOTE: Trends in International Mathematics and Science Study (TIMSS) scores are reported on a scale from 0 to 1,000, with the scale centerpoint set at 500 and the standard deviation set at 100. Countries and other education systems were required to draw probability samples of students who were nearing the end of their eighth year of formal schooling (counting the first year of primary school as year 1), provided that the mean age at the time of testing was at least 13.5 years.
SOURCE: International Association for the Evaluation of Educational Achievement (IEA), Trends in International Mathematics and Science Study (TIMSS), 2015. See *Digest of Education Statistics 2016*, table 602.32a.

In 27 countries, including the United States, eighth-graders who used a computer for schoolwork at home every day or almost every day had higher average mathematics scores in 2015 than eighth-graders who never or almost never used a computer for schoolwork at home. In the United States, eighth-graders who used a computer for schoolwork at home every day or almost every day had an average mathematics score of 521, compared with an average score of 495 for eighth-graders who never or almost never did. In contrast, in Japan, eighth-graders who never or almost never used a computer for schoolwork at home scored 19 points higher on the mathematics assessment on average than eighth-graders who used a computer for schoolwork at home every day or almost every day. In the remaining nine countries, the average mathematics score of eighth-graders who used a computer for schoolwork at home every day or almost every day was not measurably different from the average score for eighth-graders who never or almost never did.

Endnotes:

[1] Associations between socioeconomic characteristics and DLR access are presented in Section 1 of this report.
[2] Most of the education systems represent complete countries, but some represent subnational entities.
[3] Armenia participated in the eighth-grade assessment, but its data were not included in the International Database. Thus, Armenia is not included in this analysis.

Reference tables: Tables 8.1 and 8.2.

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Indicator 20

International Comparisons of Science Scores by Student Computer Use and Internet Access at Home and at School

In 35 out of 37 assessed countries and other education systems in 2015, eighth-graders who had access to their own or a shared computer at home had higher TIMSS science scores than those who did not have access to a computer at home. In the United States, eighth-graders who had access to a computer at home had an average science score of 532, compared with an average score of 491 for eighth-graders who did not.

This indicator uses data from the science assessment of the 2015 Trends in International Mathematics and Science Study (TIMSS 2015) to examine differences between the performance of eighth-graders who had access to computers (including tablets) and the Internet at home and at school and the performance of those who did not. Achievement gaps between those who reported using a computer at home/having access to the Internet at home and those who did not could be influenced by other factors, including socioeconomic background characteristics such as parents' educational attainment and family income.[1] In 2015, the eighth-grade TIMSS assessment was administered in 38 participating countries and other educational systems.[2] Thirty-seven of these countries and other education systems are included in this analysis.[3] The TIMSS 2015 assessment was administered in a paper-and-pencil format, but countries could elect to administer the school, teacher, and/or home questionnaires online. TIMSS 2015 results are reported on a scale from 0 to 1,000, with the scale center point set at 500 and the standard deviation set at 100.

Figure 20.1. Average science scores of eighth-graders, by country or other education system and whether they have access to their own or a shared computer or tablet at home: 2015

See notes on next page.

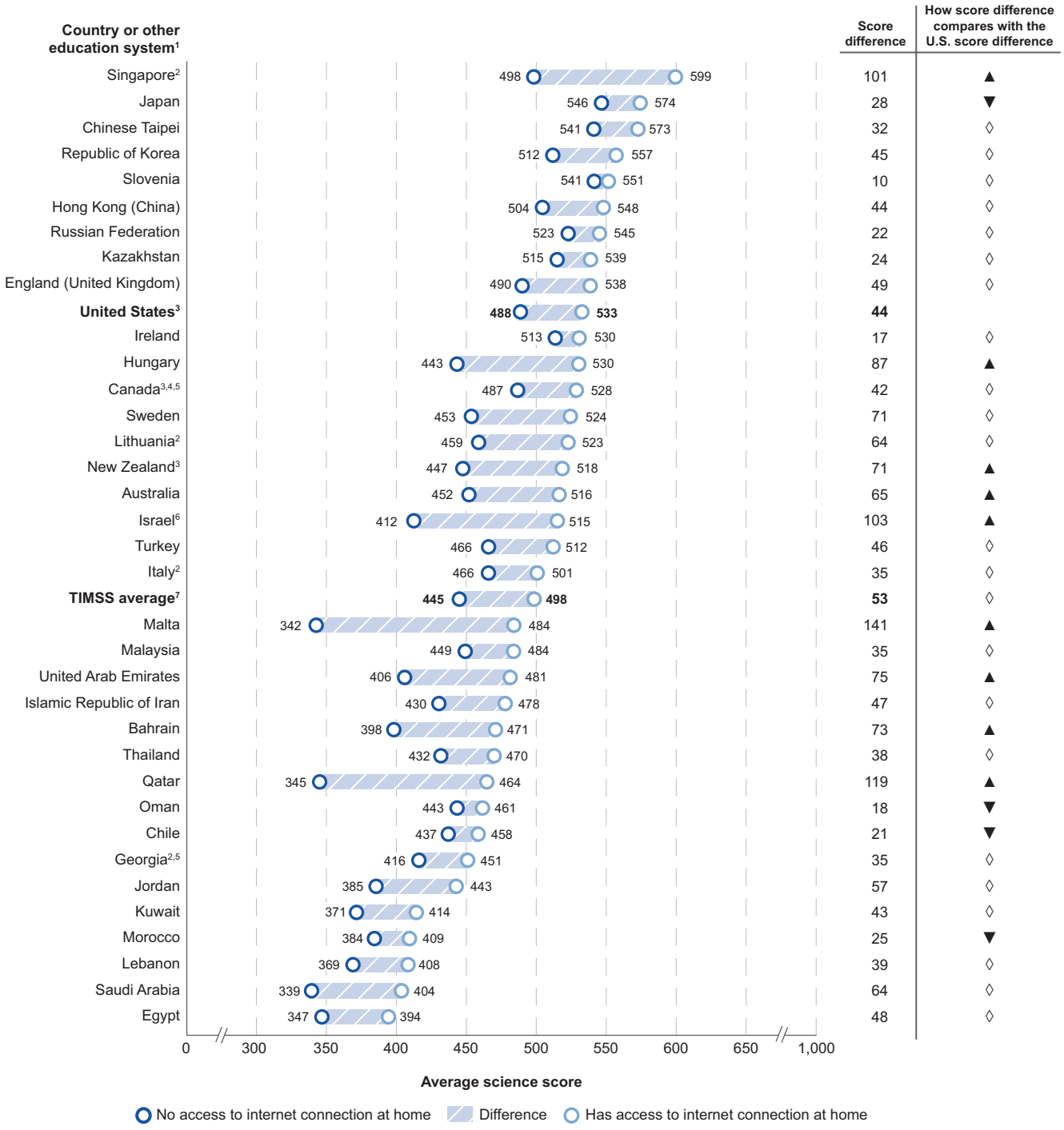
▲ The size of the difference in science scores between those who did and did not have access to a computer at home is greater than in the United States.
▼ The size of the difference in science scores between those who did and did not have access to a computer at home is smaller than in the United States.
◊ The size of the difference in science scores between those who did and did not have access to a computer at home is not measurably different from the corresponding difference in the United States.
[1] Most of the education systems represent complete countries, but some represent subnational entities.
[2] National Defined Population covers 90 to 95 percent of National Target Population as defined by TIMSS.
[3] Met guidelines for sample participation rates only after replacement schools were included.
[4] Data for Canada include only students from the provinces of Alberta, Manitoba, Newfoundland, Ontario, and Quebec.
[5] National Target Population does not include all of the International Target Population as defined by TIMSS.
[6] National Defined Population covers less than 90 percent of the National Target Population (but at least 77 percent) as defined by TIMSS.
[7] Norway collected data from students in their ninth year of schooling rather than in grade 8 because year 1 in Norway is considered the equivalent of kindergarten rather than the first year of primary school.
[8] The international average includes only education systems that are members of the International Association for the Evaluation of Educational Achievement (IEA), which develops and implements TIMSS at the international level.
NOTE: Trends in International Mathematics and Science Study (TIMSS) scores are reported on a scale from 0 to 1,000, with the scale centerpoint set at 500 and the standard deviation set at 100. Countries and other education systems were required to draw probability samples of students who were nearing the end of their eighth year of formal schooling (counting the first year of primary school as year 1), provided that the mean age at the time of testing was at least 13.5 years.
SOURCE: International Association for the Evaluation of Educational Achievement (IEA), Trends in International Mathematics and Science Study (TIMSS), 2015. See *Digest of Education Statistics 2016*, table 602.33a.

On the TIMSS 2015 science assessment, eighth-graders in the United States who had access to their own or a shared computer or tablet at home scored higher than those who did not have access at home. The average eighth-grade science score was 532 for eighth-graders who had access to a computer at home, compared with 491 for those who did not. As a comparison, in Canada, the average eighth-grade science score was 528 for eighth-graders who had access to a computer at home, compared with 497 for those who did not. The TIMSS average science score was also higher for eighth-graders who had access to a computer at home (496) than for those who did not (444). This same pattern was observed for nearly all countries that participated in TIMSS 2015. The exceptions were the Russian Federation and Slovenia; in these two countries, the average science scores of eighth-graders who had access to a computer at home were not measurably different from those of eighth-graders who did not have access at home.

Although eighth-graders who had access to their own or a shared computer or tablet at home scored higher on the TIMSS 2015 science assessment than those who did not in nearly all participating countries, the size of the difference in science scores between those who did and did not have access to a computer at home varied by country. The science score difference between those who did and did not have access to a computer at home ranged from no measurable difference in the Russian Federation and Slovenia to 106 points in Qatar. In the United States, the difference in the average science score between eighth-graders who did have access to a computer at home and those who did not was 40 points—a difference that was not measurably different than the TIMSS average difference (52 points). However, the science score difference between those who did and did not have access to a computer at home was greater than the difference in the United States in 11 countries, including Singapore and Australia. Conversely, two countries (Morocco and Slovenia) had score differences that were smaller than the corresponding score difference in the United States. The remaining 23 countries had science score differences that were not measurably different from the score difference in the United States.

The same patterns were not observed across countries with regard to students' access to computers during science lessons at school. In 26 countries, there were no measurable differences in the average science scores of eighth-graders who had access to computers during science lessons at school and those who did not. Conversely, eighth-graders who had access to computers during science lessons at school scored higher than those who did not in 11 countries, including the United States.

Figure 20.2. Average science scores of eighth-graders, by country or other education system and whether they have access to the Internet at home: 2015



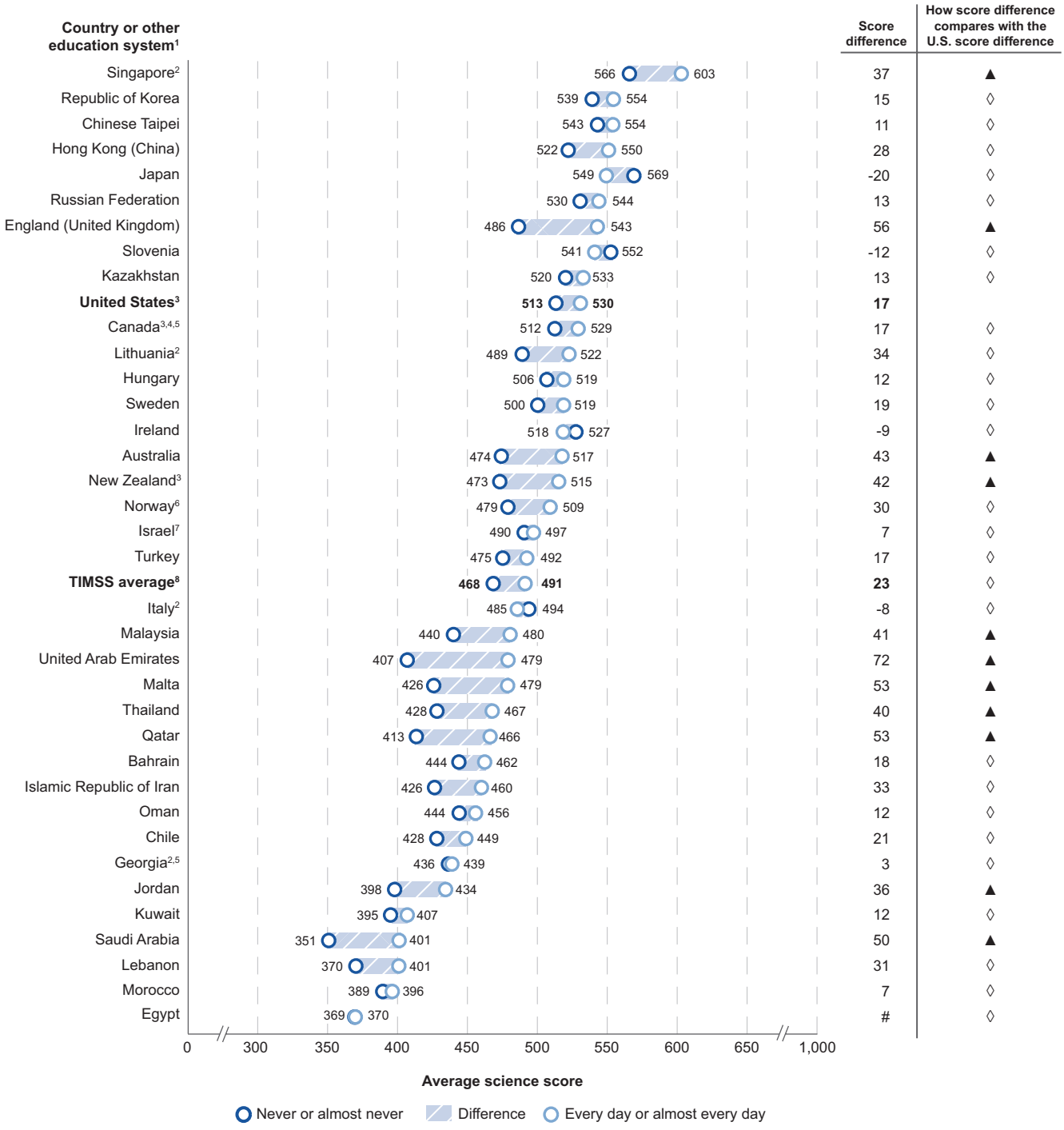
See notes on next page.

▲ The size of the difference in science scores between those who did and did not have access to an internet connection at home is greater than in the United States.
▼ The size of the difference in science scores between those who did and did not have access to an internet connection at home is smaller than in the United States.
◊ The size of the difference in science scores between those who did and did not have access to an internet connection at home is not measurably different from the corresponding difference in the United States.
[1] Most of the education systems represent complete countries, but some represent subnational entities.
[2] National Defined Population covers 90 to 95 percent of National Target Population as defined by TIMSS.
[3] Met guidelines for sample participation rates only after replacement schools were included.
[4] Data for Canada include only students from the provinces of Alberta, Manitoba, Newfoundland, Ontario, and Quebec.
[5] National Target Population does not include all of the International Target Population as defined by TIMSS.
[6] National Defined Population covers less than 90 percent of the National Target Population (but at least 77 percent) as defined by TIMSS.
[7] The international average includes only education systems that are members of the International Association for the Evaluation of Educational Achievement (IEA), which develops and implements TIMSS at the international level.
NOTE: Norway is excluded from the figure due to a small sample size for students who did not have access to an internet connection at home. Trends in International Mathematics and Science Study (TIMSS) scores are reported on a scale from 0 to 1,000, with the scale centerpoint set at 500 and the standard deviation set at 100. Countries and other education systems were required to draw probability samples of students who were nearing the end of their eighth year of formal schooling (counting the first year of primary school as year 1), provided that the mean age at the time of testing was at least 13.5 years.
SOURCE: International Association for the Evaluation of Educational Achievement (IEA), Trends in International Mathematics and Science Study (TIMSS), 2015. See *Digest of Education Statistics 2016*, table 602.33a.

On the TIMSS 2015 science assessment, eighth-graders in the United States who had access to the Internet at home scored higher than those who did not have access at home. The average eighth-grade science score was 533 for eighth-graders who had access to the Internet at home, compared with 488 for those who did not. As a comparison, in England, the average eighth-grade science score was 538 for eighth-graders who had access to the Internet at home, compared with 490 for those who did not. The TIMSS average science score was also higher for eighth-graders who had access to the Internet at home (498) than for those who did not (445). This same pattern was observed for nearly all participating countries. The exceptions were the Russian Federation, Ireland, and Slovenia; in these three countries, the average science scores of eighth-graders who had access to the Internet at home were not measurably different from those of eighth-graders who did not.

Although eighth-graders who had access to the Internet at home scored higher on the TIMSS 2015 science assessment than those who did not in nearly all participating countries, the size of the difference in science scores varied by country. The science score difference with respect to internet access ranged from no measurable difference in the Russian Federation, Ireland, and Slovenia to 141 points in Malta. In the United States, the difference in the average science scores between eighth-graders who did have access to the Internet at home and those who did not was 44 points—a difference that was not measurably different than the TIMSS average difference (53 points). However, the science score difference between those who did and did not have access to the Internet at home was greater than the difference in the United States in nine countries: Malta, Qatar, Israel, Singapore, Hungary, the United Arab Emirates, Bahrain, New Zealand, and Australia. Conversely, four countries (Japan, Morocco, Chile, and Oman) had score differences that were smaller than the corresponding score difference in the United States. The remaining 22 countries had science score differences that were not measurably different from the score difference in the United States.

Figure 20.3. Average science scores of eighth-graders, by country or other education system and frequency of computer or tablet use for schoolwork at home: 2015



See notes on next page.

▲ The size of the difference in science scores between those who used a computer or tablet for school work at home never or almost never and those who did so every day or almost every day is greater than in the United States.
▼ The size of the difference in science scores between those who used a computer or tablet for school work at home never or almost never and those who did so every day or almost every day is smaller than in the United States.
◊ The size of the difference in science scores between those who used a computer or tablet for school work at home never or almost never and those who did so every day or almost every day is not measurably different from the corresponding difference in the United States.
Rounds to zero.
[1] Most of the education systems represent complete countries, but some represent subnational entities.
[2] National Defined Population covers 90 to 95 percent of National Target Population as defined by TIMSS.
[3] Met guidelines for sample participation rates only after replacement schools were included.
[4] Data for Canada include only students from the provinces of Alberta, Manitoba, Newfoundland, Ontario, and Quebec.
[5] National Target Population does not include all of the International Target Population as defined by TIMSS.
[6] Norway collected data from students in their ninth year of schooling rather than in grade 8 because year 1 in Norway is considered the equivalent of kindergarten rather than the first year of primary school.
[7] National Defined Population covers less than 90 percent of the National Target Population (but at least 77 percent) as defined by TIMSS.
[8] The international average includes only education systems that are members of the International Association for the Evaluation of Educational Achievement (IEA), which develops and implements TIMSS at the international level.
NOTE: Trends in International Mathematics and Science Study (TIMSS) scores are reported on a scale from 0 to 1,000, with the scale centerpoint set at 500 and the standard deviation set at 100. Countries and other education systems were required to draw probability samples of students who were nearing the end of their eighth year of formal schooling (counting the first year of primary school as year 1), provided that the mean age at the time of testing was at least 13.5 years.
SOURCE: International Association for the Evaluation of Educational Achievement (IEA), Trends in International Mathematics and Science Study (TIMSS), 2015. See *Digest of Education Statistics 2016*, table 602.33a.

In 25 countries, including the United States, eighth-graders who used a computer for schoolwork at home every day or almost every day had higher average science scores in 2015 than eighth-graders who never or almost never used a computer for schoolwork at home. In the United States, eighth-graders who used a computer for schoolwork at home every day or almost every day had an average science score of 530, compared with an average score of 513 for eighth-graders who never or almost never did. In contrast, in Japan eighth-graders who never or almost never used a computer for schoolwork at home scored 20 points higher on the science assessment on average than eighth-graders who used a computer for schoolwork at home every day or almost every day. In the remaining 11 countries, the average science score of eighth-graders who used a computer for schoolwork at home every day or almost every day was not measurably different from the average score for eighth-graders who never or almost never did.

Endnotes:

[1] Associations between socioeconomic characteristics and DLR access are presented in Section 1 of this report.
[2] Most of the education systems represent complete countries, but some represent subnational entities.
[3] Armenia participated in the eighth-grade assessment, but its data were not included in the International Database. Thus, Armenia is not included in this analysis.

Reference tables: Tables 8.3 and 20.1.

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Indicator 21

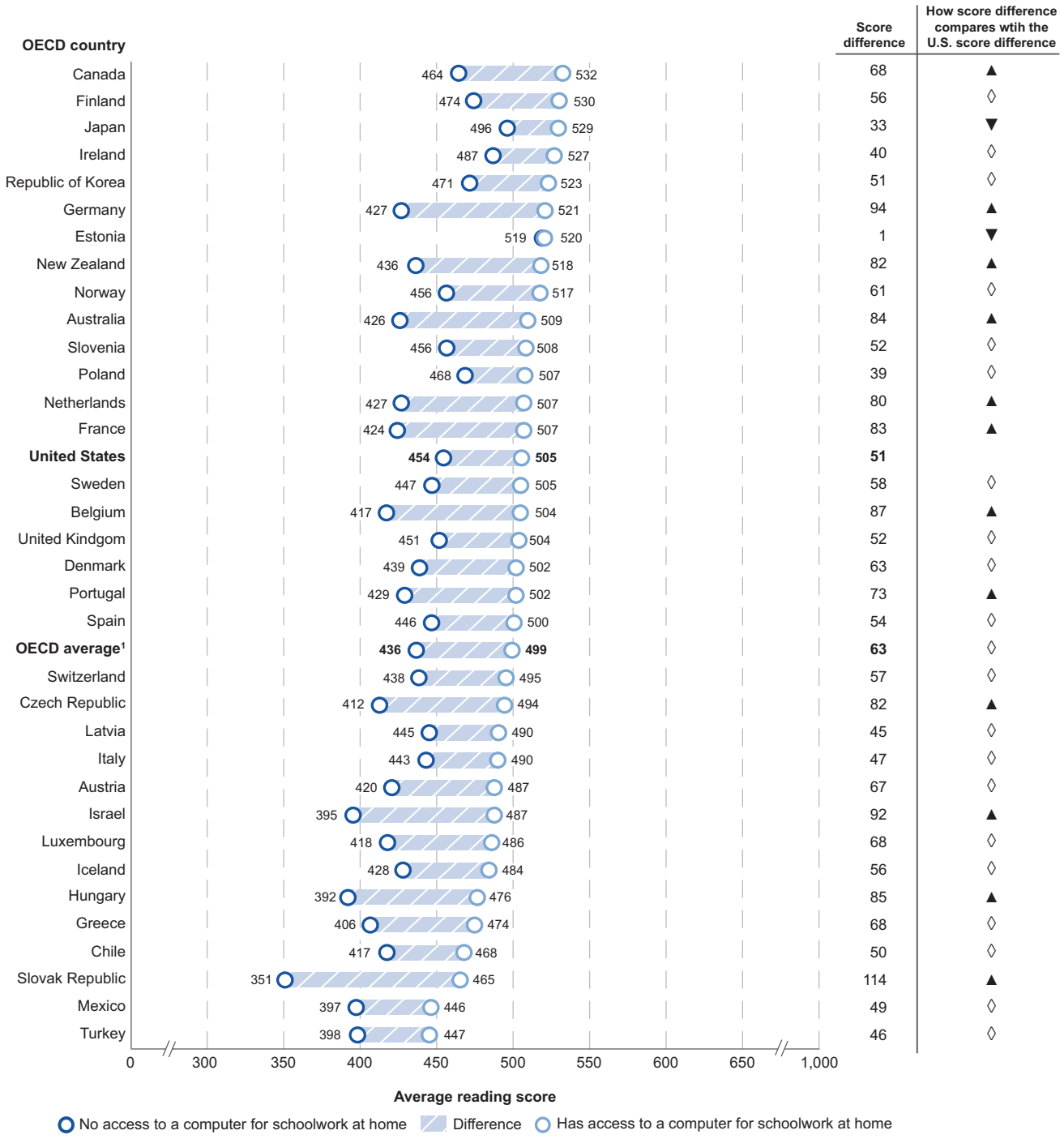
International Comparisons of Reading Literacy Scores by Student Computer Use and Internet Access at Home

In the United States and all other Organization for Economic Cooperation and Development (OECD) countries, 15-year-old students who had internet access at home had higher reading literacy scores than those who did not have internet access at home, according to the 2015 Program for International Student Assessment (PISA). For example, in the United States, 15-year-old students who had internet access at home had an average reading score of 503, while those who did not had an average score of 431.

The Program for International Student Assessment (PISA), coordinated by the Organization for Economic Cooperation and Development (OECD), has measured the performance of 15-year-old students in mathematics, science, and reading literacy every 3 years since 2000. In addition to these assessments, PISA 2015 included a student questionnaire to provide context for student performance. The questionnaire included questions on whether the student's home had a computer that could be used for schoolwork and whether the home had internet access. PISA 2015 was administered on a computer. PISA results are reported by average scale score (from 0 to 1,000), with the scale center point set at 500 and the standard deviation set at 100.

Earlier indicators in this chapter use international data from the Trends in International Mathematics and Science Study (TIMSS) to explore associations between home computer and internet access and student performance in mathematics and science in eighth grade. This indicator uses 2015 PISA data to explore associations between 15-year-old students' home computer and internet access and their performance in reading literacy. Achievement gaps between those who reported using a computer at home/having access to the Internet at home and those who did not could be influenced by other factors, including socioeconomic background characteristics such as parents' educational attainment and family income.[1] In PISA 2015, reading literacy is defined as "an individual's capacity to understand, use, reflect on and engage with written texts, in order to achieve one's goals, to develop one's knowledge and potential, and to participate in society" (OECD 2016b, p. 13). In 2015, about 87 percent of 15-year-old students in the United States had a computer in their home that could be used for schoolwork, and 94 percent had access to the Internet at home.[2] The corresponding OECD averages were 91 percent and 95 percent, respectively.

Figure 21.1. Average scores of 15-year-old students on the PISA reading literacy scale, by country and whether they had a computer to use at home for schoolwork: 2015



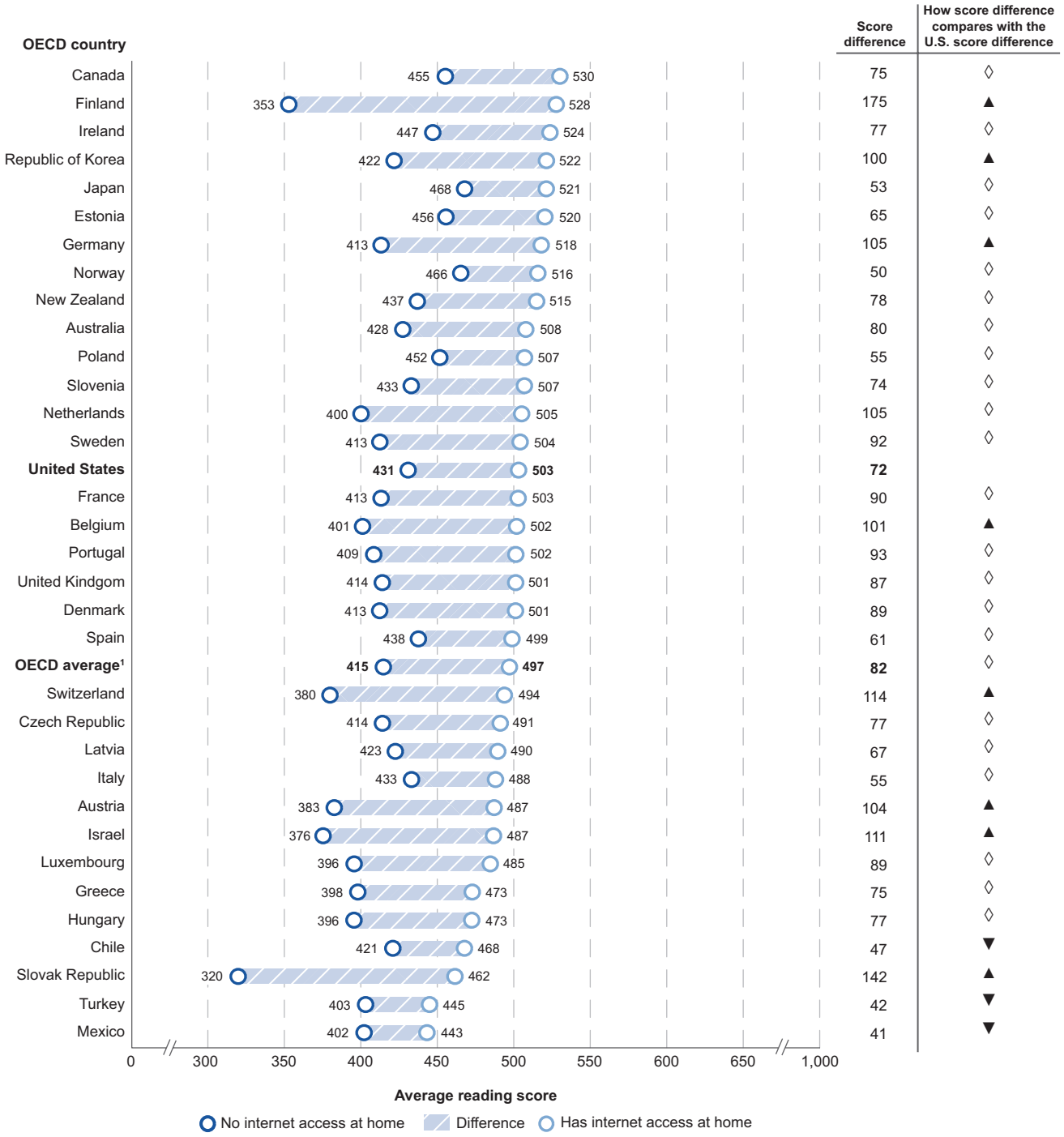
▲ The size of the difference in reading literacy scores between those who did and did not have a computer to use at home for schoolwork is greater than in the United States.
▼ The size of the difference in reading literacy scores between those who did and did not have a computer to use at home for schoolwork is smaller than in the United States.
◊ The size of the difference in reading literacy scores between those who did and did not have a computer to use at home for schoolwork is not measurably different from the corresponding difference in the United States.
¹ Refers to the mean of the data values for all reporting Organization for Economic Cooperation and Development (OECD) countries and subnational education systems, to which each country or subnational education system reporting data contributes equally.
NOTE: Scores are reported on a scale from 0 to 1,000.
SOURCE: Organization for Economic Cooperation and Development (OECD), Program for International Student Assessment (PISA), 2015. See *Digest of Education Statistics 2016*, table 602.45.

On the PISA 2015 reading literacy assessment, 15-year-old students in the United States who had a computer to use at home for schoolwork had higher average scores than those who did not. The average reading literary score was 505 for 15-year-olds who had a computer to use at home for schoolwork, compared with 454 for those who did not. This pattern was observed for nearly all OECD countries. For example, in Canada, the average reading literacy score was 532 for 15-year-old students who had a computer to use at home for schoolwork, compared with 464 for those who did not. The one exception was Estonia, where average reading literacy scores were not measurably different between students who had a computer to use at home for schoolwork and those who did not.

Although 15-year-olds who had a computer to use at home for schoolwork scored higher on the PISA 2015 reading literacy assessment than those who did not in nearly all OECD countries, the size of the difference in average reading literacy scores between those who did and did not have a computer to use at home varied by country: The reading literacy score difference between those who did and did not have a computer to use at home ranged from no measurable difference in Estonia to 114 points in the Slovak Republic. In the United States, the score difference was 51 points—a difference that was not measurably different from the OECD average difference (63 points). However, 12 OECD countries had score differences that were greater than the U.S. score difference. Conversely, one country (Japan) had score differences that were smaller than the U.S. score difference. The remaining 20 countries had reading literacy score differences that were not measurably different from the U.S. score difference.

In addition to the 35 OECD countries that participated in PISA 2015, Massachusetts and North Carolina also participated in PISA 2015 as separate education systems. These two educational systems opted to have separate samples of public school students in order to obtain results separately from the nation. In Massachusetts and North Carolina, 15-year-old students who had a computer to use at home for schoolwork had higher average reading literary scores than those without a computer. The score differences in Massachusetts (75 points) and North Carolina (64 points) were not measurably different from the U.S. (51 points) and OECD average (63 points) score differences.

Figure 21.2. Average reading scores of 15-year-old students in Organization for Economic Cooperation and Development (OECD) countries, by country and whether they had access to the Internet at home: 2015



▲ The size of the difference in reading literacy scores between those who did and did not have internet access at home is greater than in the United States.
▼ The size of the difference in reading literacy scores between those who did and did not have internet access at home is smaller than in the United States.
◊ The size of the difference in reading literacy scores between those who did and did not have internet access at home is not measurably different from the corresponding difference in the United States.
¹ Refers to the mean of the data values for all reporting Organization for Economic Cooperation and Development (OECD) countries and subnational education systems, to which each country or subnational education system reporting data contributes equally.
NOTE: Scores are reported on a scale from 0 to 1,000. Iceland is excluded from this figure because reliable data were not available for all categories.
SOURCE: Organization for Economic Cooperation and Development (OECD), Program for International Student Assessment (PISA), 2015. See *Digest of Education Statistics 2016*, table 602.45.

On the PISA 2015 reading assessment, 15-year-old students in the United States who had internet access at home had higher average scores in reading literacy than those who did not. The average reading literary score was 503 for 15-year-olds who had internet access at home, compared with 431 for those who did not. This pattern was observed for nearly all OECD countries.[3] For example, in Canada, the average reading literacy score was 530 for 15-year-old students who had internet access at home, compared with 455 for those who did not.

Although 15-year-old students who had internet access at home scored higher on the PISA 2015 reading literacy assessment than those who did not in nearly all OCED countries, the size of the difference in average reading literacy scores between those who did and did not have internet access at home varied by country: The reading literacy score difference between those who did and did not have internet access at home ranged from 41 points in Mexico to 175 points in Finland. In the United States, the score difference was 72 points—a difference that was not measurably different from the OCED average difference (82 points). However, eight OECD countries had score differences that were greater than the U.S. score difference. Conversely, three countries (Chile, Turkey, and Mexico) had score differences that were smaller than the U.S. score difference. The remaining 22 OECD countries had reading literacy score differences that were not measurably different from the U.S. score difference.

Similarly, in Massachusetts and North Carolina, 15-year-old students who had internet access at home had higher average reading literary scores than those without internet access. North Carolina's score difference (51 points) was smaller than the OECD average score difference, but not measurably different from the U.S. score difference. The score difference in Massachusetts (71 points) was not measurably different from the U.S. (72 points) and OECD average (82 points) score differences.

Endnotes:

[1] Associations between socioeconomic characteristics and DLR access are presented in Section 1 of this report.

[2] These estimates are available through the OECD PISA International Data Explorer: http://piaacdataexplorer.oecd.org/ide/idepisa/report.aspx?p=1-RMS-1-20153-PVREAD-ST013506-IN3,USA-RP_RP-Y_J-0-0-5&Lang=1033 (home internet access) and http://piaacdataexplorer.oecd.org/ide/idepisa/report.aspx?p=1-RMS-1-20153-PVREAD-ST013504-IN3,USA-RP_RP-Y_J-0-0-5&Lang=1033 (access to a home computer for schoolwork).

[3] Iceland is excluded from this analysis because reliable data were not available for this category.

Reference tables: Table 21.1.

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Indicator 22

Problem Solving in Technology-Rich Environments Among 16- to 19-Year-Olds: National and International Comparisons

Overall, 4 percent of U.S. 16- to 19-year-olds performed at the highest proficiency level (level 3) on the Program for the International Assessment of Adult Competencies (PIAAC) problem solving in technology-rich environments scale, 31 percent performed at level 2, 47 percent performed at level 1, and 18 percent performed at the lowest proficiency level (below level 1). The percentage of U.S. 16- to 19-year-olds performing at the lowest proficiency level was higher than the OECD average (12 percent).

The Program for the International Assessment of Adult Competencies (PIAAC) is a large-scale survey that assesses and compares adult skills in literacy, reading components, numeracy, and problem solving in technology-rich environments around the world. The survey is administered by answering questions via computer, although the survey can also be implemented via paper-and-pencil. PIAAC is developed and organized by the Organization for Economic Cooperation and Development (OECD).

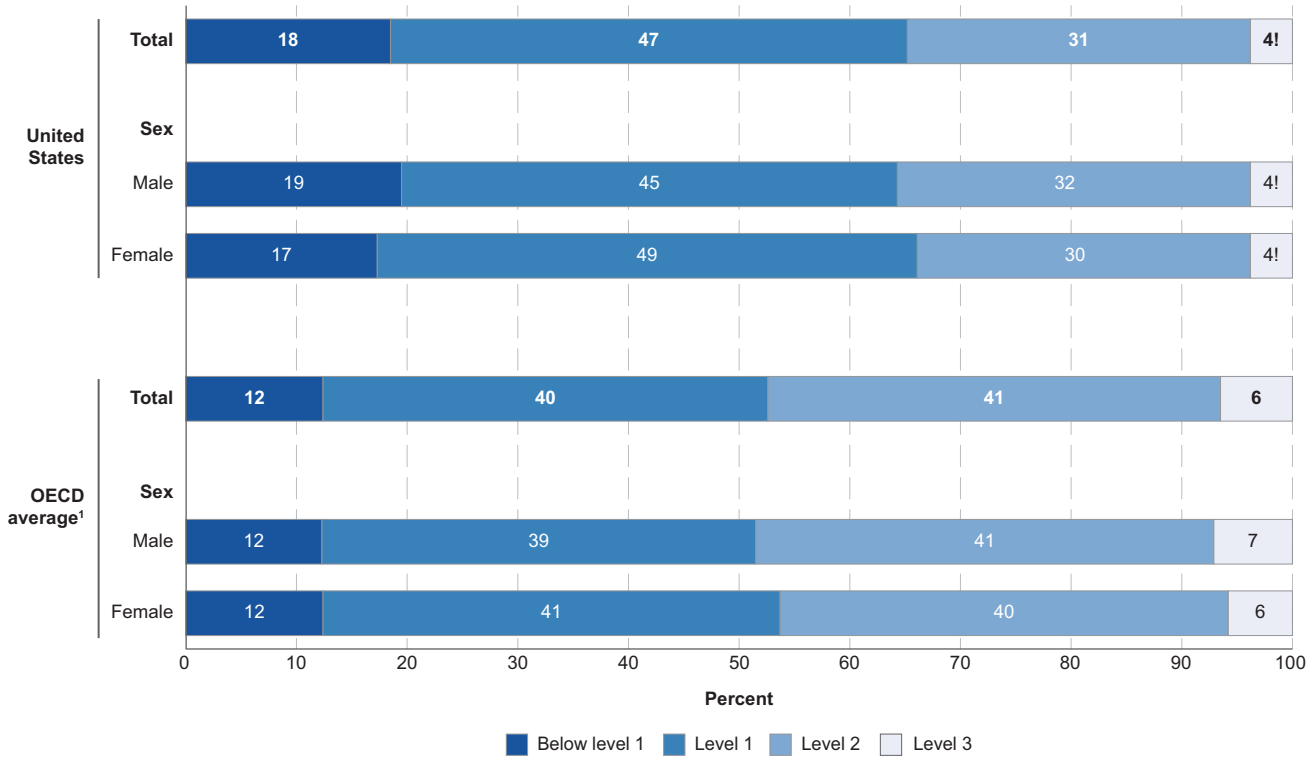
Problem solving and other cognitive skills in technology-rich environments are increasingly important in the economy and society of the 21st century. Problem solving in technology-rich environments is defined in PIAAC as using digital technology, communication tools, and networks to acquire and evaluate information, communicate with others, and perform practical tasks. PIAAC survey items in this domain present tasks of varying difficulty in simulated software applications using commands and functions commonly found in email, web pages, and spreadsheets.

Using PIAAC data from 2012, 2014, and 2015, this indicator describes the performance of U.S. 16- to 19-year-olds on the problem solving in technology-rich environments scale and differences in scores with respect to individual and family characteristics. In addition, this indicator compares the performance of U.S. 16- to 19-year-olds with their peers from selected OECD[1] and non-OECD countries and subnational educational systems. Although the indicator does not examine access to digital learning resources outside of the classroom, it does provide a general snapshot of 16- to 19-year-olds' capability of using digital learning resources by examining their performance in problem solving in technology-rich environments.

PIAAC reports four levels for the problem solving in technology-rich environments scale: below level 1, level 1, level 2, and level 3. Tasks at a higher level require using specific as well as generic technology applications, using multiple functions and navigation, performing a greater number of steps, generating subgoals, evaluating information, and applying higher-level forms of reasoning.[2] This indicator primarily focuses on discussions about the lowest (below level 1) and highest (level 3) proficiency levels. However, most analyses are limited to the lowest proficiency level due to the small percentage of 16- to 19-year-olds performing at the highest proficiency level.

Caution should be used when comparing performance on the PIAAC performance of problem solving in technology-rich environments scale across countries. The percentage of respondents assessed in this domain varied widely from country to country, because items on problem solving in technology-rich environments were administered only on computers. Some respondents elected not to take a computer-based assessment or were unable to do so because they had limited or no familiarity with computers. For these reasons, 7 percent of U.S. 16- to 19-year-olds were not assessed in problem solving in technology-rich environments. The percentage of 16- to 19-year-olds who were not assessed in problem solving in technology-rich environments ranged from 2 percent (Belgium and Slovenia) to 34 percent (Turkey) across OECD countries. In the United States and across the OECD, a higher percentage of male than female 16- to 19-year-olds were not assessed in the scale. A higher percentage of U.S. 16- to 19-year-olds with neither parent attaining a high school degree were not assessed in the scale compared to those who had at least one parent with a college degree. Across the OECD, a higher percentage of 16- to 19-year-olds with neither

Figure 22.1. Percentage distribution of 16- to 19-year-olds assessed in the problem solving in technology-rich environments domain for the United States and the OECD average, by sex and proficiency level: 2012, 2014, and 2015



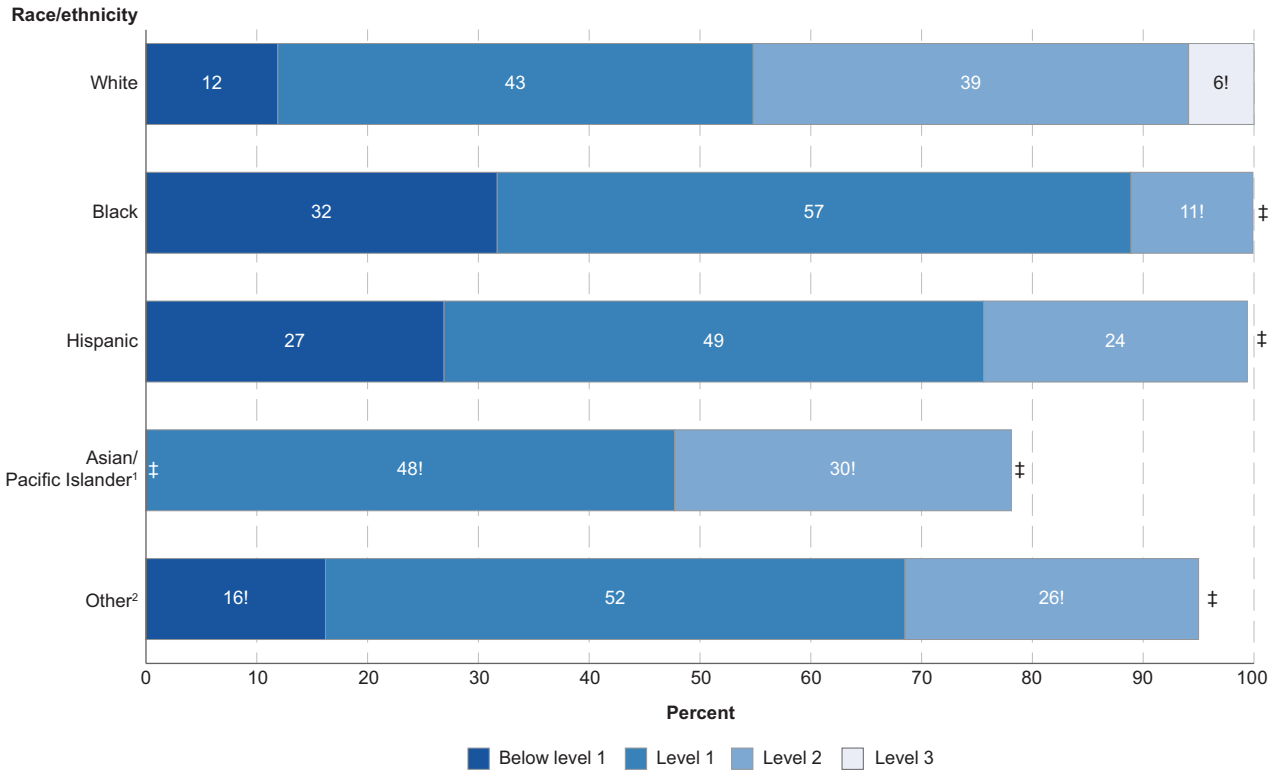
! Interpret data with caution. The coefficient of variation (CV) for this estimate is between 30 and 50 percent.
[1] Refers to the mean of the data values for all reporting Organization for Economic Cooperation and Development (OECD) countries and subnational education systems, to which each country or subnational education system reporting data contributes equally.
NOTE: Program for International Assessment of Adult Competencies (PIAAC) results for the United States are based on combined data from 2012 and 2014. Results for the OECD were mostly collected in 2012, but a second round of data collection was completed in 2015 for countries that did not participate in 2012. Detail may not sum to totals because of rounding. The proficiency levels correspond to the following score ranges on a scale of 0 to 500: below level 1 (0–240.9), level 1 (241.0–290.9), level 2 (291.0–340.9), and level 3 (341.0–500.0). Tasks at a higher level are more demanding in terms of requirements such as using specific as well as generic technology applications, using multiple functions and navigation, performing a greater number of steps, generating subgoals, evaluating information, and applying higher level forms of reasoning. For detailed descriptions of each proficiency level, as well as specific examples of tasks at each level, see appendix B of the report *Skills of U.S. Unemployed, Young, and Older Adults in Sharper Focus* (NCES 2016-039rev), available at http://nces.ed.gov/pubs2016/2016039rev.pdf. Seven percent of U.S. 16- to 19-year-olds were not assessed in problem solving in technology-rich environments. The percentage of 16- to 19-year-olds who were not assessed in problem solving in technology-rich environments ranged from 2 to 34 percent across OECD countries.
SOURCE: U.S. Department of Education, National Center for Education Statistics, Program for the International Assessment of Adult Competencies (PIAAC), U.S. PIAAC 2012/2014; Organization for Economic Cooperation and Development, PIAAC 2012 and 2015. See *Digest of Education Statistics 2016*, table 604.50.

parent attaining a high school degree were not assessed in the scale compared to those who had at least one parent with a high school or college degree.

Overall, 18 percent of U.S. 16- to 19-year-olds performed at the lowest proficiency level (below level 1) on the problem solving in technology-rich environments scale, 47 percent performed at level 1, 31 percent performed at level 2, and 4 percent performed at the highest proficiency level (level 3). The percentage of U.S. 16- to 19-year-olds performing at the lowest proficiency level was larger than the OECD average[3] (18 vs. 12 percent). In contrast, the percentage of U.S. 16- to 19-year-olds scoring at level 2 was smaller than the OECD average (31 vs. 41 percent). There were no measurable differences between the United States and the OECD average percentages of 16- to 19-year-olds performing at either level 1 or the highest proficiency level (level 3).

No measurable gaps were observed between the percentages of U.S. male and female 16- to 19-year-olds at each proficiency level on the problem solving in technology-rich environments scale. This pattern was also observed for the OECD average percentages at each level. However, the percentage of U.S. males performing at the lowest proficiency level was larger than the OECD average (19 vs. 12 percent).

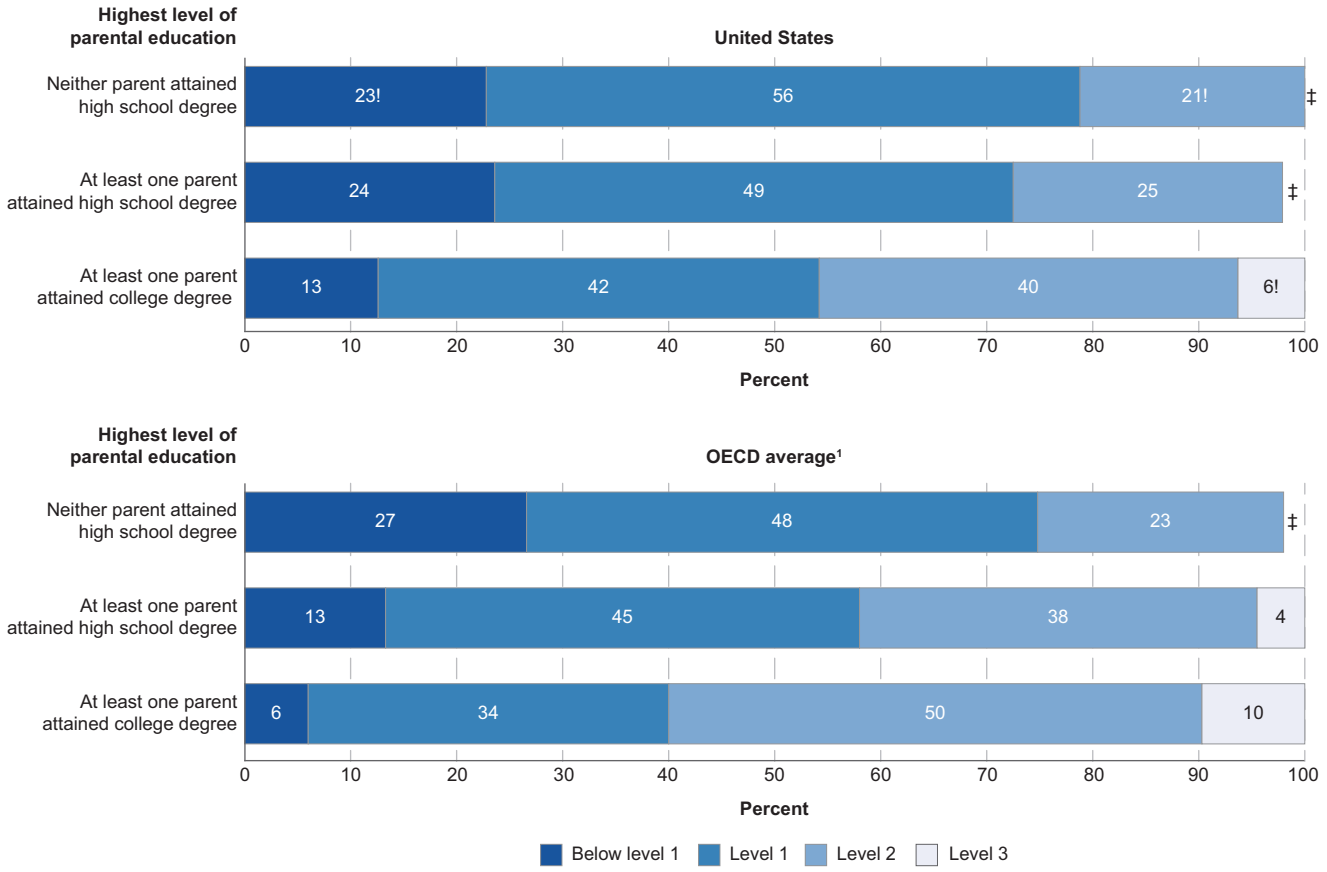
Figure 22.2. Percentage distribution of U.S. 16- to 19-year-olds assessed in the problem solving in technology-rich environments domain, by race/ethnicity and proficiency level: 2012 and 2014



! Interpret data with caution. The coefficient of variation (CV) for this estimate is between 30 and 50 percent.
‡ Reporting standards not met. Either there are too few cases for a reliable estimate or the coefficient of variation (CV) is 50 percent or greater.
[1] The percentage of Asian/Pacific Islander 16- to 19-year-olds performing at below level 1 on the scale did not meet the reporting standards because the coefficient of variation (CV) is 50 percent or greater.
[2] "Other" includes persons of all other races and Two or more races.
NOTE: Program for International Assessment of Adult Compentencies (PIAAC) results for the United States are based on combined data from 2012 and 2014. Results for the OECD were mostly collected in 2012, but a second round of data collection was completed in 2015 for countries that did not participate in 2012. Detail may not sum to totals because of rounding. The proficiency levels correspond to the following score ranges on a scale of 0 to 500: below level 1 (0–240.9), level 1 (241.0–290.9), level 2 (291.0–340.9), and level 3 (341.0–500.0). Tasks at a higher level are more demanding in terms of requirements such as using specific as well as generic technology applications, using multiple functions and navigation, performing a greater number of steps, generating subgoals, evaluating information, and applying higher level forms of reasoning. For detailed descriptions of each proficiency level, as well as specific examples of tasks at each level, see appendix B of the report *Skills of U.S. Unemployed, Young, and Older Adults in Sharper Focus* (NCES 2016-039rev), available at http://nces.ed.gov/pubs2016/2016039rev.pdf. Seven percent of U.S. 16- to 19-year-olds were not assessed in problem solving in technology-rich environments. The percentage of 16- to 19-year-olds who were not assessed in problem solving in technology-rich environments ranged from 2 to 34 percent across OECD countries.
SOURCE: U.S. Department of Education, National Center for Education Statistics, Program for the International Assessment of Adult Competencies (PIAAC), U.S. PIAAC 2012/2014. See *Digest of Education Statistics 2016*, table 604.50.

The percentages of U.S. 16- to 19-year-olds who performed at the lowest proficiency level on the problem solving in technology-rich environments scale varied across racial/ethnic groups. Larger percentages of Black (32 percent) and Hispanic (27 percent) 16- to 19-year-olds performed at the lowest proficiency level compared with White (12 percent) 16- to 19-year-olds.

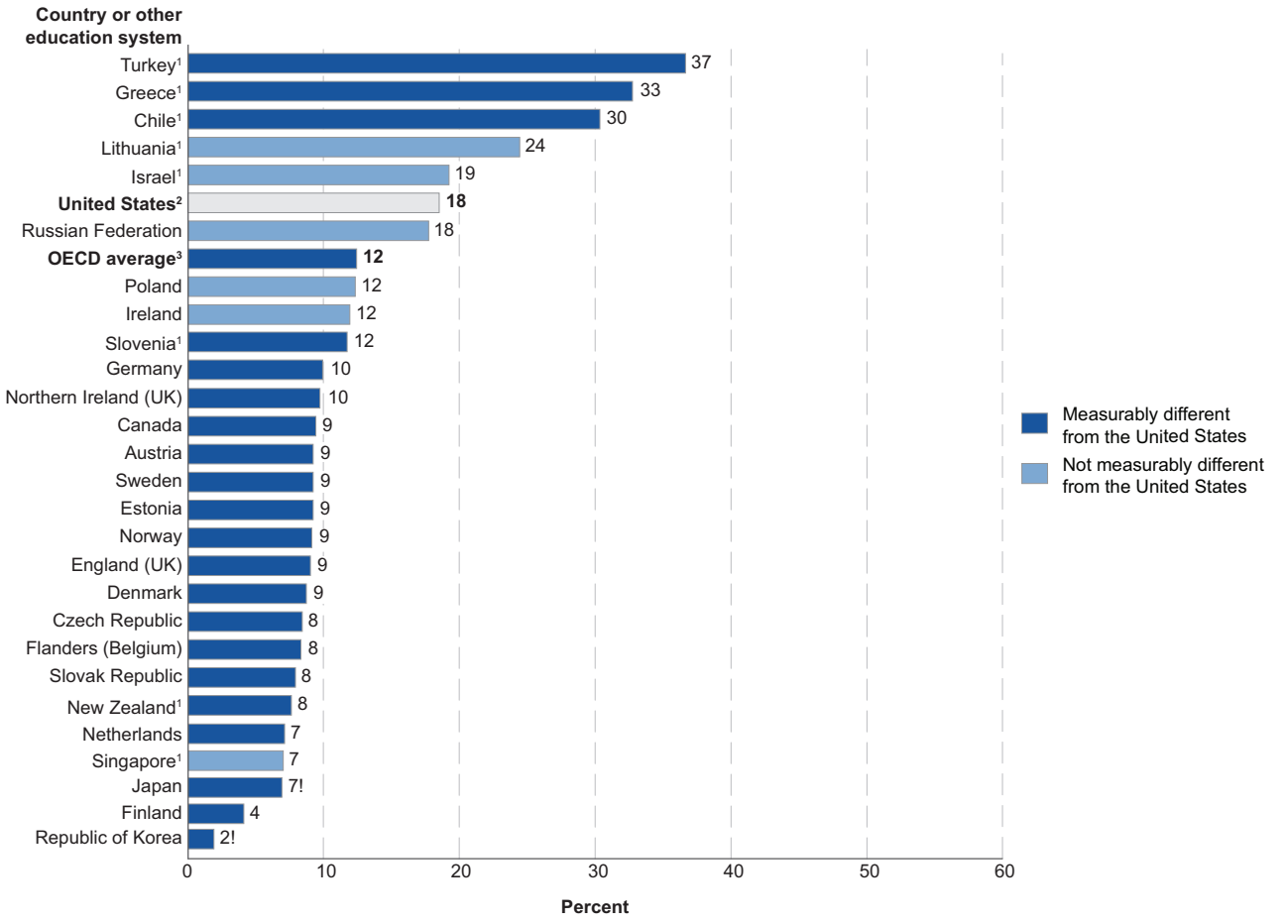
Figure 22.3. Percentage distribution of 16- to 19-year-olds assessed in the problem solving in technology-rich environments domain for the United States and the OECD average, by highest level of parental education and proficiency level: 2012, 2014, and 2015



! Interpret data with caution. The coefficient of variation (CV) for this estimate is between 30 and 50 percent.
‡ Reporting standards not met. Either there are too few cases for a reliable estimate or the coefficient of variation (CV) is 50 percent or greater.
[1] Refers to the mean of the data values for all reporting Organization for Economic Cooperation and Development (OECD) countries and subnational education systems, to which each country or subnational education system reporting data contributes equally.
NOTE: Program for International Assessment of Adult Compentencies (PIAAC) results for the United States are based on combined data from 2012 and 2014. Results for the OECD were mostly collected in 2012, but a second round of data collection was completed in 2015 for countries that did not participate in 2012. Detail may not sum to totals because of rounding. The proficiency levels correspond to the following score ranges on a scale of 0 to 500: below level 1 (0–240.9), level 1 (241.0–290.9), level 2 (291.0–340.9), and level 3 (341.0–500.0). Tasks at a higher level are more demanding in terms of requirements such as using specific as well as generic technology applications, using multiple functions and navigation, performing a greater number of steps, generating subgoals, evaluating information, and applying higher level forms of reasoning. For detailed descriptions of each proficiency level, as well as specific examples of tasks at each level, see appendix B of the report *Skills of U.S. Unemployed, Young, and Older Adults in Sharper Focus* (NCES 2016-039rev), available at http://nces.ed.gov/pubs2016/2016039rev.pdf. Seven percent of U.S. 16- to 19-year-olds were not assessed in problem solving in technology-rich environments. The percentage of 16- to 19-year-olds who were not assessed in problem solving in technology-rich environments ranged from 2 to 34 percent across OECD countries.
SOURCE: U.S. Department of Education, National Center for Education Statistics, Program for the International Assessment of Adult Competencies (PIAAC), U.S. PIAAC 2012/2014; Organization for Economic Cooperation and Development, PIAAC 2012 and 2015. See *Digest of Education Statistics 2016*, table 604.50.

The performance of 16- to 19-year-olds on the problem solving in technology-rich environments scale varied by parents' highest educational level, defined as the highest level of education attained by the most educated parent in the household. In the United States, the percentage of 16- to 19-year-olds at the lowest proficiency level was larger for those with at least one parent who had attained a high school degree (24 percent) than for those with at least one parent who had attained a college degree (13 percent). For the OECD average, the percentage of 16- to 19-year-olds performing at the lowest proficiency level was largest for those who had neither parent attaining a high school degree (27 percent) and smallest for those who had at least one parent attaining a college degree (6 percent). Compared internationally, the percentage of U.S. 16- to 19-year-olds with at least one parent attaining a high school degree scoring at the lowest proficiency level (24 percent) was larger than the OECD average for this same group (13 percent).

Figure 22.4. Percentage of 16- to 19-year-olds assessed in the problem solving in technology-rich environments domain performing at the lowest proficiency level (below level 1), by country: 2012, 2014, and 2015

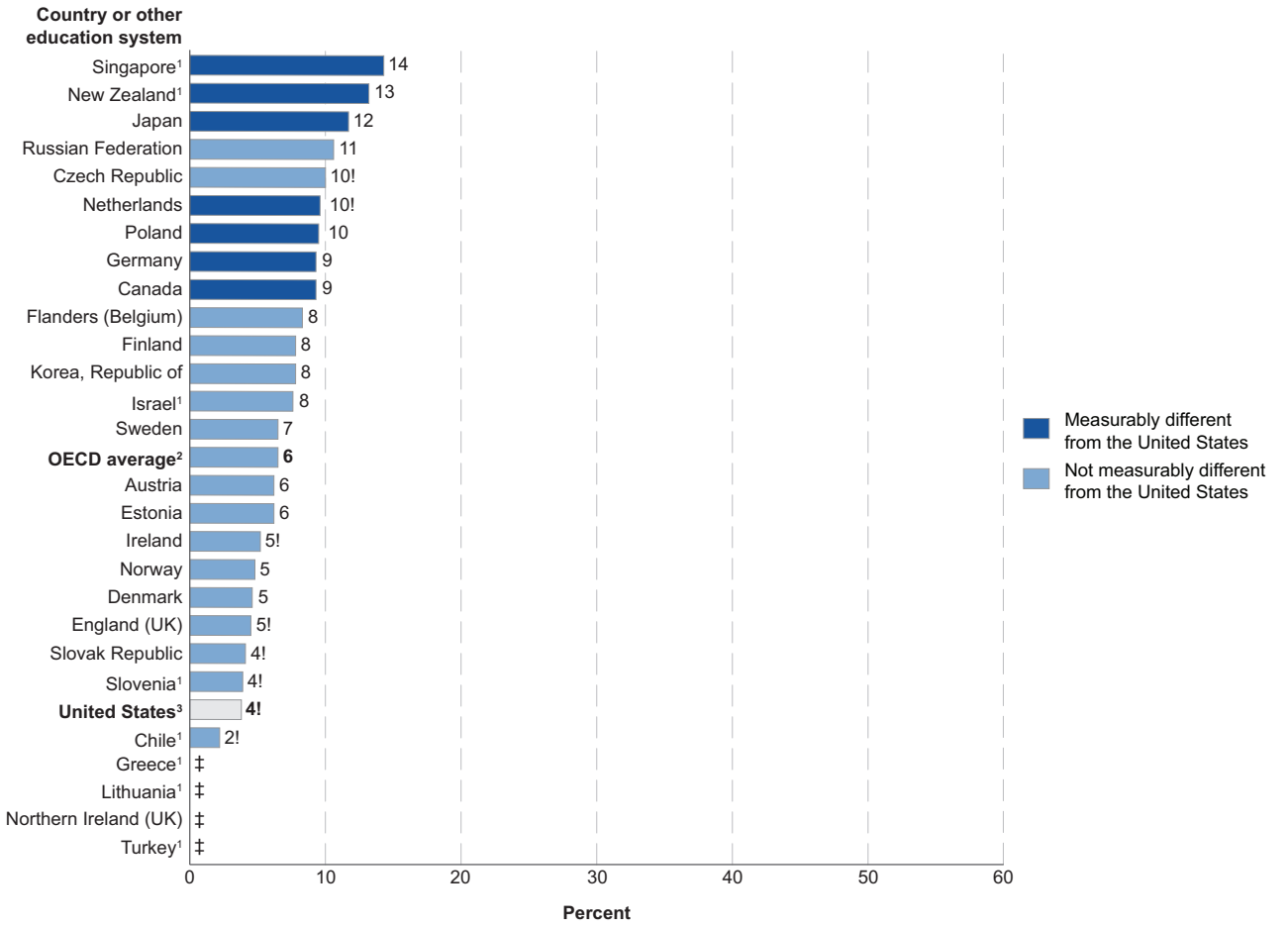


! Interpret data with caution. The coefficient of variation (CV) for this estimate is between 30 and 50 percent.
[1] Data are from 2015.
[2] A supplemental round of data collection was completed in 2014 in order to expand the sample of U.S. adults, allowing for more in-depth data analysis.
[3] Refers to the mean of the data values for all reporting Organization for Economic Cooperation and Development (OECD) countries and subnational education systems, to which each country or subnational education system reporting data contributes equally.
NOTE: Program for International Assessment of Adult Compentencies (PIAAC) results for the United States are based on combined data from 2012 and 2014. Results for the OECD were mostly collected in 2012, but a second round of data collection was completed in 2015 for countries that did not participate in 2012. The proficiency levels correspond to the following score ranges on a scale of 0 to 500: below level 1 (0–240.9), level 1 (241.0–290.9), level 2 (291.0–340.9), and level 3 (341.0–500.0). Tasks at a higher level are more demanding in terms of requirements such as using specific as well as generic technology applications, using multiple functions and navigation, performing a greater number of steps, generating subgoals, evaluating information, and applying higher level forms of reasoning. For detailed descriptions of each proficiency level, as well as specific examples of tasks at each level, see appendix B of the report *Skills of U.S. Unemployed, Young, and Older Adults in Sharper Focus* (NCES 2016-039rev), available at http://nces.ed.gov/pubs2016/2016039rev.pdf. Seven percent of U.S. 16- to 19-year-olds were not assessed in problem solving in technology-rich environments. The percentage of 16- to 19-year-olds who were not assessed in problem solving in technology-rich environments ranged from 2 to 34 percent across OECD countries.
SOURCE: U.S. Department of Education, National Center for Education Statistics, Program for the International Assessment of Adult Competencies (PIAAC), U.S. PIAAC 2012/2014; Organization for Economic Cooperation and Development, PIAAC 2012 and 2015. See *Digest of Education Statistics 2016*, table 604.50.

Among the 25 OECD countries that reported problem solving in technology-rich environments scale scores, the percentages of 16- to 19-year-olds performing at the lowest proficiency level ranged from 2 percent in the Republic of Korea to 37 percent in Turkey. The percentage of 16- to 19-year-olds performing at the lowest level in the United States (18 percent) was larger than the percentages in 18 OECD countries, smaller than the percentages in 3 OECD countries (Turkey, Greece, and Chile) and not measurably different from the percentages in 3 OECD countries (Ireland, Israel, and Poland).

Three non-OECD countries (Lithuania, the Russian Federation, and Singapore) reported scores on the problem solving in technology-rich environments scale. The United States had a larger percentage of 16- to 19-year-olds scoring at the lowest proficiency level than did Singapore (18 vs. 7 percent) and no measurable difference compared with Lithuania and the Russian Federation.

Figure 22.5. Percentage of 16- to 19-year-olds assessed in the problem solving in technology-rich environments domain performing at the highest proficiency level (level 3), by country: 2012, 2014, and 2015



! Interpret data with caution. The coefficient of variation (CV) for this estimate is between 30 and 50 percent.
‡ Reporting standards not met. Either there are too few cases for a reliable estimate or the coefficient of variation (CV) is 50 percent or greater.
[1] Data are from 2015.
[2] Refers to the mean of the data values for all reporting Organization for Economic Cooperation and Development (OECD) countries and subnational education systems, to which each country or subnational education system reporting data contributes equally.
[3] A supplemental round of data collection was completed in 2014 in order to expand the sample of U.S. adults, allowing for more in-depth data analysis.
NOTE: Program for International Assessment of Adult Compentencies (PIAAC) results for the United States are based on combined data from 2012 and 2014. Results for the OECD were mostly collected in 2012, but a second round of data collection was completed in 2015 for countries that did not participate in 2012. The proficiency levels correspond to the following score ranges on a scale of 0 to 500: below level 1 (0–240.9), level 1 (241.0–290.9), level 2 (291.0–340.9), and level 3 (341.0–500.0). Tasks at a higher level are more demanding in terms of requirements such as using specific as well as generic technology applications, using multiple functions and navigation, performing a greater number of steps, generating subgoals, evaluating information, and applying higher level forms of reasoning. For detailed descriptions of each proficiency level, as well as specific examples of tasks at each level, see appendix B of the report *Skills of U.S. Unemployed, Young, and Older Adults in Sharper Focus* (NCES 2016-039rev), available at http://nces.ed.gov/pubs2016/2016039rev.pdf. Seven percent of U.S. 16- to 19-year-olds were not assessed in problem solving in technology-rich environments. The percentage of 16- to 19-year-olds who were not assessed in problem solving in technology-rich environments ranged from 2 to 34 percent across OECD countries.
SOURCE: U.S. Department of Education, National Center for Education Statistics, Program for the International Assessment of Adult Competencies (PIAAC), U.S. PIAAC 2012/2014; Organization for Economic Cooperation and Development, PIAAC 2012 and 2015. See *Digest of Education Statistics 2016*, table 604.50.

The percentages of 16- to 19-year-olds performing at the highest proficiency level of the problem solving in technology-rich environments scale in OECD countries ranged from 2 percent in Chile to 13 percent in New Zealand.[4] The percentage of 16- to 19-year-olds performing at this level in the United States (4 percent) was smaller than the percentages in 6 OECD countries, and not measurably different from the percentages in 15 countries. With respect to non-OECD countries, the United States had a smaller percentage of 16- to 19-year-olds scoring at the highest proficiency level than did Singapore (14 percent), and no measurable difference compared with the percentage for the Russian Federation.[5]

Endnotes:

[1] France, Italy, and Spain are omitted because these OECD countries did not assess problem solving in technology-rich environments.

[2] For more information, visit https://nces.ed.gov/surveys/piaac/pstreproficiencylevel.asp.

[3] OECD average refers to the mean of the data values for all reporting OECD countries and subnational regions, to which each country or subnational region reporting data contributes equally.

[4] Data for Greece, Northern Ireland (UK), and Turkey were not available because either there were too few cases for a reliable estimate or the coefficient of variation (CV) was 50 percent or greater.

[5] Data for Lithuania were not available because either there were too few cases for a reliable estimate or the coefficient of variation (CV) was 50 percent or greater.

Reference tables: Table 22.1.

Section 4: Impact of Access to Digital Learning Resources Outside of the Classroom on Instructional Practices of Educators

Student access to digital learning resources (DLR) outside of the classroom may impact the instructional practices of educators. However, based on the results of the literature search of empirical studies published in peer-reviewed journals and government reports from 2005 to 2016, existing research on potential impacts is lacking. Thus, the included studies and their results may not be representative. The handful of relevant studies present very limited evidence regarding the relationship between teachers' knowledge of student access to and experience with DLR outside the classroom and instructional practices. A larger body of research is available on the challenges and barriers teachers and schools face in adapting instructional practices to further develop students' digital literacy skills for use of DLR both inside and outside of the classroom.

What limited research is available on teachers' perceptions of disparities in student and parent internet access at home suggests that these perceptions may impact their instructional decisions. For instance, a study conducted with 36 elementary and secondary school teachers who created course websites found that contextual barriers, including teacher perceptions that students could not access the Internet from home, resulted in the majority of teachers not using such websites on a regular basis (Friedman 2006). Teachers were concerned that parents who lacked home internet access would miss out on potential communication benefits between home and school, and that students who lacked home access would not have an equal opportunity to view and complete assignments posted on the course website. Other research found that teachers tended to underestimate student access to DLR outside of the classroom because the teachers tended to focus primarily on access to computers and did not take into account student experience with other digital technologies, such as video game consoles (Henderson 2011; Honan 2008). Based on these perceptions, the author concluded that teachers tended to focus their lessons on familiarizing students with operating computers (Honan 2008).

As student access to DLR outside of the classroom increases over time, educators may need to adapt instructional practices in an effort to incorporate home-based technology into teaching and learning. A literature review conducted by Buabeng-Andoh in 2012 discusses individual, school, and technical factors that researchers have found to be associated with teachers' use of information and communication technology in the classroom. Conclusions from the literature review suggest that at the individual level, teachers are less likely to use technology in the classroom if they lack the confidence, skills, and pedagogical training to do so; if they do not perceive a benefit of using a new technology over current instructional approaches; or if they anticipate the new approach will be difficult or time-intensive to adopt. At the school level, technology experiences may be limited by organizational structures, such as an emphasis on traditional assessment and instructional methods or on restrictive curricula. Technical-level barriers include the absence of current and well-maintained hardware or appropriate instructional software, and limited access to technology resources in the school. For example, a study by Reinhart, Thomas, and Toriskie (2011) found that teachers in more affluent schools were more likely to have access to a technology facilitator who supported teachers with additional training on how to use technology to promote higher-order thinking skills.

A second literature review conducted by Fu (2013) identifies similar barriers and challenges faced by teachers and schools as they work to integrate technology into the learning environment. Benefits of using

technology-based instructional activities in classrooms can include providing tools for students to access digital information effectively, supporting student-centered and self-directed learning, providing a creative learning environment by accessing text through different types of DLR, encouraging collaborative distance-learning, offering opportunities to develop critical thinking skills, and facilitating access to course content. However, findings from the literature review suggest that schools may face challenges or experience barriers to technology use due to students' inadequate technical skills that hinder their ability to participate in a classroom that uses DLR, students' lack of timely feedback from instructors, and their reduced interaction with classmates and teachers. In addition to the teacher- and school-level barriers noted in the Buabeng-Andoh (2012) review, Fu also breaks out the influences of DLR use into external and internal components. External factors include the availability and accessibility of technology equipment and logistical constraints such as faculty teaching and planning time and technical and administrative support. Internal factors include teachers' beliefs, attitudes, and perceptions about technology use and integration, self-confidence and technology self-efficacy, and readiness to use DLR in the classroom. Fu concluded that both internal and external factors impact the level of effort teachers put into integrating technology into their instruction.

A more recent study of 24 middle school science teachers and 1,060 students in two states also found that teachers experience barriers in their efforts to integrate technology into instruction (Wang et al. 2014). Researchers found that while teachers and students use a variety of DLR outside of the classroom, teachers' application of technology in classroom use was limited due to a lack of access to technology resources and support, a lack of technology integration skills and strategies, and a lack of time to plan for technology integration. Although students used technology outside of the classroom to work on school projects, the study found that most students were not familiar with the skills needed to use technology to solve problems, enhance productivity, or develop creativity. This study's authors concluded that after teachers introduced a new technology to support learning, students typically learned it quickly and were eager to use more technology in their classrooms.

Section 5: Interventions at State and Local Levels

State and local interventions to increase access to digital learning resources (DLR) and the Internet both inside and outside of the classroom are underway across the United States. This section describes a few examples of such interventions conducted in 2015 and 2016 (2015 being the most recent data year reported in the indicators and 2016 being the year before the report was in production). For this section, we had limited ability to address the Congressional mandate within the timeframe and scope of this report. We searched for relevant reports on technology, but did not identify any national data or evaluations addressing systematic efforts to address DLR access at home. We did identify some reports published by political organizations and advocacy groups, and provided some examples of state and local efforts from those reports. It is important to understand that these examples are not representative of all the types of efforts that are currently being made. It is likely that there are other examples of state and local initiatives that are not discussed here because reports were not produced about these efforts within the time frame that we used for our search procedures.

State-Level Interventions

The nonprofit organization EducationSuperHighway aims to provide high-speed internet access to all U.S. public school students. In the *2015 State of the States* report, EducationSuperHighway (2015) stated that an additional 20 million students were connected to high-speed internet over the past 2 years and that 38 governors had committed to the initiative of connecting their states' classrooms to high-speed broadband. For example, North Carolina launched the Wireless Networking Initiative, a statewide procurement effort that resulted in 95 percent of participating school districts having Wi-Fi access points in every classroom. New Jersey formed a statewide buying consortium for broadband services in schools that resulted in 16 percent savings on monthly costs and an average internet access bandwidth increase of 152 percent.

The State Educational Technology Directors Association (SETDA) works to ensure that students have equitable access to DLR, both inside and outside of the classroom. In the 2016 report *The Broadband Imperative II: Equitable Access for Learning*, SETDA identified three strategies that policymakers and educators can use to improve equity of access outside of school: reaching out to families about the necessity of out-of-school access, leveraging community partnerships, and sharing out-of-school access options (Fox and Jones 2016). These strategies rely on community buy-in, such as local businesses offering internet access on their premises to students. Similar local initiatives are described below.

Local-Level Interventions

At the local level, some stakeholders are using creative methods to try to help close the digital divide. Community outreach and education campaigns are often more effective than federal funding alone (LaRose et al. 2011). In 2015, the Executive Office of the President released the *Community-Based Broadband Solutions* report, encouraging the construction of broadband networks in unserved and underserved areas.

Some districts are putting wireless routers on buses or providing mobile Wi-Fi hotspots so that students can access the Internet outside of the classroom. In California, the Coachella Valley Unified School District helped low-income residents obtain access by outfitting school buses with high-speed internet for use by students on the way to and from school and in the evening hours for homes near the parked buses (U.S. Department of Education n.d.). The Vail School District in Arizona implemented a similar initiative (Fox and Jones 2016). When Cincinnati Public Schools decided to offer partially-online advanced placement (AP) courses, the school system provided mobile hotspots, called Kajeet SmartSpots, to students who did not have home broadband access (Meyer 2016). These hotspots not only allowed students to attend their AP classes, but also to complete homework. Forsyth County Schools in Georgia partnered with the Cumming-Forsyth County Chamber of Commerce to disseminate a list of organizations and businesses in the community that offered free Wi-Fi hotspots (Fox and Jones 2016).

Funding programs and providing devices for students are other common local-level strategies to increase student internet access to DLR outside the classroom. School District 87 of Bloomington, Illinois provided sixth- through eighth-graders with a digital learning device to use at both school and home (Fox and Jones 2016). Since over half of the students did not have at-home internet access, the district also decided to allocate funding to provide low-income households with access to the district's internet connection. Cincinnati's Kajeet SmartSpots program caught the interest of Green Bay Area Public Schools in Wisconsin. Instead of supplying mobile hotspots, however, the school district allowed students to "check-out" a SmartSpot laptop or other device, similar to borrowing a book from the library (Meyer 2016).

As a final example, the national nonprofit organization EveryoneOn works as a liaison between internet service providers and families that cannot afford broadband internet (Meyer 2016). The organization negotiates with internet service providers for more affordable prices for high-speed internet service and computers, and then helps inform families about these opportunities in their areas.

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Appendix A: Guide to Data Sources for Indicators

National Center for Education Statistics (NCES)

National Assessment of Educational Progress

The National Assessment of Educational Progress (NAEP) is a series of cross-sectional studies initially implemented in 1969 to assess the educational achievement of U.S. students and monitor changes in those achievements. In the main national NAEP, a nationally representative sample of students is assessed at grades 4, 8, and 12 in various academic subjects. The assessment is based on frameworks developed by the National Assessment Governing Board (NAGB). It includes both multiple-choice items and constructed-response items (those requiring written answers). Results are reported in two ways: by average score and by achievement level. Average scores are reported for the nation, for participating states and jurisdictions, and for subgroups of the population. Percentages of students performing at or above three achievement levels (*Basic, Proficient,* and *Advanced*) are also reported for these groups.

From 1990 until 2001, main NAEP was conducted for states and other jurisdictions that chose to participate. In 2002, under the provisions of the No Child Left Behind Act of 2001, all states began to participate in main NAEP, and an aggregate of all state samples replaced the separate national sample. (School district-level assessments—under the Trial Urban District Assessment [TUDA] program—also began in 2002.)

Results are available for the mathematics assessments administered in 2000, 2003, 2005, 2007, 2009, 2011, 2013, and 2015. In 2005, NAGB called for the development of a new mathematics framework. The revisions made to the mathematics framework for the 2005 assessment were intended to reflect recent curricular emphases and better assess the specific objectives for students at each grade level.

The revised mathematics framework focuses on two dimensions: mathematical content and cognitive demand. By considering these two dimensions for each item in the assessment, the framework ensures that NAEP assesses an appropriate balance of content, as well as a variety of ways of knowing and doing mathematics.

Since the 2005 changes to the mathematics framework were minimal for grades 4 and 8, comparisons over time can be made between assessments conducted before and after the framework's implementation for these grades. The changes that the 2005 framework made to the grade 12 assessment, however, were too drastic to allow grade 12 results from before and after implementation to be directly compared. These changes included adding more questions on algebra, data analysis, and probability to reflect changes in high school mathematics standards and coursework; merging the measurement and geometry content areas; and changing the reporting scale from 0–500 to 0–300. For more information regarding the 2005 mathematics framework revisions, see http://nces.ed.gov/nationsreportcard/mathematics/frameworkcomparison.asp.

Results are available for the reading assessments administered in 2000, 2002, 2003, 2005, 2007, 2009, 2011, 2013, and 2015. In 2009, a new framework was developed for the 4th-, 8th-, and 12th-grade NAEP reading assessments.

Both a content alignment study and a reading trend, or bridge, study were conducted to determine if the new reading assessment was comparable to the prior assessment. Overall, the results of the special analyses

suggested that the assessments were similar in terms of their item and scale characteristics and the results they produced for important demographic groups of students. Thus, it was determined that the results of the 2009 reading assessment could still be compared to those from earlier assessment years, thereby maintaining the trend lines first established in 1992. For more information regarding the 2009 reading framework revisions, see http://nces.ed.gov/nationsreportcard/reading/whatmeasure.asp.

In 2014, the first administration of the NAEP Technology and Engineering Literacy (TEL) Assessment asked 8th-graders to respond to questions aimed at assessing their knowledge and skill in understanding technological principles, solving technology and engineering-related problems, and using technology to communicate and collaborate. The online report *The Nation's Report Card: Technology and Engineering Literacy* (NCES 2016-119) presents national results for 8th-graders on the TEL assessment.

The Nation's Report Card: 2015 Mathematics and Reading Assessments (NCES 2015-136) is an online interactive report that presents national and state results for 4th- and 8th-graders on the NAEP 2015 mathematics and reading assessments. The report also presents TUDA results in mathematics and reading for 4th- and 8th-graders. The online interactive report *The Nation's Report Card: 2015 Mathematics and Reading at Grade 12* (NCES 2016-018) presents grade 12 results from the NAEP 2015 mathematics and reading assessments.

Results from the 2015 NAEP science assessment are presented in the online report *The Nation's Report Card: 2015 Science at Grades 4, 8, and 12* (NCES 2016-162). The assessment measures 4th-, 8th-, and 12th-graders' knowledge in three science content areas (physical science, life science, and Earth and space sciences) and their understanding of four science practices (identifying science principles, using science principles, using scientific inquiry, and using technological design). National results are reported for grades 4, 8, and 12, and results from 46 participating states and 1 jurisdiction are reported for grades 4 and 8. Since a new NAEP science framework was introduced in 2009, results from the 2015 science assessment can be compared to results from the 2009 and 2011 science assessments, but cannot be compared to the science assessments conducted prior to 2009.

NAEP is in the process of transitioning from paper-based assessments to technology-based assessments; consequently, data are needed regarding students' access to and familiarity with technology, at home and at school. The Computer Access and Familiarity Study (CAFS) is designed to fulfill this need. CAFS was conducted as part of the main administration of the 2015 NAEP. A subset of the grade 4, 8, and 12 students who took the main NAEP were chosen to take the additional CAFS questionnaire. The main 2015 NAEP was administered in a paper-and-pencil format to some students and a digital-based format to others; CAFS participants were given questionnaires in the same format as their NAEP questionnaires.

Further information on NAEP may be obtained from:

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http://nces.ed.gov/nationsreportcard

For the 2015 National Assessment of Educational Progress (NAEP) questionnaire, please see: https://nces.ed.gov/nationsreportcard/bgquest.aspx and https://www.nationsreportcard.gov/sample_questions.aspx.

For the 2015 Computer Access and Familiarity Study (CAFS) questionnaire, please see: https://nces.ed.gov/nationsreportcard/subject/field_pubs/sqb/pdf/2015_sq_computer_access_familiarity.pdf.

Census Bureau

American Community Survey

The Census Bureau introduced the American Community Survey (ACS) in 1996. Fully implemented in 2005, it provides a large monthly sample of demographic, socioeconomic, and housing data comparable in content to the Long Forms of the Decennial Census up to and including the 2000 long form. Aggregated over time, these data serve as a replacement for the Long Form of the Decennial Census. The survey includes questions mandated by federal law, federal regulations, and court decisions.

Since 2011, the survey has been mailed to approximately 295,000 addresses in the United States and Puerto Rico each month, or about 3.5 million addresses annually. A larger proportion of addresses in small governmental units (e.g., American Indian reservations,

small counties, and towns) also receive the survey. The monthly sample size is designed to approximate the ratio used in the 2000 Census, which requires more intensive distribution in these areas. The ACS covers the U.S. resident population, which includes the entire civilian, noninstitutionalized population; incarcerated persons; institutionalized persons; and the active duty military who are in the United States. In 2006, the ACS began interviewing residents in group quarter facilities. Institutionalized group quarters include adult and juvenile correctional facilities, nursing facilities, and other health care facilities. Noninstitutionalized group quarters include college and university housing, military barracks, and other noninstitutional facilities such as workers and religious group quarters and temporary shelters for the homeless.

National-level data from the ACS are available from 2000 onward. The ACS produces 1-year estimates for jurisdictions with populations of 65,000 and over and 5-year estimates for jurisdictions with smaller populations. The 1-year estimates for 2015 used data collected between January 1, 2015, and December 31, 2015, and the 5-year estimates for 2011–2015 used data collected between January 1, 2011, and December 31, 2015. The ACS produced 3-year estimates (for jurisdictions with populations of 20,000 or over) for the periods 2005–2007, 2006–2008, 2007–2009, 2008–2010, 2009–2011, 2010–2012, and 2011–2013. Three-year estimates for these periods will continue to be available to data users, but no further 3-year estimates will be produced.

Further information about the ACS is available at https://www.census.gov/programs-surveys/acs/.

For the 2015 American Community Survey (ACS) questionnaire, please see: https://www.census.gov/programs-surveys/acs/methodology/questionnaire-archive.html.

Current Population Survey

The Current Population Survey (CPS) is a monthly survey of about 60,000 households conducted by the U.S. Census Bureau for the Bureau of Labor Statistics. The CPS is the primary source of information of labor force statistics for the U.S. noninstitutionalized population (e.g., it excludes military personnel and their families living on bases and inmates of correctional institutions). In addition, supplemental questionnaires are used to provide further information about the U.S. population. The March supplement presents detailed questions regarding income. The October supplement presents detailed questions regarding school enrollment and school characteristics; in some years, this supplement has also contained additional questions about computer and internet use. In the July supplement, questions about computer and internet use are the principal focus.

The current sample design, introduced in July 2001, includes about 72,000 households. Each month about 58,900 of the 72,000 households are eligible for interview, and of those, 7 to 10 percent are not interviewed because of temporary absence or unavailability. Information is obtained each month from those in the household who are 15 years of age and older, and demographic data are collected for children 0–14 years of age. In addition, supplemental questions regarding school enrollment are asked about eligible household members ages 3 and older in the October survey. Prior to July 2001, data were collected in the CPS from about 50,000 dwelling units. The samples are initially selected based on the decennial census files and are periodically updated to reflect new housing construction.

A major redesign of the CPS was implemented in January 1994 to improve the quality of the data collected. Survey questions were revised, new questions were added, and computer-assisted interviewing methods were used for the survey data collection. Further information about the redesign is available in *Current Population Survey, October 1995: (School Enrollment Supplement) Technical Documentation* at http://www.census.gov/prod/techdoc/cps/cpsoct95.pdf.

Caution should be used when comparing data from 1994 through 2001 with data from 1993 and earlier. Data from 1994 through 2001 reflect 1990 census-based population controls, while data from 1993 and earlier reflect 1980 or earlier census-based population controls. Changes in population controls generally have relatively little impact on summary measures such as means, medians, and percentage distributions. They can have a significant impact on population counts. For example, use of the 1990 census-based population controls resulted in about a 1 percent increase in the civilian noninstitutional population and in the number of families and households. Thus, estimates of levels for data collected in 1994 and later years will differ from those for earlier years by more than what could be attributed to actual changes in the population. These differences could be disproportionately greater for certain subpopulation groups than for the total population.

Beginning in 2003, the race/ethnicity questions were expanded. Information on people of Two or more races was included, and the Asian and Pacific Islander race category was split into two categories—Asian and Native Hawaiian or Other Pacific Islander. In addition, questions were reworded to make it clear that self-reported data on race/ethnicity should reflect the race/ethnicity with which the responder identifies, rather than what may be written in official documentation.

The estimation procedure employed for monthly CPS data involves inflating weighted sample results to independent estimates of characteristics of the civilian noninstitutional population in the United States by age, sex, and race. These independent estimates are based on statistics from decennial censuses; statistics on births, deaths, immigration, and emigration; and statistics on the population in the armed services. Generalized standard error tables are provided in the Current Population Reports; methods for deriving standard errors can be found within the CPS technical documentation at http://www.census.gov/programs-surveys/cps/technical-documentation/complete.html. The CPS data are subject to both nonsampling and sampling errors.

Prior to 2009, standard errors were estimated using the generalized variance function. The generalized variance function is a simple model that expresses the variance as a function of the expected value of a survey estimate. Beginning with March 2009 CPS data, standard errors were estimated using replicate weight methodology. Those interested in using CPS household-level supplement replicate weights to calculate variances may refer to *Estimating Current Population Survey (CPS) Household-Level Supplement Variances Using Replicate Weights* at http://thedataweb.rm.census.gov/pub/cps/supps/HH-level_Use_of_the_Public_Use_Replicate_Weight_File.doc.

Further information on the CPS may be obtained from:

Education and Social Stratification Branch
Population Division
Census Bureau
U.S. Department of Commerce
4600 Silver Hill Road
Washington, DC 20233
https://www.census.gov/programs-surveys/cps.html

School Enrollment

Each October, the Current Population Survey (CPS) includes supplemental questions on the enrollment status of the population ages 3 years and over. Prior to 2001, the October supplement consisted of approximately 47,000 interviewed households. Beginning with the October 2001 supplement, the sample was expanded by 9,000 to a total of approximately 56,000 interviewed households. The main sources of nonsampling variability in the responses to the supplement are those inherent in the survey instrument. The question of current enrollment may not be answered accurately for various reasons. Some respondents may not know current grade information for every student in the household, a problem especially prevalent for households with members in college or in nursery school. Confusion over college credits or hours taken by a student may make it difficult to determine the year in which the student is enrolled. Problems may occur with the definition of nursery school (a group or class organized to provide educational experiences for children) where respondents' interpretations of "educational experiences" vary.

For the October 2015 basic CPS, the household-level nonresponse rate was 12.9 percent. The person-level nonresponse rate for the school enrollment supplement was an additional 8.9 percent. Since the basic CPS nonresponse rate is a household-level rate and the school enrollment supplement nonresponse rate is a person-level rate, these rates cannot be combined to derive an overall nonresponse rate. Nonresponding households may have fewer persons than interviewed ones, so combining these rates may lead to an overestimate of the true overall nonresponse rate for persons for the school enrollment supplement.

Although the principal focus of the October supplement is school enrollment, in some years the supplement has included additional questions on other topics. In 2009, 2010, and 2012, for example, the October supplement included additional questions on computer and internet use.

Further information on the CPS School Enrollment Supplement may be obtained from:

Education and Social Stratification Branch
Census Bureau
U.S. Department of Commerce
4600 Silver Hill Road
Washington, DC 20233
https://www2.census.gov/programs-surveys/cps/techdocs/cpsoct15.pdf

For the 2012 CPS School Enrollment Supplement questionnaire, please see: https://www2.census.gov/programs-surveys/cps/techdocs/cpsoct12.pdf.

Computer and Internet Use

The Current Population Survey (CPS) has been conducting supplemental data collections regarding computer use since 1984. In 1997, these supplemental data collections were expanded to include data on internet access. More recently, data regarding computer and internet use were collected in October 2010, July 2011, October 2012, July 2013, and July 2015.

In the July 2011, 2013, and 2015 supplements, the sole focus was on computer and internet use. In the October 2010 and 2012 supplements questions on school enrollment were the principal focus, and questions on computer and internet use were less prominent. Measurable differences in estimates taken from these supplements across years could reflect actual changes in the population; however, differences could also reflect seasonal variations in data collection or differences between the content of the July and October supplements. Therefore, caution should be used when making year-to-year comparisons of CPS computer and internet use estimates.

The most recent computer and internet use supplement, conducted in July 2015, collected household information from all eligible CPS households, as well as person information from household members age 3 and over. Information was collected about the household's computer and internet use and the household member's use of the Internet from any location in the past year. Additionally, information was gathered regarding a randomly selected household respondent's use of the Internet.

For the July 2015 basic CPS, the household-level nonresponse rate was 13.0 percent. The person-level nonresponse rate for the computer and internet use supplement was an additional 23.0 percent. Since one rate is a person-level rate and the other a household-level rate, the rates cannot be combined to derive an overall rate.

Further information on the CPS Computer and Internet Use Supplement may be obtained from:

Education and Social Stratification Branch
Census Bureau
U.S. Department of Commerce
4600 Silver Hill Road
Washington, DC 20233
http://census.gov/topics/population/computer-internet.html

For the 2015 CPS Computer and Internet Use Supplement questionnaire, please see: https://www2.census.gov/programs-surveys/cps/techdocs/cpsjul15.pdf.

International Association for the Evaluation of Educational Achievement

The International Association for the Evaluation of Educational Achievement (IEA) is composed of governmental research centers and national research institutions around the world whose aim is to investigate education problems common among countries. Since its inception in 1958, the IEA has conducted more than 30 research studies of cross-national achievement. The regular cycle of studies encompasses learning in basic school subjects. Examples are the Trends in International Mathematics and Science Study (TIMSS) and the Progress in International Reading Literacy Study (PIRLS). IEA projects also include studies of particular interest to IEA members, such as the TIMSS 1999 Video Study of Mathematics and Science Teaching, the Civic Education Study, and studies on information technology in education.

The international bodies that coordinate international assessments vary in the labels they apply to participating education systems, most of which are countries. IEA differentiates between IEA members, which IEA refers to as "countries" in all cases, and "benchmarking participants." IEA members include countries such as the United States and Ireland, as well as subnational entities such as England and Scotland (which are both part of the United Kingdom), the Flemish community of Belgium, and Hong Kong (a Special Administrative Region of China). IEA benchmarking participants are all subnational entities and include Canadian provinces, U.S. states, and Dubai in the United Arab Emirates (among others). Benchmarking participants, like the participating countries, are given the opportunity to assess the comparative international standing of their students' achievement and to view their curriculum and instruction in an international context.

Some IEA studies, such as TIMSS and PIRLS, include an assessment portion, as well as contextual questionnaires for collecting information about students' home and school experiences. The TIMSS and PIRLS scales, including the scale averages and standard deviations, are designed to remain constant from assessment to assessment so that education systems (including countries and subnational education systems) can compare their scores over time as well as compare their scores directly with the scores of other education systems. Although each scale was created to have a mean of 500 and a standard deviation of 100, the subject matter and the level of difficulty of items necessarily differ by grade, subject,

and domain/dimension. Therefore, direct comparisons between scores across grades, subjects, and different domain/dimension types should not be made.

Further information on the International Association for the Evaluation of Educational Achievement may be obtained from http://www.iea.nl.

Trends in International Mathematics and Science Study

The Trends in International Mathematics and Science Study (TIMSS, formerly known as the Third International Mathematics and Science Study) provides data on the mathematics and science achievement of U.S. 4th- and 8th-graders compared with that of their peers in other countries. TIMSS collects information through mathematics and science assessments and questionnaires. The questionnaires request information to help provide a context for student performance. They focus on such topics as students' attitudes and beliefs about learning mathematics and science, what students do as part of their mathematics and science lessons, students' completion of homework, and their lives both in and outside of school; teachers' perceptions of their preparedness for teaching mathematics and science, teaching assignments, class size and organization, instructional content and practices, collaboration with other teachers, and participation in professional development activities; and principals' viewpoints on policy and budget responsibilities, curriculum and instruction issues, and student behavior. The questionnaires also elicit information on the organization of schools and courses. The assessments and questionnaires are designed to specifications in a guiding framework. The TIMSS framework describes the mathematics and science content to be assessed and provides grade-specific objectives, an overview of the assessment design, and guidelines for item development.

TIMSS is on a 4-year cycle. Data collections occurred in 1995, 1999 (8th grade only), 2003, 2007, 2011, and 2015. TIMSS 2015 consisted of five assessments: 4th-grade mathematics; numeracy (a less difficult version of 4th-grade mathematics, newly developed for 2015); 8th-grade mathematics; 4th-grade science; and 8th-grade science. In addition to the 4th- and 8th-grade assessments, the third administration of TIMSS Advanced since 1995 was conducted. TIMSS Advanced assessed final-year (12th-grade) secondary students' achievement in advanced mathematics and physics. The study also collected policy-relevant information about students, curriculum emphasis, technology use, and teacher preparation and training.

TIMSS Sampling and Response Rates

TIMSS 2015 was administered between March and May of 2015 in the United States. The U.S. sample was randomly selected and weighted to be representative of the nation. In order to reliably and accurately represent the performance of each country, international guidelines required that countries sample at least 150 schools and at least 4,000 students per grade (countries with small class sizes of fewer than 30 students per school were directed to consider sampling more schools, more classrooms per school, or both, to meet the minimum target of 4,000 tested students). In the United States, a total of 250 schools and 10,029 students participated in the grade 4 TIMSS survey, and 246 schools and 10,221 students participated in the grade 8 TIMSS (these figures do not include the participation of the state of Florida as a subnational education system, which was separate from and additional to its participation in the U.S. national sample).

TIMSS Advanced, also administered between March and May of 2015 in the United States, required participating countries and other education systems to draw probability samples of students in their final year of secondary school—ISCED Level 3—who were taking or had taken courses in advanced mathematics or who were taking or had taken courses in physics. International guidelines for TIMSS Advanced called for a minimum of 120 schools to be sampled, with a minimum of 3,600 students assessed per subject. In the United States, a total of 241 schools and 2,954 students participated in advanced mathematics, and 165 schools and 2,932 students participated in physics.

In TIMSS 2015, the weighted school response rate for the United States was 77 percent for grade 4 before the use of substitute schools (schools substituted for originally sampled schools that refused to participate) and 85 percent with the inclusion of substitute schools. For grade 8, the weighted school response rate before the use of substitute schools was 78 percent, and it was 84 percent with the inclusion of substitute schools. The weighted student response rate was 96 percent for grade 4 and 94 percent for grade 8.

In TIMSS Advanced 2015, the weighted school response rate for the United States for advanced mathematics was 72 percent before the use of substitute schools and 76 percent with the inclusion of substitute schools. The weighted school response rate for the United States for physics was 65 percent before the use of substitute schools and 68 percent with the inclusion of substitute schools.

The weighted student response rate was 87 percent for advanced mathematics and 85 percent for physics. Student response rates are based on a combined total of students from both sampled and substitute schools.

Further information on the TIMSS study may be obtained from:

Stephen Provasnik
International Assessment Branch
Assessments Division
National Center for Education Statistics
550 12th Street SW
Washington, DC 20202
(202) 245-6442
stephen.provasnik@ed.gov
http://nces.ed.gov/timss
http://www.iea.nl/timss

For the 2015 TIMSS questionnaire, please see: https://nces.ed.gov/timss/questionnaire.asp.

Organization for Economic Cooperation and Development

The Organization for Economic Cooperation and Development (OECD) publishes analyses of national policies and survey data in education, training, and economics in OECD and partner countries. Newer studies include student survey data on financial literacy and on digital literacy.

Program for International Student Assessment

The Program for International Student Assessment (PISA) is a system of international assessments organized by the Organization for Economic Cooperation and Development (OECD), an intergovernmental organization of industrialized countries, that focuses on 15-year-olds' capabilities in reading literacy, mathematics literacy, and science literacy. PISA also includes measures of general, or cross-curricular, competencies such as learning strategies. PISA emphasizes functional skills that students have acquired as they near the end of compulsory schooling.

PISA is a 2-hour exam. Assessment items include a combination of multiple-choice questions and open-ended questions that require students to develop their own response. PISA scores are reported on a scale that ranges from 0 to 1,000, with the OECD mean set at 500 and a standard deviation set at 100. In 2015, literacy in science, reading, and mathematics were assessed through a computer-based assessment in the majority of countries, including the United States. Education systems could also participate in optional pencil-and-paper financial literacy assessments and computer-based mathematics and reading assessments. In each education system, the assessment is translated into the primary language of instruction; in the United States, all materials are written in English.

Forty-three education systems participated in the 2000 PISA; 41 education systems participated in 2003; 57 (30 OECD member countries and 27 nonmember countries or education systems) participated in 2006; and 65 (34 OECD member countries and 31 nonmember countries or education systems) participated in 2009. (An additional nine education systems administered the 2009 PISA in 2010.) In PISA 2012, 65 education systems (34 OECD member countries and 31 nonmember countries or education systems), as well as the U.S. states of Connecticut, Florida, and Massachusetts, participated. In the 2015 PISA, 73 education systems (35 OECD member countries and 31 nonmember countries or education systems), as well as the states of Massachusetts and North Carolina and the territory of Puerto Rico, participated.

To implement PISA, each of the participating education systems scientifically draws a nationally representative sample of 15-year-olds, regardless of grade level. In the PISA 2015 national sample for the United States, about 5,700 students from 177 public and private schools were represented. Massachusetts, North Carolina, and Puerto Rico also participated in PISA 2015 as separate education systems. In Massachusetts, about 1,400 students from 48 public schools participated; in North Carolina, about 1,900 students from 54 public schools participated; and in Puerto Rico, about 1,400 students in 47 public and private schools participated.

The intent of PISA reporting is to provide an overall description of performance in reading literacy, mathematics literacy, and science literacy every 3 years, and to provide a more detailed look at each domain in the years when it is the major focus. These cycles will allow education systems to compare changes in trends for each of the three subject areas over time. In the first cycle, PISA 2000, reading literacy was the major focus, occupying roughly two-thirds of assessment time. For 2003, PISA focused on mathematics literacy as well as the ability of students to solve problems in real-life settings. In 2006, PISA focused on science literacy; in 2009, it focused on reading literacy again; and in 2012, it focused on mathematics literacy. PISA 2015 focused on science, as it did in 2006.

Further information on PISA may be obtained from:

Patrick Gonzales
International Assessment Branch
Assessments Division
National Center for Education Statistics
550 12th Street SW
Washington, DC 20202
patrick.gonzales@ed.gov
http://nces.ed.gov/surveys/pisa

For the 2015 PISA questionnaire, please see: https://nces.ed.gov/surveys/pisa/questionnaire.asp.

Program for the International Assessment of Adult Competencies

The Program for the International Assessment of Adult Competencies (PIAAC) is a cyclical, large-scale study that aims to assess and compare the broad range of basic skills and competencies of adults around the world. Developed under the auspices of the Organization for Economic Cooperation and Development (OECD), it is the most comprehensive international survey of adult skills ever undertaken. Adults were surveyed in 24 participating countries in 2012 and in an additional 9 countries in 2014.

PIAAC focuses on what are deemed basic cognitive and workplace skills necessary to adults' successful participation in 21st-century society and in the global economy. Skills assessed include literacy, numeracy, problem solving in technology-rich environments, and basic reading skills. PIAAC measures the relationships between these skills and other characteristics such as individuals' educational background, workplace experiences, and occupational attainment. PIAAC was administered on laptop computers or in paper-and-pencil mode. In the United States, the background questionnaire was administered in both English and Spanish, and the cognitive assessment was administered only in English.

The 2012 PIAAC assessment for the United States included a nationally representative probability sample of households. This household sample was selected on the basis of a four-stage, stratified area sample: (1) primary sampling units (PSUs) consisting of counties or groups of contiguous counties; (2) secondary sampling units (referred to as segments) consisting of area blocks; (3) housing units containing households; and (4) eligible persons within households. Person-level data were collected through a screener, a background questionnaire, and the assessment.

Based on the screener data, 6,100 U.S. respondents ages 16 to 65 were selected to complete the 2012 background questionnaire and the assessment; 4,898 actually completed the background questionnaire. Of the 1,202 respondents who did not complete the background questionnaire, 112 were unable to do so because of a literacy-related barrier: either the inability to communicate in English or Spanish or a mental disability. Twenty others were unable to complete the questionnaire due to technical problems. The final response rate for the background questionnaire—which included respondents who completed it and respondents who were unable to complete it because of a language problem or mental disability—was 82.2 percent weighted. The overall weighted response rate for the household sample—the product of the component response rates—was 70.3 percent.

The 2014 PIAAC supplement repeated the 2012 administration of PIAAC to an additional sample of U.S. adults in order to enhance the 2012 sample. It included a sample of participants from different households in the PSUs from the 2012 sample.

Key to PIAAC's value is its collaborative and international nature. In the United States, NCES has consulted extensively with the Department of Labor in the development of the survey, and staff from both agencies are co-representatives of the United States in PIAAC's international governing body. Internationally, PIAAC has been developed through the collaboration of OECD staff and participating countries' representatives from their ministries or departments of education and labor. Through this cooperative effort, all participating countries follow the quality assurance guidelines set by the OECD consortium and closely follow all agreed-upon standards set for survey design, assessment implementation, and reporting of results.

Further information on PIAAC may be obtained from:

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Assessments Division
National Center for Education Statistics
550 12th Street SW
Washington, DC 20202
holly.xie@ed.gov
https://nces.ed.gov/surveys/piaac/
http://www.oecd.org/skills/piaac/

For the 2015 PIAAC Background Questionnaire, please see: https://nces.ed.gov/surveys/piaac/bgquestionnaire.asp. For the 2015 PIAAC sample items, please see: https://nces.ed.gov/surveys/piaac/sample_lit.asp.

Appendix B: Definitions

A

Achievement gap Occurs when one group of students outperforms another group, and the difference in average scores for the two groups is statistically significant (that is, larger than the margin of error).

Achievement test An examination that measures the extent to which a person has acquired certain information or mastered certain skills, usually as a result of specific instruction.

Advanced Placement (AP) A program of tertiary-level courses and examinations, taught by specially qualified teachers, that provides opportunities for secondary school students to earn undergraduate credits for university courses. The schools and teachers offering AP programs must meet College Board requirements and are monitored by the College Board.

Associate's degree A degree granted for the successful completion of a sub-baccalaureate program of studies, usually requiring at least 2 years (or equivalent) of full-time college-level study. This includes degrees granted in a cooperative or work-study program.

B

Bachelor's degree A degree granted for the successful completion of a baccalaureate program of studies, usually requiring at least 4 years (or equivalent) of full-time college-level study. This includes degrees granted in a cooperative or work-study program.

C

Central cities The largest cities, with 50,000 or more inhabitants, in a metropolitan area. Additional cities within the metropolitan area can also be classified as "central cities" if they meet certain employment, population, and employment/residence ratio requirements. See also Metropolitan status.

City school See Locale codes.

Classroom teacher A staff member assigned the professional activities of instructing pupils in self-contained classes or courses, or in classroom situations; usually expressed in full-time equivalents.

Coefficient of variation (CV) Represents the ratio of the standard error to the estimate. For example, a CV of 30 percent indicates that the standard error of the estimate is equal to 30 percent of the estimate's value. The CV is used to compare the amount of variation relative to the magnitude of the estimate. A CV of 30 percent or greater indicates that an estimate should be interpreted with caution. For a discussion of standard errors, see the Reader's Guide.

Cohort A group of individuals who have a statistical factor in common, for example, year of birth.

College A postsecondary school that offers general or liberal arts education, usually leading to an associate's, bachelor's, master's, or doctor's degree. Junior colleges and community colleges are included under this terminology.

Computer science A group of instructional programs that describes computer and information sciences, including computer programming, data processing, and information systems.

Control of institutions A classification of institutions of elementary/secondary or postsecondary education by whether the institution (a) is operated by publicly elected or appointed officials and derives its primary support from public funds (public control) or (b) is operated by privately elected or appointed officials and derives its major source of funds from private sources (private control).

Current dollars Dollar amounts that have not been adjusted to compensate for inflation.

D

Degree An award conferred by a college, university, or other postsecondary education institution as official recognition for the successful completion of a program of studies. Refers specifically to associate's or higher degrees conferred by degree-granting institutions. See also Associate's degree, Bachelor's degree, Master's degree, and Doctor's degree.

Disabilities, children with Those children evaluated as having certain impairments and who, by reason thereof, receive special education and related services under the Individuals with Disabilities Education Act (IDEA) according to an Individualized Education Program (IEP), Individualized Family Service Plan (IFSP), or a services plan. There are local variations in the determination of disability conditions, and not all states use all reporting categories.

Doctor's degree The highest award a student can earn for graduate study. Includes such degrees as the Doctor of Education (Ed.D.); Doctor of Juridical Science (S.J.D.); Doctor of Public Health (Dr.P.H.); and Doctor of Philosophy (Ph.D.) in any field, such as agronomy, food technology, education, engineering, public administration, ophthalmology, or radiology.

E

Educational attainment The highest grade of regular school attended and completed.

Elementary education/programs Learning experiences concerned with the knowledge, skills, appreciations, attitudes, and behavioral characteristics that are considered to be needed by all pupils in terms of their awareness of life within our culture and the world of work, and that normally may be achieved during the elementary school years (usually kindergarten through grade 8 or kindergarten through grade 6), as defined by applicable state laws and regulations.

Elementary school A school classified as elementary by state and local practice and composed of any span of grades not above grade 8.

Elementary/secondary school Includes only schools that are part of state and local school systems, and also most nonprofit private elementary/secondary schools, both religiously affiliated and nonsectarian. Includes regular, alternative, vocational, and special education schools. U.S. totals exclude federal schools for American Indians, and federal schools on military posts and other federal installations.

Engineering Instructional programs that describe the mathematical and natural science knowledge gained by study, experience, and practice and applied with judgment to develop ways to utilize the materials and forces of nature economically. Includes programs that prepare individuals to support and assist engineers and similar professionals.

English language learner (ELL) An individual who, due to any of the reasons listed below, has sufficient difficulty speaking, reading, writing, or understanding the English language to be denied the opportunity to learn successfully in classrooms where the language of instruction is English or to participate fully in the larger U.S. society. Such an individual (1) was not born in the United States or has a native language other than English; (2) comes from environments where a language other than English is dominant; or (3) is an American Indian or Alaska Native and comes from environments where a language other than English has had a significant impact on the individual's level of English language proficiency.

Enrollment The total number of students registered in a given school unit at a given time, generally in the fall

of a year. At the postsecondary level, separate counts are also available for full-time and part-time students, as well as full-time-equivalent enrollment.

Estimate A numerical value obtained from a statistical sample and assigned to a population parameter. The particular value yielded by an estimator in a given set of circumstances or the rule by which such particular values are calculated.

Estimation Estimation is concerned with inference about the numerical value of unknown population values from incomplete data, such as a sample. If a single figure is calculated for each unknown parameter, the process is called point estimation. If an interval is calculated within which the parameter is likely, in some sense, to lie, the process is called interval estimation.

F

Family A group of two or more people (one of whom is the householder) related by birth, marriage, or adoption and residing together. All such people (including related subfamily members) are considered as members of one family.

Family income Includes all monetary income from all sources (including jobs, businesses, interest, rent, and Social Security payments) over a 12-month period. The income of nonrelatives living in the household is excluded, but the income of all family members age 15 or older (age 14 or older in years prior to 1989), including those temporarily living outside of the household, is included. In the October Current Population Survey, family income is determined from a single question asked of the household respondent.

Federal funds Amounts collected and used by the federal government for the general purposes of the government. The major federal fund is the general fund, which is derived from general taxes and borrowing. Other types of federal fund accounts include special funds (earmarked for a specific purpose other than a business-like activity), public enterprise funds (earmarked for a business-like activity conducted primarily with the public), and intragovernmental funds (earmarked for a business-like activity conducted primarily within the government).

Free or reduced-price lunch See National School Lunch Program.

G

Group quarters Living arrangements where people live or stay in a group situation that is owned or managed by an entity or organization providing housing and/or services for the residents. Group quarters include such places as college residence halls, residential treatment centers, skilled nursing facilities, group homes, military barracks, correctional facilities, and workers' dormitories.

> **Institutionalized group quarters** Include adult and juvenile correctional facilities, nursing facilities, and other health care facilities.
>
> **Noninstitutionalized group quarters** Include college and university housing, military quarters, facilities for workers and religious groups, and temporary shelters for the homeless.

H

Handicapped See Disabilities, children with.

High school A secondary school offering the final years of high school work necessary for graduation. A high school is usually either a 3-year school that includes grades 10, 11, and 12 or a 4-year school that includes grades 9, 10, 11, and 12.

High school diploma A formal document regulated by the state certifying the successful completion of a prescribed secondary school program of studies. In some states or communities, high school diplomas are differentiated by type, such as an academic diploma, a general diploma, or a vocational diploma.

High school program A program of studies designed to prepare students for employment and postsecondary education. Three types of programs are often distinguished—academic, vocational, and general. An academic program is designed to prepare students for continued study at a college or university. A vocational program is designed to prepare students for employment in one or more semiskilled, skilled, or technical occupations. A general program is designed to provide students with the understanding and competence to function effectively in a free society and usually represents a mixture of academic and vocational components.

Household All the people who occupy a housing unit. A house, an apartment, a mobile home, a group of rooms, or a single room is regarded as a housing unit when it is occupied or intended for occupancy as separate living quarters, that is, when the occupants do not live and eat with any other people in the structure, and there is direct access from the outside or through a common hall.

Housing unit A house, an apartment, a mobile home, a group of rooms, or a single room that is occupied as separate living quarters.

I

Instruction (elementary and secondary) Instruction encompasses all activities dealing directly with the interaction between teachers and students. Teaching may be provided for students in a school classroom, in another location such as a home or hospital, and in other learning situations such as those involving co-curricular activities. Instruction may be provided through some other approved medium, such as the Internet, television, radio, telephone, and correspondence.

L

Level of school A classification of elementary/secondary schools by instructional level. Includes elementary schools, secondary schools, and combined elementary and secondary schools. See also Elementary school and Secondary school.

Limited-English proficient Refers to an individual who was not born in the United States and whose native language is a language other than English, or who comes from an environment where a language other than English has had a significant impact on the individual's level of English language proficiency. It may also refer to an individual who is migratory, whose native language is a language other than English, and who comes from an environment where a language other than English is dominant; and whose difficulties in speaking, reading, writing, or understanding the English language may be sufficient to deny the individual the ability to meet the state's proficient level of achievement on state assessments as specified under the No Child Left Behind Act, the ability to successfully achieve in classrooms where the language of instruction is English, or the opportunity to participate fully in society. See also English language learner.

Local education agency (LEA) See School district.

Locale codes A classification system to describe a type of location. The "Metro-Centric" locale codes, developed in the 1980s, classified all schools and school districts based on their county's proximity to a Metropolitan Statistical Area (MSA) and their specific location's population size and density. In 2006, the "Urban-Centric" locale codes were introduced. These locale codes are based on an address's proximity to an urbanized area. For more information see https://nces.ed.gov/surveys/ruraled/definitions.asp.

Pre-2006 Metro-Centric Locale Codes

Large City: A central city of a consolidated metropolitan statistical area (CMSA) or MSA, with the city having a population greater than or equal to 250,000.

Mid-size City: A central city of a CMSA or MSA, with the city having a population less than 250,000.

Urban Fringe of a Large City: Any territory within a CMSA or MSA of a Large City and defined as urban by the Census Bureau.

Urban Fringe of a Mid-size City: Any territory within a CMSA or MSA of a Mid-size City and defined as urban by the Census Bureau.

Large Town: An incorporated place or Census-designated place with a population greater than or equal to 25,000 and located outside a CMSA or MSA.

Small Town: An incorporated place or Census-designated place with a population less than 25,000 and greater than or equal to 2,500 and located outside a CMSA or MSA.

Rural, Outside MSA: Any territory designated as rural by the Census Bureau that is outside a CMSA or MSA of a Large or Mid-size City.

Rural, Inside MSA: Any territory designated as rural by the Census Bureau that is within a CMSA or MSA of a Large or Mid-size City.

2006 Urban-Centric Locale Codes

City, Large: Territory inside an urbanized area and inside a principal city with population of 250,000 or more.

City, Midsize: Territory inside an urbanized area and inside a principal city with population less than 250,000 and greater than or equal to 100,000.

City, Small: Territory inside an urbanized area and inside a principal city with population less than 100,000.

Suburb, Large: Territory outside a principal city and inside an urbanized area with population of 250,000 or more.

Suburb, Midsize: Territory outside a principal city and inside an urbanized area with population less than 250,000 and greater than or equal to 100,000.

Suburb, Small: Territory outside a principal city and inside an urbanized area with population less than 100,000.

Town, Fringe: Territory inside an urban cluster that is less than or equal to 10 miles from an urbanized area.

Town, Distant: Territory inside an urban cluster that is more than 10 miles and less than or equal to 35 miles from an urbanized area.

Town, Remote: Territory inside an urban cluster that is more than 35 miles from an urbanized area.

Rural, Fringe: Census-defined rural territory that is less than or equal to 5 miles from an urbanized area, as well as rural territory that is less than or equal to 2.5 miles from an urban cluster.

Rural, Distant: Census-defined rural territory that is more than 5 miles but less than or equal to 25 miles from an urbanized area, as well as rural territory that is more than 2.5 miles but less than or equal to 10 miles from an urban cluster.

Rural, Remote: Census-defined rural territory that is more than 25 miles from an urbanized area and is also more than 10 miles from an urban cluster.

M

Margin of error The range of potential true or actual values for a sample survey estimate. The margin of error depends on several factors such as the amount of variation in the responses, the size and representativeness of the sample, and the size of the subgroup for which the estimate is computed. The magnitude of the margin of error is represented by the standard error of the estimate.

Master's degree A degree awarded for successful completion of a program generally requiring 1 or 2 years of full-time college-level study beyond the bachelor's degree. One type of master's degree, including the Master of Arts degree, or M.A., and the Master of Science degree, or M.S., is awarded in the liberal arts and sciences for advanced scholarship in a subject field or discipline and demonstrated ability to perform scholarly research. A second type of master's degree is awarded for the completion of a professionally oriented program, for example, an M.Ed. in education, an M.B.A. in business administration, an M.F.A. in fine arts, an M.M. in music, an M.S.W. in social work, and an M.P.A. in public administration. Some master's degrees—such as divinity degrees (M.Div. or M.H.L./Rav), which were formerly classified as "first-professional"—may require more than 2 years of full-time study beyond the bachelor's degree.

Mathematics A group of instructional programs that describes the science of numbers and their operations, interrelations, combinations, generalizations, and abstractions and of space configurations and their structure, measurement, transformations, and generalizations.

Mean test score The score obtained by dividing the sum of the scores of all individuals in a group by the number of individuals in that group for which scores are available.

Metropolitan status A metropolitan area (MA) must contain either a place with a minimum population of 50,000 or a Census Bureau-defined urbanized area and a total MA population of at least 100,000 (75,000 in New England). An MA is comprised of one or more central counties, and may also include one or more outlying counties that have closed economic and social relationships with the central county. An outlying county must have a specified level of commuting to the central counties and also must meet certain standards regarding metropolitan character, such as population density, urban population, and population growth. In New England, MAs are composed of cities and towns rather than whole counties. Areas not meeting these criteria are considered nonmetropolitan. See also Central cities.

Middle school A school with no grade lower than 5 and no grade higher than 8.

N

National Assessment of Educational Progress (NAEP) See Appendix A: Guide to Data Sources for Indicators.

National School Lunch Program Established by President Truman in 1946, the program is a federally assisted meal program operated in public and private nonprofit schools and residential child care centers. To be eligible for free lunch, a student must be from a household with an income at or below 130 percent of the federal poverty guideline; to be eligible for reduced-price lunch, a student must be from a household with an income between 130 percent and 185 percent of the federal poverty guideline.

Nursery school An instructional program for groups of children during the year or years preceding kindergarten, which provides educational experiences under the direction of teachers.

O

Occupied housing unit Separate living quarters with occupants currently inhabiting the unit. See also Housing unit.

Organization for Economic Cooperation and Development (OECD) An intergovernmental organization of industrialized countries that serves as a forum for member countries to cooperate in research and policy development on social and economic topics of common interest. In addition to member countries, partner countries contribute to the OECD's work in a sustained and comprehensive manner.

P

Postsecondary education The provision of formal instructional programs with a curriculum designed primarily for students who have completed the requirements for a high school diploma or equivalent. This includes programs of an academic, vocational, and continuing professional education purpose, and excludes avocational and adult basic education programs.

Poverty (official measure) The U.S. Census Bureau uses a set of money income thresholds that vary by family size and composition. A family, along with each individual in it, is considered poor if the family's total income is less than that family's threshold. The poverty thresholds do not vary geographically and are adjusted annually for inflation using the Consumer Price Index. The official poverty definition counts money income before taxes and does not include capital gains and noncash benefits (such as public housing, Medicaid, and food stamps).

Private school Private elementary/secondary schools surveyed by the Private School Universe Survey (PSS) are assigned to one of three major categories: Catholic schools (which are subdivided according to governance into parochial, diocesan, and private schools); other religious schools (which are subdivided according to religious affiliation into Conservative Christian, other affiliated, and unaffiliated schools); and nonsectarian schools (which are subdivided according to program emphasis into regular, special emphasis, and special education schools).

Program for International Student Assessment (PISA) See Appendix A: Guide to Data Sources for Indicators.

Public school or institution A school or institution controlled and operated by publicly elected or appointed officials and deriving its primary support from public funds.

R

Racial/ethnic group Classification indicating general racial or ethnic heritage. Race/ethnicity data are based on the *Hispanic* ethnic category and the race categories listed below (five single-race categories, plus the *Two or more races* category). Race categories exclude persons of Hispanic ethnicity unless otherwise noted.

> **White** A person having origins in any of the original peoples of Europe, the Middle East, or North Africa.
>
> **Black or African American** A person having origins in any of the black racial groups of Africa. Used interchangeably with the shortened term *Black*.
>
> **Hispanic or Latino** A person of Cuban, Mexican, Puerto Rican, South or Central American, or other Spanish culture or origin, regardless of race. Used interchangeably with the shortened term *Hispanic*.
>
> **Asian** A person having origins in any of the original peoples of the Far East, Southeast Asia, or the Indian subcontinent, including,

for example, Cambodia, China, India, Japan, Korea, Malaysia, Pakistan, the Philippine Islands, Thailand, and Vietnam. Prior to 2010–11, the Common Core of Data (CCD) combined Asian and Pacific Islander categories.

Native Hawaiian or Other Pacific Islander A person having origins in any of the original peoples of Hawaii, Guam, Samoa, or other Pacific Islands. Prior to 2010–11, the Common Core of Data (CCD) combined Asian and Pacific Islander categories. Used interchangeably with the shortened term *Pacific Islander*.

American Indian or Alaska Native A person having origins in any of the original peoples of North and South America (including Central America), and who maintains tribal affiliation or community attachment.

Two or more races A person identifying himself or herself as of two or more of the following race groups: White, Black, Asian, Native Hawaiian or Other Pacific Islander, or American Indian or Alaska Native. Some, but not all, reporting districts use this category. "Two or more races" was introduced in the 2000 Census and became a regular category for data collection in the Current Population Survey in 2003. The category is sometimes excluded from a historical series of data with constant categories. It is sometimes included within the category "Other."

Related children Related children in a family include own children and all other children in the household who are related to the householder by birth, marriage, or adoption.

Resident population Includes civilian population and armed forces personnel residing within the United States; excludes armed forces personnel residing overseas.

Rural school See Locale codes.

S

School A division of the school system consisting of students in one or more grades or other identifiable groups and organized to give instruction of a defined type. One school may share a building with another school or one school may be housed in several buildings. Excludes schools that have closed or are planned for the future.

School district An education agency at the local level that exists primarily to operate public schools or to contract for public school services. Synonyms are "local basic administrative unit" and "local education agency."

Science The body of related courses concerned with knowledge of the physical and biological world and with the processes of discovering and validating this knowledge.

Secondary enrollment The total number of students registered in a school beginning with the next grade following an elementary or middle school (usually 7, 8, or 9) and ending with or below grade 12 at a given time.

Secondary instructional level The general level of instruction provided for pupils in secondary schools (generally covering grades 7 through 12 or 9 through 12) and any instruction of a comparable nature and difficulty provided for adults and youth beyond the age of compulsory school attendance.

Secondary school A school comprising any span of grades beginning with the next grade following an elementary or middle school (usually 7, 8, or 9) and ending with or below grade 12. Both junior high schools and senior high schools are included.

Socioeconomic status (SES) The SES index is a composite of often equally weighted, standardized components, such as father's education, mother's education, family income, father's occupation, and household items. The terms high, middle, and low SES refer to ranges of the weighted SES composite index distribution.

Standard error of estimate An expression for the standard deviation of the observed values about a regression line. An estimate of the variation likely to be encountered in making predictions from the regression equation.

Standardized test A test composed of a systematic sampling of behavior, administered and scored according to specific instructions, capable of being interpreted in terms of adequate norms, and for which there are data on reliability and validity.

Standardized test performance The weighted distributions of composite scores from standardized tests used to group students according to performance.

STEM fields Science, Technology, Engineering, and Mathematics (STEM) fields of study that are considered to be of particular relevance to advanced societies.

Student An individual for whom instruction is provided in an educational program under the jurisdiction of a school, school system, or other education institution. No distinction is made between the terms "student" and "pupil," though "student" may refer to one receiving instruction at any level while "pupil" refers only to one attending school at the elementary or secondary level. A student may receive instruction in a school facility or in another location, such as at home or in a hospital. Instruction may be provided by direct student-teacher interaction or by some other approved medium such as television, radio, telephone, and correspondence.

T

Town school See Locale codes.

Type of school A classification of public elementary and secondary schools that includes the following categories: regular schools, special education schools, vocational schools, and alternative schools.

U

Unadjusted dollars See Current dollars.

Urban fringe school See Locale codes.

V

Variable A quantity that may assume any one of a set of values.

Appendix C: Reference Tables

Table 1.1. Percentage of children ages 3 to 18 living in households with a computer, by type of computer and selected child and family characteristics: Selected years, 2010 through 2015

Selected child or family characteristic	2010						2013						2015					
	Total, any computer or smart phone[1,2]		Desktop, laptop, netbook, or notebook computer[1]		Handheld computer or smart mobile phone		Total, any computer or smart phone[1,2]		Desktop, laptop, netbook, or notebook computer[1]		Handheld computer or smart mobile phone		Total, any computer or smart phone[1,2]		Desktop, laptop, netbook, or notebook computer[1]		Handheld computer or smart mobile phone	
1	2		3		4		5		6		7		8		9		10	
Total	**85.3**	**(0.37)**	**83.2**	**(0.38)**	**25.3**	**(0.48)**	**92.6**	**(0.08)**	**86.3**	**(0.11)**	**80.0**	**(0.11)**	**94.5**	**(0.06)**	**85.1**	**(0.12)**	**88.8**	**(0.08)**
Sex																		
Male	85.0	(0.44)	82.9	(0.45)	25.3	(0.57)	92.5	(0.08)	86.1	(0.12)	79.9	(0.13)	94.4	(0.07)	85.0	(0.13)	88.6	(0.09)
Female	85.5	(0.45)	83.4	(0.46)	25.3	(0.53)	92.6	(0.10)	86.4	(0.13)	80.2	(0.13)	94.5	(0.07)	85.2	(0.13)	88.9	(0.10)
Race/ethnicity																		
White	92.4	(0.34)	90.5	(0.38)	29.9	(0.71)	95.9	(0.07)	92.1	(0.11)	85.1	(0.11)	97.0	(0.06)	91.4	(0.11)	92.2	(0.09)
Black	72.8	(1.30)	70.3	(1.34)	17.6	(1.02)	87.1	(0.25)	76.2	(0.33)	72.7	(0.31)	90.2	(0.21)	74.5	(0.32)	83.0	(0.25)
Hispanic	74.3	(0.90)	72.0	(0.88)	17.0	(0.82)	87.2	(0.20)	77.3	(0.25)	71.5	(0.30)	90.7	(0.16)	75.4	(0.27)	83.5	(0.22)
Asian	93.5	(1.18)	93.1	(1.21)	28.5	(1.98)	97.9	(0.13)	96.4	(0.18)	86.3	(0.34)	98.3	(0.14)	95.9	(0.21)	93.3	(0.28)
Pacific Islander	83.9	(7.10)	78.9	(7.35)	24.4 !	(7.88)	87.8	(2.10)	79.9	(2.40)	70.4	(2.72)	90.9	(1.55)	80.5	(1.96)	83.8	(1.88)
American Indian/Alaska Native	72.4	(4.70)	66.2	(5.27)	21.4	(4.26)	79.0	(0.73)	70.3	(0.81)	62.7	(0.93)	83.7	(0.82)	68.8	(1.07)	75.9	(0.95)
Two or more races	85.2	(2.09)	82.0	(2.30)	33.9	(2.41)	95.8	(0.19)	89.9	(0.36)	85.7	(0.37)	97.1	(0.18)	88.6	(0.38)	93.0	(0.25)
Age																		
3 and 4	81.0	(0.76)	78.2	(0.78)	24.9	(0.80)	90.4	(0.15)	81.3	(0.22)	79.0	(0.21)	93.1	(0.15)	80.8	(0.24)	88.1	(0.18)
5 to 10	83.9	(0.52)	81.7	(0.52)	25.5	(0.61)	91.8	(0.09)	84.7	(0.13)	79.6	(0.15)	93.8	(0.09)	83.1	(0.14)	88.3	(0.12)
11 to 14	87.3	(0.59)	85.5	(0.62)	25.6	(0.73)	93.5	(0.10)	88.2	(0.13)	80.5	(0.14)	95.1	(0.08)	86.9	(0.14)	89.2	(0.11)
15 to 18	87.7	(0.49)	85.6	(0.54)	24.7	(0.71)	93.9	(0.10)	89.1	(0.14)	80.7	(0.14)	95.4	(0.08)	88.4	(0.14)	89.4	(0.11)
Metropolitan status[3]																		
Metropolitan[4]	85.7	(0.40)	83.6	(0.41)	26.5	(0.56)	—	(†)	—	(†)	—	(†)	—	(†)	—	(†)	—	(†)
Nonmetropolitan[5]	82.8	(0.94)	80.6	(0.98)	18.2	(1.05)	—	(†)	—	(†)	—	(†)	—	(†)	—	(†)	—	(†)
Highest level of education attained by either parent[6]																		
Less than high school	57.0	(1.77)	52.6	(1.70)	10.1	(0.94)	75.7	(0.40)	61.2	(0.39)	55.9	(0.42)	81.3	(0.35)	57.7	(0.41)	72.1	(0.37)
High school diploma or equivalent	76.1	(0.91)	73.4	(0.89)	15.5	(0.77)	87.3	(0.22)	76.2	(0.26)	69.9	(0.27)	90.2	(0.18)	73.5	(0.28)	82.1	(0.23)
Some college	88.7	(0.73)	86.4	(0.86)	23.2	(0.95)	94.3	(0.13)	87.1	(0.19)	81.3	(0.19)	95.8	(0.12)	85.2	(0.22)	90.0	(0.14)
Associate's degree	91.5	(0.67)	90.0	(0.79)	24.3	(1.37)	96.7	(0.14)	92.7	(0.21)	85.5	(0.25)	97.7	(0.12)	91.8	(0.23)	92.7	(0.24)
Bachelor's or higher degree	96.8	(0.28)	95.7	(0.34)	38.0	(0.87)	99.0	(0.04)	97.6	(0.06)	91.8	(0.10)	99.2	(0.03)	97.4	(0.06)	96.1	(0.08)
Bachelor's degree	95.9	(0.40)	94.8	(0.47)	36.8	(1.14)	98.6	(0.06)	96.9	(0.10)	90.5	(0.15)	99.0	(0.05)	96.6	(0.09)	95.4	(0.11)
Master's or higher degree	98.0	(0.35)	96.9	(0.44)	39.7	(1.16)	99.4	(0.04)	98.6	(0.07)	93.5	(0.14)	99.5	(0.04)	98.4	(0.07)	96.9	(0.10)
Family income (in current dollars)																		
Less than $10,000	53.9	(1.90)	50.0	(1.88)	9.8	(1.07)	76.4	(0.40)	61.5	(0.43)	58.6	(0.46)	82.1	(0.42)	58.1	(0.47)	73.6	(0.45)
$10,000 to $19,999	68.4	(1.35)	64.8	(1.44)	12.2	(1.06)	81.2	(0.34)	67.5	(0.43)	62.4	(0.40)	85.7	(0.31)	63.3	(0.43)	76.7	(0.32)
$20,000 to $29,999	75.4	(1.34)	72.5	(1.33)	14.8	(1.01)	86.9	(0.32)	74.7	(0.39)	68.1	(0.36)	89.2	(0.29)	71.3	(0.45)	80.4	(0.35)
$30,000 to $39,999	84.9	(1.05)	82.7	(1.13)	16.2	(0.95)	90.6	(0.22)	82.0	(0.27)	73.3	(0.37)	92.8	(0.22)	79.3	(0.36)	85.0	(0.30)
$40,000 to $49,999	91.1	(0.98)	88.9	(1.04)	23.3	(1.46)	93.3	(0.22)	86.4	(0.31)	77.3	(0.33)	94.2	(0.26)	83.4	(0.44)	86.8	(0.31)
$50,000 to $74,999	92.4	(0.71)	91.0	(0.73)	25.7	(1.17)	95.7	(0.14)	91.0	(0.18)	82.3	(0.25)	96.6	(0.12)	89.1	(0.20)	90.7	(0.17)
$75,000 to $99,999	95.2	(0.59)	93.7	(0.73)	32.2	(1.40)	97.5	(0.12)	94.8	(0.13)	88.0	(0.24)	98.0	(0.09)	94.0	(0.17)	93.6	(0.19)
$100,000 or more	98.3	(0.29)	97.2	(0.39)	45.9	(1.25)	99.0	(0.04)	97.8	(0.06)	93.8	(0.10)	99.1	(0.04)	97.3	(0.08)	96.5	(0.09)
$100,000 to $149,999	98.0	(0.44)	97.2	(0.53)	38.8	(1.48)	98.8	(0.06)	97.2	(0.09)	92.5	(0.14)	98.8	(0.07)	96.5	(0.13)	95.8	(0.15)
$150,000 or more	98.8	(0.36)	97.2	(0.59)	55.3	(1.62)	99.3	(0.05)	98.6	(0.08)	95.3	(0.12)	99.4	(0.05)	98.3	(0.08)	97.3	(0.08)

—Not available.
†Not applicable.
!Interpret data with caution. The coefficient of variation (CV) for this estimate is between 30 and 50 percent.
[1]In addition to the types of computers specified, includes a small percentage (less than 1 percent) of children whose households have "Some other type of computer" not listed in the survey questions.
[2]Households indicating that they had computers/devices in both categories—that is, desktop, laptop, netbook, or notebook computers as well as handheld computers or smart mobile phones—were counted only once in the total. Therefore, the total is less than the sum of the two categories.
[3]Children living in areas whose metropolitan status was not identified are excluded from this analysis. From 2010 through 2015, less than 1 percent of children ages 3 to 18 lived in an area with non-identified metropolitan status.
[4]Refers to metropolitan statistical areas, which contain at least one urbanized area with a population of 50,000 or more.
[5]Refers to areas that are outside of metropolitan statistical areas.
[6]Highest education level of any parent residing with the child (including an adoptive or stepparent). Includes only children who resided with at least one of their parents.
NOTE: Data are based on children living in households and exclude children living in institutions (e.g., prisons or nursing facilities). Percentages refer to children whose household members own or use at home any of the specified devices. Estimates for 2010 are based on the Current Population Survey, while estimates for 2013 and 2015 are based on the American Community Survey. As a result, estimates for 2010 may not be comparable to those for 2013 and 2015. Race categories exclude persons of Hispanic ethnicity.
SOURCE: U.S. Department of Commerce, Census Bureau, Current Population Survey (CPS), October 2010; and American Community Survey (ACS), 2013 and 2015. (This table was prepared January 2017.)

Table 2.1. Percentage of children ages 3 to 18 who use the Internet from home, by selected child and family characteristics: Selected years, 2010 through 2015

[Standard errors appear in parentheses]

Selected child or family characteristic	2010		2011		2012		2013		2015	
1	2		3		4		5		6	
Total	**57.7**	**(0.46)**	**56.4**	**(0.46)**	**63.1**	**(0.46)**	**58.3**	**(0.49)**	**60.7**	**(0.47)**
Sex										
Male	57.3	(0.48)	55.7	(0.57)	62.5	(0.55)	58.4	(0.63)	61.0	(0.56)
Female	58.2	(0.58)	57.1	(0.54)	63.8	(0.54)	58.3	(0.61)	60.5	(0.57)
Race/ethnicity										
White	65.9	(0.52)	64.0	(0.59)	70.0	(0.55)	65.0	(0.65)	66.3	(0.58)
Black	46.4	(1.32)	46.7	(1.34)	55.5	(1.24)	49.1	(1.44)	53.0	(1.29)
Hispanic	43.6	(1.00)	42.3	(1.01)	51.5	(1.04)	48.0	(1.11)	52.4	(1.10)
Asian	65.8	(2.01)	65.4	(2.24)	70.5	(1.82)	65.4	(2.16)	63.5	(1.82)
Pacific Islander	57.5	(9.00)	45.0	(6.43)	51.6	(6.96)	62.2	(7.76)	53.9	(9.07)
American Indian/Alaska Native	37.8	(4.61)	47.8	(4.54)	41.1	(4.55)	44.3	(4.00)	49.3	(4.10)
Two or more races	59.0	(2.44)	59.8	(2.37)	64.6	(2.12)	58.0	(2.76)	64.4	(2.40)
Age										
3 and 4	19.2	(0.73)	24.1	(0.85)	29.6	(0.87)	31.1	(1.12)	38.8	(0.96)
5 to 10	48.8	(0.70)	47.1	(0.66)	54.9	(0.62)	50.0	(0.77)	54.2	(0.71)
11 to 14	71.9	(0.78)	66.6	(0.78)	73.3	(0.74)	65.2	(0.82)	65.1	(0.81)
15 to 18	77.9	(0.59)	76.9	(0.61)	80.8	(0.67)	76.9	(0.71)	76.1	(0.62)
Metropolitan status[1]										
Metropolitan[2]	58.7	(0.52)	57.3	(0.50)	64.3	(0.51)	58.9	(0.54)	61.5	(0.50)
Nonmetropolitan[3]	52.6	(1.08)	50.5	(1.23)	56.5	(1.20)	55.9	(1.22)	56.1	(1.22)
Highest level of education attained by either parent[4]										
Less than high school	29.3	(1.43)	29.1	(1.38)	37.7	(1.64)	36.7	(1.58)	42.2	(1.70)
High school diploma or equivalent	47.4	(0.99)	47.3	(1.00)	54.1	(1.16)	48.7	(1.13)	51.5	(1.04)
Some college	58.6	(1.08)	57.2	(1.05)	61.7	(1.04)	58.4	(1.31)	59.8	(1.12)
Associate's degree	63.1	(1.17)	61.2	(1.36)	68.0	(1.26)	62.4	(1.39)	63.2	(1.50)
Bachelor's or higher degree	71.5	(0.65)	68.8	(0.62)	75.9	(0.64)	70.0	(0.72)	70.6	(0.69)
Bachelor's degree	71.5	(0.85)	67.8	(0.87)	74.9	(0.92)	69.1	(0.92)	70.1	(0.93)
Master's or higher degree	71.5	(0.99)	70.1	(1.02)	77.2	(0.86)	71.2	(1.21)	71.3	(1.08)
Family income (in current dollars)										
Less than $10,000	26.2	(1.41)	30.2	(1.52)	35.0	(1.71)	31.3	(1.77)	39.0	(2.03)
$10,000 to $19,999	39.7	(1.52)	37.7	(1.31)	42.0	(1.58)	42.9	(1.70)	40.3	(1.80)
$20,000 to $29,999	43.8	(1.31)	44.1	(1.43)	51.0	(1.45)	48.1	(1.63)	52.0	(1.56)
$30,000 to $39,999	52.3	(1.51)	48.6	(1.49)	57.0	(1.29)	49.6	(1.59)	54.6	(1.55)
$40,000 to $49,999	62.2	(1.50)	55.7	(1.60)	63.8	(1.46)	58.7	(1.64)	58.9	(1.79)
$50,000 to $74,999	64.3	(0.91)	64.6	(0.98)	71.2	(0.90)	63.4	(1.22)	65.8	(1.01)
$75,000 to $99,999	68.8	(1.23)	70.0	(1.10)	75.9	(1.13)	69.7	(1.30)	69.8	(1.23)
$100,000 or more	76.9	(0.77)	72.7	(0.89)	79.5	(0.72)	73.4	(0.97)	71.9	(0.91)
$100,000 to $149,999	75.0	(1.08)	74.0	(1.09)	78.8	(0.97)	72.3	(1.35)	71.5	(1.20)
$150,000 or more	79.5	(1.15)	70.9	(1.35)	80.4	(1.14)	75.0	(1.41)	72.4	(1.37)

[1]Children living in areas whose metropolitan status was not identified are excluded from this analysis. From 2010 through 2015, less than 1 percent of children ages 3 to 18 lived in an area with nonidentified metropolitan status.
[2]Refers to metropolitan statistical areas, which contain at least one urbanized area with a population of 50,000 or more.
[3]Refers to areas that are outside of metropolitan statistical areas.
[4]Highest education level of any parent residing with the child (including an adoptive or stepparent). Includes only children who resided with at least one of their parents.
NOTE: Race categories exclude persons of Hispanic ethnicity. Data exclude children living in institutions (e.g., prisons or nursing facilities). Data for 2011, 2013, and 2015 were collected in the July supplement to the Current Population Survey (CPS), while data for 2010 and 2012 were collected in the October supplement. The July supplement consists solely of questions about computer and internet use. In contrast, the October supplement focuses on school enrollment, although it also includes questions about computer and internet use. Measurable differences in estimates across years could reflect actual changes in the population; however, differences could also reflect seasonal variations in data collection or differences between the content of the July and October supplements. Therefore, caution should be used when making year-to-year comparisons.
SOURCE: U.S. Department of Commerce, Census Bureau, Current Population Survey (CPS), October 2010 and 2012 and July 2011, 2013, and 2015. (This table was prepared October 2016.)

Table 3.1. Percentage of children ages 3 to 18 who use the Internet and, among those who use the Internet, percentage using it in various locations, by selected child and family characteristics: 2011 and 2015

[Standard errors appear in parentheses]

Selected child or family characteristic	2011														2015													
	Percent using the Internet anywhere		Among children who use the Internet anywhere, percent using it in various locations[1]												Percent using the Internet anywhere		Among children who use the Internet anywhere, percent using it in various locations[1]											
			Home		School		Workplace		Library, community center, or other public place		Coffee shop or other business that offers internet access		Someone else's home				Home		School		Workplace		Library, community center, or other public place		Coffee shop or other business that offers internet access		Someone else's home		While traveling between places[2]	
1	2		3		4		5		6		7		8		9		10		11		12		13		14		15		16	
Total	**61.8**	**(0.45)**	**91.2**	**(0.34)**	**69.9**	**(0.48)**	**1.3**	**(0.10)**	**3.1**	**(0.22)**	**6.6**	**(0.29)**	**2.4**	**(0.16)**	**70.6**	**(0.49)**	**86.0**	**(0.35)**	**64.7**	**(0.53)**	**1.7**	**(0.12)**	**26.8**	**(0.49)**	**13.9**	**(0.39)**	**30.8**	**(0.48)**	**26.6**	**(0.50)**
Sex																												
Male	61.0	(0.54)	91.2	(0.41)	70.1	(0.62)	1.1	(0.12)	3.1	(0.29)	6.2	(0.36)	2.3	(0.22)	70.5	(0.59)	86.4	(0.47)	64.6	(0.64)	1.6	(0.16)	25.6	(0.62)	12.8	(0.47)	30.8	(0.59)	26.5	(0.61)
Female	62.6	(0.51)	91.1	(0.43)	69.7	(0.63)	1.5	(0.14)	3.1	(0.26)	6.9	(0.38)	2.4	(0.19)	70.7	(0.55)	85.5	(0.48)	64.9	(0.65)	1.9	(0.17)	28.1	(0.59)	15.0	(0.48)	30.9	(0.65)	26.8	(0.59)
Race/ethnicity																												
White	67.5	(0.57)	94.8	(0.34)	69.2	(0.64)	1.5	(0.14)	1.2	(0.17)	6.8	(0.36)	1.3	(0.15)	74.2	(0.56)	89.4	(0.44)	65.0	(0.70)	2.1	(0.16)	23.3	(0.64)	14.2	(0.48)	33.9	(0.72)	29.6	(0.67)
Black	54.8	(1.24)	85.1	(1.34)	72.3	(1.34)	1.0 !	(0.30)	6.0	(0.81)	5.2	(0.73)	5.1	(0.77)	66.6	(1.26)	79.6	(1.16)	65.9	(1.64)	1.4	(0.30)	33.7	(1.54)	12.1	(1.01)	28.5	(1.59)	23.3	(1.29)
Hispanic	51.0	(0.91)	82.9	(1.22)	71.5	(1.28)	1.0	(0.19)	7.5	(0.77)	6.3	(0.69)	4.5	(0.52)	64.7	(1.07)	81.0	(0.95)	64.0	(1.13)	1.1	(0.18)	28.7	(1.20)	13.0	(0.76)	24.8	(0.97)	21.4	(0.99)
Asian	66.7	(2.24)	98.0	(0.55)	66.6	(2.38)	0.8 !	(0.33)	‡	(†)	7.7	(1.36)	‡	(†)	70.1	(1.70)	90.5	(1.22)	60.9	(2.00)	1.3 !	(0.51)	31.6	(2.29)	15.7	(1.67)	27.5	(2.15)	25.8	(1.96)
Pacific Islander	50.3	(6.75)	89.6	(5.07)	68.0	(10.62)	‡	(†)	‡	(†)	12.9 !	(5.58)	‡	(†)	77.8	(5.66)	69.3	(10.40)	59.0	(7.79)	‡	(†)	46.3	(9.09)	16.9 !	(6.39)	26.7 !	(8.26)	11.9 !	(4.67)
American Indian/ Alaska Native	56.7	(4.61)	84.3	(5.02)	68.4	(5.58)	‡	(†)	4.6 !	(2.09)	7.0 !	(3.37)	1.7 !	(0.74)	66.5	(4.25)	74.1	(4.22)	74.8	(4.60)	‡	(†)	25.2	(4.85)	12.4	(3.69)	34.8	(5.59)	25.9	(5.46)
Two or more races	67.5	(2.18)	88.5	(1.90)	69.7	(2.53)	‡	(†)	5.0	(1.46)	7.3	(1.59)	2.9	(0.86)	74.3	(2.11)	86.6	(1.98)	63.7	(2.84)	1.5 !	(0.56)	34.0	(2.84)	16.7	(2.28)	33.6	(2.71)	27.8	(2.57)
Age																												
3 and 4	25.9	(0.85)	93.0	(0.96)	38.4	(1.99)	‡	(†)	0.9 !	(0.39)	3.9	(0.77)	1.1 !	(0.37)	44.9	(0.98)	86.4	(1.04)	30.8	(1.54)	‡	(†)	20.0	(1.30)	7.8	(0.78)	24.6	(1.42)	18.4	(1.23)
5 to 10	51.3	(0.63)	91.9	(0.52)	65.7	(0.89)	‡	(†)	2.7	(0.31)	3.1	(0.33)	1.5	(0.19)	65.7	(0.74)	82.5	(0.60)	62.7	(0.90)	‡	(†)	24.0	(0.72)	8.7	(0.48)	26.9	(0.76)	17.9	(0.70)
11 to 14	73.0	(0.73)	91.2	(0.54)	76.4	(0.75)	‡	(†)	3.4	(0.32)	5.2	(0.37)	2.2	(0.26)	75.7	(0.78)	85.9	(0.63)	71.9	(0.88)	‡	(†)	28.6	(0.86)	13.5	(0.58)	32.1	(0.81)	26.0	(0.85)
15 to 18	85.2	(0.54)	90.3	(0.46)	73.2	(0.68)	3.7	(0.27)	3.5	(0.28)	11.1	(0.56)	3.6	(0.30)	84.7	(0.54)	89.9	(0.44)	69.2	(0.82)	5.5	(0.37)	30.1	(0.75)	21.4	(0.72)	35.7	(0.81)	38.8	(0.80)
Metropolitan status[3]																												
Metropolitan[4]	62.6	(0.48)	91.7	(0.35)	69.7	(0.53)	1.2	(0.11)	3.0	(0.24)	6.6	(0.32)	2.3	(0.17)	70.8	(0.52)	86.8	(0.37)	64.0	(0.58)	1.7	(0.12)	27.5	(0.55)	14.1	(0.44)	31.3	(0.55)	26.8	(0.55)
Nonmetropolitan[5]	57.4	(1.17)	87.9	(1.07)	71.6	(1.15)	1.6	(0.28)	3.7	(0.55)	6.5	(0.78)	2.9	(0.44)	69.4	(1.32)	80.8	(1.08)	69.6	(1.40)	2.0	(0.29)	22.5	(1.13)	12.5	(1.05)	27.6	(1.21)	25.8	(1.22)
Highest level of education attained by either parent[6]																												
Less than high school	41.2	(1.44)	70.6	(2.18)	72.9	(1.81)	1.6	(0.45)	12.8	(1.53)	5.6	(0.92)	7.9	(1.03)	58.2	(1.73)	72.6	(2.08)	66.3	(2.10)	0.9	(0.25)	30.1	(2.21)	8.3	(1.12)	18.6	(1.68)	13.6	(1.54)
High school diploma or equivalent	54.5	(0.94)	86.7	(0.89)	68.7	(1.18)	1.2	(0.26)	5.5	(0.56)	4.7	(0.48)	4.8	(0.58)	63.9	(0.96)	80.6	(1.11)	63.5	(1.32)	1.5	(0.25)	24.2	(1.11)	11.0	(0.76)	24.3	(1.13)	19.7	(0.95)
Some college	63.1	(1.01)	90.6	(0.77)	68.3	(1.16)	0.7	(0.17)	2.7	(0.45)	5.3	(0.58)	2.2	(0.36)	71.4	(1.02)	83.7	(1.01)	64.3	(1.22)	1.4	(0.25)	28.2	(1.35)	13.5	(1.00)	29.2	(1.30)	24.2	(1.29)
Associate's degree	66.3	(1.27)	92.3	(0.93)	71.0	(1.45)	1.1	(0.26)	2.5	(0.61)	6.7	(0.82)	1.7	(0.40)	72.6	(1.34)	87.1	(1.14)	65.7	(1.56)	1.5	(0.32)	25.0	(1.45)	14.8	(1.17)	33.6	(1.63)	27.2	(1.25)
Bachelor's or higher degree	70.8	(0.60)	97.2	(0.32)	70.5	(0.76)	1.5	(0.18)	0.5	(0.11)	8.0	(0.46)	0.5	(0.10)	76.9	(0.69)	91.8	(0.45)	64.9	(0.78)	2.0	(0.17)	27.1	(0.76)	16.2	(0.61)	36.2	(0.86)	32.7	(0.85)
Bachelor's degree	70.1	(0.83)	96.8	(0.43)	71.8	(1.07)	1.5	(0.24)	0.5	(0.15)	8.2	(0.66)	0.5	(0.15)	76.9	(0.89)	91.2	(0.64)	65.7	(1.03)	1.9	(0.21)	26.3	(0.94)	15.4	(0.79)	36.2	(1.02)	31.3	(1.05)
Master's or higher degree	71.7	(1.00)	97.7	(0.45)	68.7	(1.05)	1.6	(0.26)	0.5 !	(0.16)	7.8	(0.63)	0.3 !	(0.12)	77.0	(1.03)	92.5	(0.59)	64.0	(1.22)	2.1	(0.27)	28.2	(1.22)	17.1	(0.96)	36.2	(1.43)	34.5	(1.28)
Family income (in current dollars)																												
Less than $10,000	43.0	(1.56)	70.2	(2.35)	69.7	(2.41)	0.7 !	(0.28)	11.6	(1.52)	5.2	(1.08)	9.2	(1.38)	58.7	(1.80)	66.3	(2.47)	68.2	(2.32)	0.7 !	(0.31)	31.9	(2.24)	12.4	(1.58)	27.9	(2.38)	16.3	(1.78)
$10,000 to $19,999	48.1	(1.37)	78.4	(1.83)	72.3	(1.74)	0.9	(0.26)	8.0	(1.21)	4.4	(0.74)	6.2	(0.96)	57.6	(1.73)	69.9	(1.99)	66.7	(2.04)	0.8	(0.23)	32.6	(1.80)	11.4	(1.29)	26.3	(1.95)	17.3	(1.48)
$20,000 to $29,999	52.0	(1.34)	84.9	(1.29)	70.1	(1.63)	1.3	(0.33)	5.8	(0.89)	5.7	(0.80)	5.3	(0.72)	65.3	(1.59)	79.6	(1.43)	63.1	(1.76)	1.4	(0.39)	28.1	(1.69)	9.9	(1.15)	25.3	(1.45)	19.8	(1.41)
$30,000 to $39,999	56.9	(1.45)	85.5	(1.20)	70.6	(1.46)	1.2	(0.29)	5.2	(0.78)	5.1	(0.70)	3.4	(0.51)	67.2	(1.43)	81.3	(1.39)	64.9	(1.72)	1.0	(0.27)	31.9	(1.67)	15.5	(1.31)	29.1	(1.60)	22.8	(1.54)
$40,000 to $49,999	60.3	(1.60)	92.3	(1.08)	69.1	(1.77)	0.5 !	(0.27)	3.0	(0.68)	5.6	(0.83)	2.1	(0.51)	68.3	(1.82)	86.2	(1.23)	64.4	(1.84)	1.4	(0.36)	24.2	(1.49)	11.7	(1.28)	29.2	(1.77)	22.9	(1.62)
$50,000 to $74,999	67.5	(0.98)	95.7	(0.51)	68.2	(1.18)	1.3	(0.22)	1.1	(0.27)	6.1	(0.56)	0.9	(0.21)	73.4	(1.04)	89.6	(0.76)	64.6	(1.27)	1.8	(0.28)	23.7	(1.12)	11.8	(0.87)	28.6	(1.16)	25.0	(1.11)
$75,000 to $99,999	72.4	(1.03)	96.7	(0.55)	70.0	(1.26)	1.4	(0.27)	0.6 !	(0.20)	8.0	(0.76)	0.6 !	(0.19)	75.8	(1.19)	92.2	(0.72)	64.9	(1.26)	1.5	(0.25)	25.0	(1.36)	13.2	(0.94)	32.8	(1.50)	30.8	(1.45)
$100,000 or more	74.0	(0.84)	98.1	(0.32)	70.3	(0.93)	1.8	(0.24)	0.4	(0.11)	8.4	(0.68)	0.3 !	(0.11)	78.0	(0.84)	92.2	(0.51)	64.2	(1.03)	2.7	(0.27)	25.7	(0.93)	17.8	(0.76)	36.1	(1.17)	34.7	(0.94)
$100,000 to $149,999	75.6	(1.04)	97.8	(0.38)	69.6	(1.17)	2.0	(0.34)	0.4 !	(0.16)	8.4	(0.89)	0.3 !	(0.15)	77.9	(1.08)	91.8	(0.75)	63.0	(1.41)	2.4	(0.33)	25.5	(1.30)	15.5	(0.94)	33.9	(1.47)	32.9	(1.25)
$150,000 or more	71.9	(1.28)	98.6	(0.48)	71.2	(1.66)	1.5	(0.34)	0.4 !	(0.17)	8.3	(0.85)	‡	(†)	78.2	(1.24)	92.7	(0.77)	65.5	(1.52)	3.0	(0.41)	26.0	(1.43)	20.5	(1.22)	38.7	(1.66)	36.8	(1.58)

†Not applicable.
!Interpret data with caution. The coefficient of variation (CV) for this estimate is between 30 and 50 percent.
‡Reporting standards not met. Either there are too few cases for a reliable estimate or the coefficient of variation (CV) is 50 percent or greater.
[1]Percentages sum to more than 100 because a child could have used the Internet in more than one location.
[2]Data on internet access while traveling between places were collected only in 2015.
[3]Children living in areas whose metropolitan status was not identified are excluded from this analysis. In 2011 and 2015, less than 1 percent of children ages 3 to 18 lived in an area with non-identified metropolitan status.
[4]Refers to metropolitan statistical areas, which contain at least one urbanized area with a population of 50,000 or more.
[5]Refers to areas that are outside of metropolitan statistical areas.
[6]Highest education level of any parent residing with the child (including an adoptive or stepparent). Includes only children who resided with at least one of their parents.
NOTE: Race categories exclude persons of Hispanic ethnicity. Data exclude children living in institutions (e.g., prisons or nursing facilities).
SOURCE: U.S. Department of Commerce, Census Bureau, Current Population Survey (CPS), July 2011 and 2015. (This table was prepared October 2016.)

Table 4.1. Percentage of home internet users age 3 and over and ages 3 to 18, by means of internet access from home and selected characteristics: 2010 and 2015

[Standard errors appear in parentheses]

Selected characteristic	2010										2015									
	Dial-up service		High-speed internet service installed at home[1]		Satellite internet service		Mobile internet service or a data plan[2]		Some othe service[3]		Dial-up service		High-speed internet service installed at home[1]		Satellite internet service		Mobile internet service or a data plan[2]		Some other service[3]	
1	2		3		4		5		6		7		8		9		10		11	
Total, all persons age 3 and over	**3.5**	**(0.12)**	**87.8**	**(0.24)**	**2.7**	**(0.13)**	**8.9**	**(0.20)**	**1.3**	**(0.07)**	**0.6**	**(0.05)**	**77.4**	**(0.34)**	**3.5**	**(0.14)**	**63.5**	**(0.37)**	**0.6**	**(0.05)**
Sex																				
Male	3.3	(0.13)	88.2	(0.27)	2.7	(0.14)	9.0	(0.22)	1.3	(0.08)	0.5	(0.05)	77.8	(0.37)	3.5	(0.15)	63.6	(0.40)	0.6	(0.06)
Female	3.8	(0.13)	87.5	(0.25)	2.7	(0.14)	8.9	(0.20)	1.4	(0.08)	0.6	(0.05)	77.1	(0.35)	3.6	(0.15)	63.3	(0.39)	0.6	(0.05)
Race/ethnicity																				
White	3.6	(0.13)	87.7	(0.29)	3.0	(0.18)	9.0	(0.23)	1.2	(0.08)	0.6	(0.05)	79.6	(0.37)	3.7	(0.17)	62.2	(0.39)	0.6	(0.06)
Black	3.7	(0.41)	87.1	(0.68)	1.5	(0.25)	9.4	(0.61)	1.7	(0.23)	0.5	(0.12)	71.9	(0.94)	2.5	(0.31)	65.7	(0.93)	0.6	(0.14)
Hispanic	3.5	(0.38)	87.6	(0.71)	2.1	(0.31)	8.4	(0.61)	1.8	(0.26)	0.8	(0.15)	70.4	(0.90)	3.5	(0.35)	67.5	(0.87)	0.8	(0.17)
Asian	1.8	(0.42)	92.9	(0.72)	1.4	(0.33)	6.9	(0.72)	0.8	(0.20)	0.2!	(0.09)	80.4	(1.17)	2.5	(0.45)	61.4	(1.36)	0.2!	(0.09)
Pacific Islander	1.9!	(0.92)	91.0	(2.45)	‡	(†)	7.2!	(2.34)	‡	(†)	‡	(†)	75.8	(4.55)	‡	(†)	77.3	(3.58)	‡	(†)
American Indian/Alaska Native	7.9	(2.26)	75.7	(3.39)	3.0!	(1.09)	13.2	(3.33)	2.2!	(0.95)	‡	(†)	68.2	(3.92)	6.0!	(1.80)	72.2	(3.69)	‡	(†)
Two or more races	3.4	(0.78)	88.4	(1.50)	2.5	(0.60)	10.5	(1.40)	0.9!	(0.33)	0.3!	(0.13)	80.8	(1.50)	3.7	(0.75)	64.8	(2.10)	0.8!	(0.29)
Age																				
3 and 4	2.4!	(0.74)	89.4	(1.44)	2.1	(0.62)	10.1	(1.26)	1.4!	(0.60)	‡	(†)	79.0	(1.32)	3.0	(0.57)	70.1	(1.36)	‡	(†)
5 to 10	2.2	(0.26)	90.1	(0.54)	2.5	(0.30)	9.4	(0.56)	1.3	(0.22)	0.4!	(0.16)	78.7	(0.72)	4.0	(0.39)	68.5	(0.91)	0.6	(0.15)
11 to 14	2.8	(0.32)	88.5	(0.57)	2.7	(0.29)	9.3	(0.55)	1.0	(0.17)	0.3	(0.09)	79.3	(0.82)	3.9	(0.38)	65.0	(1.10)	0.5	(0.12)
15 to 18	3.2	(0.28)	88.1	(0.53)	2.9	(0.30)	8.6	(0.45)	1.1	(0.17)	0.4	(0.11)	77.3	(0.84)	3.4	(0.33)	66.5	(0.85)	0.6	(0.16)
19 to 24	3.0	(0.27)	86.8	(0.54)	2.7	(0.25)	9.9	(0.47)	1.8	(0.25)	0.5	(0.11)	75.0	(0.70)	2.9	(0.25)	69.0	(0.85)	0.7	(0.11)
25 to 29	2.1	(0.22)	87.0	(0.52)	2.6	(0.26)	11.3	(0.53)	2.0	(0.23)	0.3	(0.10)	75.3	(0.72)	2.6	(0.25)	68.6	(0.83)	0.7	(0.12)
30 to 39	2.5	(0.16)	87.4	(0.47)	2.4	(0.23)	11.3	(0.35)	1.7	(0.15)	0.3	(0.06)	75.4	(0.58)	3.1	(0.25)	68.6	(0.58)	0.7	(0.10)
40 to 49	2.9	(0.18)	88.3	(0.38)	2.8	(0.21)	9.1	(0.33)	1.2	(0.13)	0.4	(0.07)	78.0	(0.56)	3.4	(0.22)	66.2	(0.54)	0.6	(0.09)
50 to 59	4.4	(0.26)	88.6	(0.42)	2.8	(0.25)	7.3	(0.30)	0.9	(0.11)	0.7	(0.11)	78.5	(0.50)	4.1	(0.27)	60.4	(0.65)	0.6	(0.09)
60 to 69	6.0	(0.35)	87.3	(0.48)	2.9	(0.23)	6.1	(0.36)	1.0	(0.16)	0.9	(0.11)	79.1	(0.52)	4.0	(0.28)	54.1	(0.70)	0.7	(0.10)
70 or older	8.4	(0.50)	85.8	(0.69)	2.4	(0.30)	4.1	(0.43)	1.0	(0.19)	1.5	(0.20)	78.8	(0.78)	3.8	(0.32)	44.1	(0.87)	0.6	(0.12)
Metropolitan status[4]																				
Metropolitan[5]	3.0	(0.12)	89.2	(0.24)	2.1	(0.11)	8.8	(0.21)	1.3	(0.08)	0.5	(0.05)	78.5	(0.36)	3.0	(0.14)	63.9	(0.38)	0.6	(0.05)
Nonmetropolitan[6]	6.8	(0.37)	79.8	(0.86)	6.1	(0.64)	9.4	(0.65)	1.4	(0.21)	0.8	(0.12)	70.2	(1.17)	7.0	(0.48)	60.1	(1.11)	0.9	(0.18)
Family income (in current dollars)																				
Less than $10,000	5.5	(0.56)	84.8	(1.00)	1.9	(0.41)	9.3	(0.80)	2.2	(0.35)	0.8	(0.22)	64.8	(1.48)	3.1	(0.53)	65.3	(1.26)	1.2	(0.30)
$10,000 to $19,999	6.4	(0.52)	83.3	(0.95)	2.3	(0.37)	8.7	(0.70)	1.5	(0.27)	1.1	(0.24)	68.4	(1.17)	3.3	(0.44)	61.3	(1.16)	1.2	(0.22)
$20,000 to $29,999	5.3	(0.44)	84.3	(0.82)	2.5	(0.38)	8.5	(0.60)	1.7	(0.26)	0.9	(0.22)	70.4	(1.07)	3.2	(0.36)	59.6	(0.96)	1.0	(0.22)
$30,000 to $39,999	4.8	(0.42)	85.2	(0.69)	2.8	(0.29)	8.5	(0.56)	1.6	(0.25)	0.7	(0.13)	71.5	(0.97)	3.6	(0.41)	61.0	(1.10)	0.8	(0.16)
$40,000 to $49,999	4.4	(0.40)	85.9	(0.75)	2.8	(0.35)	8.9	(0.60)	1.4	(0.23)	0.6	(0.12)	76.5	(0.93)	3.4	(0.40)	61.7	(1.08)	0.3!	(0.14)
$50,000 to $74,999	3.3	(0.24)	88.5	(0.51)	2.9	(0.26)	8.2	(0.44)	1.1	(0.14)	0.5	(0.10)	78.2	(0.65)	3.6	(0.28)	62.5	(0.72)	0.6	(0.11)
$75,000 to $99,999	2.6	(0.28)	89.3	(0.54)	2.6	(0.28)	9.1	(0.47)	1.2	(0.17)	0.5	(0.11)	80.6	(0.75)	3.9	(0.38)	63.4	(0.92)	0.6	(0.15)
$100,000 or more	1.7	(0.17)	91.4	(0.44)	2.7	(0.26)	9.8	(0.41)	1.1	(0.14)	0.3	(0.07)	83.2	(0.52)	3.5	(0.25)	66.8	(0.64)	0.4	(0.08)
$100,000 to $149,999	2.0	(0.25)	90.9	(0.59)	2.6	(0.35)	8.8	(0.46)	1.0	(0.17)	0.4	(0.10)	82.5	(0.67)	3.6	(0.32)	65.4	(0.87)	0.4!	(0.12)
$150,000 or more	1.3	(0.22)	92.0	(0.61)	2.8	(0.36)	11.3	(0.67)	1.2	(0.23)	0.3	(0.07)	84.2	(0.72)	3.2	(0.35)	68.5	(0.92)	0.4	(0.11)

See notes at end of table.

Table 4.1. Percentage of home internet users age 3 and over and ages 3 to 18, by means of internet access from home and selected characteristics: 2010 and 2015—Continued

[Standard errors appear in parentheses]

Selected characteristic	2010										2015									
	Dial-up service		High-speed internet service installed at home[1]		Satellite internet service		Mobile internet service or a data plan[2]		Some other service[3]		Dial-up service		High-speed internet service installed at home[1]		Satellite internet service		Mobile internet service or a data plan[2]		Some other service[3]	
1	2		3		4		5		6		7		8		9		10		11	
Total, all 3- to 18-year-olds	**2.7**	**(0.20)**	**88.9**	**(0.40)**	**2.7**	**(0.20)**	**9.1**	**(0.36)**	**1.2**	**(0.13)**	**0.4**	**(0.08)**	**78.4**	**(0.57)**	**3.7**	**(0.26)**	**67.0**	**(0.64)**	**0.6**	**(0.10)**
Sex																				
Male	2.6	(0.24)	89.2	(0.50)	2.5	(0.23)	9.3	(0.42)	1.1	(0.15)	0.3	(0.08)	78.2	(0.68)	3.6	(0.30)	66.3	(0.76)	0.6	(0.11)
Female	2.9	(0.27)	88.6	(0.48)	2.9	(0.24)	8.9	(0.44)	1.2	(0.16)	0.5	(0.13)	78.7	(0.67)	3.9	(0.32)	67.8	(0.76)	0.6	(0.13)
Race/ethnicity																				
White	2.5	(0.21)	89.1	(0.52)	3.2	(0.28)	9.6	(0.45)	1.0	(0.15)	0.3!	(0.09)	80.9	(0.67)	4.1	(0.33)	67.2	(0.78)	0.6	(0.14)
Black	3.4	(0.72)	87.1	(1.23)	1.6	(0.44)	9.5	(1.15)	1.5!	(0.46)	‡	(†)	74.0	(1.65)	2.0	(0.52)	67.4	(1.62)	0.6!	(0.25)
Hispanic	3.3	(0.48)	88.2	(1.02)	2.3	(0.43)	7.3	(0.85)	1.7	(0.45)	0.7!	(0.24)	72.8	(1.39)	4.0	(0.58)	67.1	(1.35)	0.7	(0.19)
Asian	2.1!	(0.89)	92.9	(1.42)	‡	(†)	6.8	(1.18)	‡	(†)	‡	(†)	81.5	(2.02)	3.3	(0.91)	62.4	(2.55)	‡	(†)
Pacific Islander	‡	(†)	93.2	(3.77)	‡	(†)	‡	(†)	‡	(†)	‡	(†)	73.7	(9.01)	‡	(†)	81.9	(5.42)	‡	(†)
American Indian/Alaska Native	9.0!	(3.79)	80.2	(5.18)	‡	(†)	11.0 !	(4.28)	‡	(†)	‡	(†)	66.4	(7.04)	‡	(†)	77.7	(7.23)	‡	(†)
Two or more races	2.6!	(0.88)	89.5	(2.21)	1.6!	(0.64)	11.7	(2.16)	‡	(†)	‡	(†)	84.1	(2.14)	2.3 !	(0.85)	66.8	(2.94)	‡	(†)
Metropolitan status[4]																				
Metropolitan[5]	2.3	(0.21)	90.3	(0.39)	2.1	(0.19)	8.9	(0.37)	1.1	(0.14)	0.3	(0.09)	79.4	(0.60)	3.4	(0.27)	67.0	(0.69)	0.5	(0.09)
Nonmetropolitan[6]	5.0	(0.66)	81.1	(1.46)	6.1	(0.95)	10.7	(1.19)	1.4	(0.37)	0.7!	(0.31)	72.5	(1.67)	5.9	(0.82)	67.3	(1.61)	1.1!	(0.38)
Highest level of education attained by either parent[7]																				
Less than high school	5.0	(1.14)	83.9	(1.96)	3.4	(0.92)	8.4	(1.52)	2.0!	(0.85)	‡	(†)	69.7	(2.36)	2.3	(0.67)	64.3	(2.58)	1.0!	(0.44)
High school diploma or equivalent	4.4	(0.70)	86.4	(1.01)	2.5	(0.43)	8.2	(0.79)	1.3	(0.31)	0.5!	(0.22)	70.0	(1.42)	4.2	(0.58)	66.7	(1.44)	0.9	(0.27)
Some college	2.8	(0.50)	88.1	(1.04)	2.3	(0.46)	10.0	(0.93)	1.2	(0.28)	0.4!	(0.15)	78.8	(1.34)	2.8	(0.48)	66.2	(1.62)	0.6	(0.18)
Associate's degree	3.7	(0.57)	86.8	(1.13)	3.7	(0.64)	10.1	(1.01)	1.2	(0.28)	‡	(†)	80.2	(1.40)	4.1	(0.68)	66.0	(1.56)	‡	(†)
Bachelor's or higher degree	1.4	(0.20)	91.8	(0.53)	2.5	(0.32)	9.2	(0.53)	0.8	(0.18)	0.2!	(0.09)	83.1	(0.85)	3.8	(0.40)	68.3	(0.94)	0.4	(0.10)
Bachelor's degree	1.7	(0.30)	91.7	(0.70)	2.3	(0.39)	8.8	(0.65)	0.8!	(0.25)	0.2!	(0.11)	82.0	(1.17)	3.7	(0.53)	67.2	(1.17)	0.4!	(0.15)
Master's or higher degree	0.9	(0.27)	92.0	(0.83)	2.7	(0.52)	9.8	(0.89)	0.9	(0.26)	‡	(†)	84.4	(1.07)	4.0	(0.54)	69.6	(1.38)	0.3!	(0.11)
Family income (in current dollars)																				
Less than $10,000	4.7	(1.24)	86.3	(2.01)	2.2!	(0.80)	8.4	(1.63)	2.0!	(0.75)	‡	(†)	61.2	(3.31)	2.7 !	(1.05)	72.2	(2.63)	1.8!	(0.72)
$10,000 to $19,999	4.0	(0.89)	85.2	(1.90)	2.2!	(0.66)	8.9	(1.32)	1.4!	(0.53)	‡	(†)	72.6	(2.46)	2.4	(0.67)	68.3	(2.49)	‡	(†)
$20,000 to $29,999	5.4	(0.99)	83.0	(1.76)	2.9	(0.76)	9.1	(1.21)	1.4!	(0.51)	‡	(†)	70.2	(2.10)	3.3	(0.82)	62.9	(2.02)	1.2!	(0.47)
$30,000 to $39,999	3.1	(0.63)	87.8	(1.31)	2.1	(0.46)	8.5	(1.11)	2.1!	(0.65)	‡	(†)	72.5	(1.93)	4.0	(0.74)	66.7	(2.02)	0.7!	(0.24)
$40,000 to $49,999	4.9	(0.85)	87.3	(1.35)	2.9	(0.65)	7.1	(0.97)	1.0!	(0.35)	‡	(†)	77.5	(1.94)	4.2	(0.80)	66.2	(2.20)	‡	(†)
$50,000 to $74,999	2.3	(0.42)	89.8	(0.90)	2.9	(0.46)	8.7	(0.84)	0.9	(0.27)	0.5!	(0.22)	77.9	(1.22)	4.1	(0.62)	66.3	(1.40)	0.7!	(0.27)
$75,000 to $99,999	1.7	(0.34)	90.4	(0.85)	2.6	(0.49)	10.5	(1.01)	0.8!	(0.26)	‡	(†)	81.4	(1.40)	4.5	(0.72)	66.4	(1.56)	0.5!	(0.22)
$100,000 or more	1.2	(0.26)	91.8	(0.76)	2.9	(0.43)	9.8	(0.74)	0.9	(0.24)	0.2!	(0.07)	85.2	(0.85)	3.5	(0.44)	68.5	(1.17)	0.2!	(0.11)
$100,000 to $149,999	1.3	(0.35)	91.9	(0.83)	2.9	(0.58)	8.2	(0.81)	0.8	(0.25)	0.3!	(0.11)	84.8	(1.18)	3.8	(0.58)	67.4	(1.42)	‡	(†)
$150,000 or more	1.0!	(0.39)	91.6	(1.25)	3.0	(0.67)	11.9	(1.26)	1.1!	(0.42)	‡	(†)	85.8	(1.21)	3.1	(0.62)	69.7	(1.67)	‡	(†)

† Not applicable.
! Interpret data with caution. The coefficient of variation (CV) for this estimate is between 30 and 50 percent.
‡ Reporting standards not met. Either there are too few cases for a reliable estimate or the coefficient of variation (CV) is 50 percent or greater.
[1] Includes cable, DSL, or fiber-optic service.
[2] Includes data plan for a cellular phone, smartphone, tablet, laptop, or other device.
[3] Respondents were asked whether they accessed the Internet at home using "some other service." Examples of other services were not provided to respondents.
[4] Persons living in areas whose metropolitan status was not identified are excluded from this analysis. In 2010 and 2015, less than 1 percent of persons lived in an area with nonidentified metropolitan status.
[5] Refers to metropolitan statistical areas, which contain at least one urbanized area with a population of 50,000 or more.
[6] Refers to areas that are outside of metropolitan statistical areas.
[7] Highest education level of any parent residing with the child (including an adoptive or stepparent). Includes only children who resided with at least one of their parents.
NOTE: Includes only persons who use the Internet from home. The different types of internet access may sum to more than 100 percent because a single home internet user can have more than one type of access (e.g., high-speed internet service plus a mobile phone data plan). Data are based on sample surveys of the civilian noninstitutionalized population, which excludes persons in the military and persons living in institutions (e.g., prisons or nursing facilities). Data for 2015 were collected in the July supplement to the Current Population Survey (CPS), while data for 2010 were collected in the October supplement. The July supplement consists solely of questions about computer and internet use. In contrast, the October supplement focuses on school enrollment, although it also includes questions about computer and internet use. Measurable differences in estimates across years could reflect actual changes in the population; however, differences could also reflect seasonal variations in data collection or differences between the content of the July and October supplements. Therefore, caution should be used when making year-to-year comparisons. Race categories exclude persons of Hispanic ethnicity.
SOURCE: U.S. Department of Commerce, Census Bureau, Current Population Survey (CPS), October 2010 and July 2015. (This table was prepared December 2016.)

Table 5.1. Average National Assessment of Educational Progress (NAEP) reading scale score and percentage distribution of 4th- and 8th-graders, by computer use and internet access at home and other selected characteristics: 2015

[Standard errors appear in parentheses]

Selected characteristic	Percent of all students		Average reading scale score[1]								Percentage distribution of students							
			All students		Student uses a computer at home				Student has access to Internet at home[2]				Student uses a computer at home				Student has access to Internet at home[2]			
					Yes		No		Yes		No		Yes		No		Yes		No	
1	2		3		4		5		6		7		8		9		10		11	
Grade 4																				
All 4th-graders	**100**	**(†)**	**223**	**(0.4)**	**225**	**(0.4)**	**209**	**(0.7)**	**227**	**(0.3)**	**200**	**(0.6)**	**83**	**(0.2)**	**17**	**(0.2)**	**83**	**(0.3)**	**17**	**(0.3)**
Sex																				
Male	51	(0.2)	219	(0.4)	222	(0.5)	206	(0.7)	224	(0.4)	196	(0.8)	82	(0.3)	18	(0.3)	83	(0.3)	17	(0.3)
Female	49	(0.2)	226	(0.4)	229	(0.4)	212	(0.9)	231	(0.4)	203	(0.7)	85	(0.3)	15	(0.3)	83	(0.3)	17	(0.3)
Race/ethnicity																				
White	51	(0.3)	232	(0.3)	234	(0.3)	221	(0.6)	235	(0.3)	213	(0.6)	87	(0.3)	13	(0.3)	87	(0.3)	13	(0.3)
Black	15	(0.3)	206	(0.5)	208	(0.5)	200	(1.0)	211	(0.5)	189	(0.9)	80	(0.5)	20	(0.5)	79	(0.6)	21	(0.6)
Hispanic	25	(0.3)	208	(0.8)	211	(0.8)	200	(1.4)	215	(0.7)	190	(1.3)	77	(0.6)	23	(0.6)	75	(0.6)	25	(0.6)
Asian	5	(0.2)	241	(1.6)	242	(1.5)	224	(3.8)	244	(1.4)	202	(2.8)	92	(0.6)	8	(0.6)	92	(0.7)	8	(0.7)
Pacific Islander	#	(†)	215	(2.9)	219	(3.5)	199	(4.3)	221	(3.1)	193	(4.0)	80	(2.4)	20	(2.4)	76	(2.6)	24	(2.6)
American Indian/Alaska Native	1	(#)	205	(1.5)	211	(1.9)	198	(2.4)	215	(1.9)	186	(2.0)	72	(1.9)	28	(1.9)	67	(1.5)	33	(1.5)
Two or more races	3	(0.1)	227	(1.2)	230	(1.2)	215	(2.0)	231	(1.3)	206	(1.8)	85	(0.8)	15	(0.8)	85	(0.8)	15	(0.8)
English language learner (ELL) status																				
ELL	10	(0.3)	189	(1.1)	191	(1.0)	185	(1.8)	195	(0.9)	176	(1.7)	74	(1.0)	26	(1.0)	68	(1.2)	32	(1.2)
Non-ELL	90	(0.3)	226	(0.3)	229	(0.3)	214	(0.5)	230	(0.3)	205	(0.5)	85	(0.2)	15	(0.2)	84	(0.2)	16	(0.2)
Disability status[3]																				
Identified as student with disability (SD)	12	(0.1)	187	(0.7)	191	(0.7)	174	(1.2)	194	(0.7)	166	(1.3)	80	(0.5)	20	(0.5)	74	(0.6)	26	(0.6)
Not identified as SD	88	(0.1)	228	(0.3)	230	(0.4)	215	(0.7)	231	(0.3)	207	(0.5)	84	(0.2)	16	(0.2)	84	(0.2)	16	(0.2)
Percent of students in school eligible for free or reduced-price lunch																				
0–25 percent eligible	19	(0.8)	241	(0.5)	242	(0.5)	231	(2.1)	243	(0.5)	220	(1.5)	94	(0.3)	6	(0.3)	92	(0.4)	8	(0.4)
26–50 percent eligible	24	(0.9)	228	(0.5)	230	(0.5)	218	(1.0)	231	(0.5)	209	(1.1)	87	(0.4)	13	(0.4)	86	(0.5)	14	(0.5)
51–75 percent eligible	26	(1.0)	219	(0.6)	221	(0.7)	211	(1.1)	223	(0.6)	201	(1.4)	81	(0.5)	19	(0.5)	80	(0.5)	20	(0.5)
76–100 percent eligible	30	(0.8)	205	(0.6)	207	(0.6)	200	(1.1)	211	(0.5)	190	(1.1)	74	(0.7)	26	(0.7)	73	(0.5)	27	(0.5)
School control[4]																				
Public	92	(0.2)	221	(0.4)	224	(0.4)	208	(0.7)	226	(0.3)	199	(0.6)	83	(0.2)	17	(0.2)	82	(0.3)	18	(0.3)
Private	‡	(†)	‡	(†)	‡	(†)	‡	(†)	‡	(†)	‡	(†)	‡	(†)	‡	(†)	‡	(†)	‡	(†)
School locale																				
City	31	(0.4)	218	(0.6)	221	(0.6)	205	(1.0)	223	(0.6)	193	(0.8)	82	(0.4)	18	(0.4)	81	(0.4)	19	(0.4)
Large	17	(0.3)	215	(0.8)	218	(0.8)	203	(1.2)	221	(0.9)	191	(0.8)	82	(0.5)	18	(0.5)	80	(0.5)	20	(0.5)
Midsize	7	(0.4)	219	(1.7)	222	(1.7)	205	(2.5)	225	(1.6)	193	(2.1)	83	(1.1)	17	(1.1)	83	(1.1)	17	(1.1)
Small	7	(0.5)	222	(1.6)	225	(1.5)	208	(2.3)	227	(1.4)	199	(2.5)	82	(0.9)	18	(0.9)	82	(1.2)	18	(1.2)
Suburb	41	(0.4)	227	(0.6)	229	(0.6)	210	(1.2)	231	(0.5)	202	(1.2)	87	(0.4)	13	(0.4)	85	(0.5)	15	(0.5)
Large	34	(0.6)	228	(0.6)	230	(0.6)	210	(1.2)	232	(0.6)	203	(1.1)	88	(0.4)	12	(0.4)	86	(0.5)	14	(0.5)
Midsize	4	(0.4)	224	(1.7)	226	(1.9)	211	(2.8)	228	(1.5)	200	(3.6)	85	(1.0)	15	(1.0)	85	(1.2)	15	(1.2)
Small	2	(0.3)	217	(4.3)	219	(4.1)	206	(5.6)	224	(2.7)	191	(6.9)	83	(2.1)	17	(2.1)	78	(3.4)	22	(3.4)
Town	11	(0.4)	219	(1.2)	222	(0.8)	210	(2.7)	224	(0.8)	201	(2.7)	78	(0.6)	22	(0.6)	78	(0.9)	22	(0.9)
Fringe	3	(0.3)	219	(4.1)	223	(2.5)	203	(9.9)	225	(2.0)	193	(10.7)	79	(1.9)	21	(1.9)	79	(2.8)	21	(2.8)
Distant	5	(0.3)	219	(1.2)	221	(1.2)	214	(1.6)	223	(1.3)	205	(1.7)	79	(0.9)	21	(0.9)	78	(1.0)	22	(1.0)
Remote	3	(0.2)	218	(1.1)	222	(1.2)	209	(1.9)	223	(1.2)	202	(1.7)	77	(0.8)	23	(0.8)	78	(1.2)	22	(1.2)
Rural	17	(0.3)	224	(0.6)	226	(0.6)	214	(1.0)	228	(0.5)	206	(0.8)	81	(0.7)	19	(0.7)	82	(0.6)	18	(0.6)
Fringe	9	(0.3)	226	(0.9)	229	(0.9)	214	(1.3)	229	(0.8)	206	(1.3)	83	(1.1)	17	(1.1)	85	(0.8)	15	(0.8)
Distant	6	(0.3)	222	(0.8)	225	(0.8)	216	(1.4)	226	(0.8)	208	(1.3)	78	(0.8)	22	(0.8)	79	(0.8)	21	(0.8)
Remote	2	(0.1)	216	(1.1)	219	(1.4)	210	(1.6)	222	(1.1)	200	(1.7)	78	(1.3)	22	(1.3)	72	(1.8)	28	(1.8)
Grade 8																				
All 8th-graders	**100**	**(†)**	**265**	**(0.2)**	**268**	**(0.2)**	**247**	**(0.5)**	**267**	**(0.2)**	**242**	**(0.6)**	**88**	**(0.1)**	**12**	**(0.1)**	**92**	**(0.1)**	**8**	**(0.1)**
Sex																				
Male	51	(0.2)	261	(0.2)	263	(0.3)	243	(0.6)	263	(0.3)	237	(0.8)	88	(0.2)	12	(0.2)	92	(0.2)	8	(0.2)
Female	49	(0.2)	270	(0.3)	273	(0.3)	251	(0.8)	272	(0.3)	248	(0.9)	89	(0.2)	11	(0.2)	93	(0.1)	7	(0.1)
Race/ethnicity																				
White	52	(0.4)	274	(0.2)	276	(0.2)	256	(0.7)	276	(0.2)	257	(0.7)	92	(0.1)	8	(0.1)	94	(0.1)	6	(0.1)
Black	15	(0.3)	248	(0.5)	250	(0.5)	239	(0.9)	250	(0.5)	224	(1.5)	84	(0.4)	16	(0.4)	91	(0.3)	9	(0.3)
Hispanic	24	(0.4)	253	(0.4)	256	(0.4)	243	(0.9)	256	(0.4)	232	(1.2)	81	(0.5)	19	(0.5)	89	(0.4)	11	(0.4)
Asian	5	(0.2)	281	(1.3)	283	(1.3)	249	(4.2)	283	(1.3)	237	(4.7)	97	(0.4)	3	(0.4)	97	(0.4)	3	(0.4)
Pacific Islander	#	(†)	255	(2.4)	260	(2.6)	238	(7.2)	260	(2.3)	228	(5.3)	83	(2.8)	17	(2.8)	85	(2.0)	15	(2.0)
American Indian/Alaska Native	1	(#)	252	(1.7)	258	(1.5)	242	(4.0)	258	(1.8)	233	(2.6)	74	(1.6)	26	(1.6)	79	(1.3)	21	(1.3)
Two or more races	2	(0.1)	269	(1.1)	271	(1.1)	253	(2.3)	270	(1.0)	254	(3.0)	88	(0.7)	12	(0.7)	93	(0.5)	7	(0.5)
English language learner (ELL) status																				
ELL	6	(0.1)	223	(0.9)	226	(1.0)	216	(1.3)	227	(0.9)	206	(1.8)	75	(0.8)	25	(0.8)	82	(0.9)	18	(0.9)
Non-ELL	94	(0.1)	268	(0.2)	270	(0.2)	251	(0.5)	270	(0.2)	248	(0.6)	89	(0.1)	11	(0.1)	93	(0.1)	7	(0.1)
Disability status[3]																				
Identified as student with disability (SD)	12	(0.1)	230	(0.6)	233	(0.7)	217	(1.2)	234	(0.6)	207	(1.3)	83	(0.5)	17	(0.5)	85	(0.4)	15	(0.4)
Not identified as SD	88	(0.1)	270	(0.2)	272	(0.2)	253	(0.6)	271	(0.2)	252	(0.7)	89	(0.1)	11	(0.1)	93	(0.1)	7	(0.1)

See notes at end of table.

Table 5.1. Average National Assessment of Educational Progress (NAEP) reading scale score and percentage distribution of 4th- and 8th-graders, by computer use and internet access at home and other selected characteristics: 2015—Continued

[Standard errors appear in parentheses]

Selected characteristic	Percent of all students		Average reading scale score[1]						Percentage distribution of students					
			All students		Student uses a computer at home		Student has access to Internet at home[2]		Student uses a computer at home		Student has access to Internet at home[2]			
					Yes		No		Yes		No		Yes		No	
1	2		3		4		5		6		7		8		9		10		11	
Percent of students in school eligible for free or reduced-price lunch																				
0–25 percent eligible	21	(0.8)	281	(0.5)	282	(0.6)	258	(1.5)	282	(0.5)	263	(1.7)	96	(0.3)	4	(0.3)	96	(0.2)	4	(0.2)
26–50 percent eligible	29	(0.9)	269	(0.5)	271	(0.5)	254	(1.2)	271	(0.5)	252	(1.3)	91	(0.2)	9	(0.2)	93	(0.3)	7	(0.3)
51–75 percent eligible	25	(1.0)	261	(0.6)	263	(0.6)	249	(1.0)	263	(0.5)	241	(1.3)	85	(0.5)	15	(0.5)	91	(0.3)	9	(0.3)
76–100 percent eligible	25	(0.8)	248	(0.6)	251	(0.6)	240	(0.9)	251	(0.6)	229	(1.2)	79	(0.5)	21	(0.5)	88	(0.4)	12	(0.4)
School control[4]																				
Public	92	(0.2)	264	(0.2)	267	(0.3)	246	(0.5)	266	(0.2)	242	(0.6)	88	(0.2)	12	(0.2)	92	(0.1)	8	(0.1)
Private	‡	(†)	‡	(†)	‡	(†)	‡	(†)	‡	(†)	‡	(†)	‡	(†)	‡	(†)	‡	(†)	‡	(†)
School locale																				
City	30	(0.4)	261	(0.6)	265	(0.6)	242	(0.9)	264	(0.6)	233	(1.4)	87	(0.3)	13	(0.3)	92	(0.2)	8	(0.2)
Large	16	(0.4)	259	(0.8)	262	(0.8)	241	(1.2)	261	(0.8)	229	(1.8)	86	(0.5)	14	(0.5)	92	(0.4)	8	(0.4)
Midsize	7	(0.4)	261	(1.5)	265	(1.6)	240	(1.7)	264	(1.6)	233	(2.9)	86	(0.9)	14	(0.9)	91	(0.6)	9	(0.6)
Small	8	(0.4)	267	(0.9)	270	(0.9)	247	(1.6)	269	(0.9)	241	(2.7)	89	(0.9)	11	(0.9)	93	(0.5)	7	(0.5)
Suburb	41	(0.4)	269	(0.4)	272	(0.4)	248	(1.0)	271	(0.4)	246	(1.4)	91	(0.3)	9	(0.3)	94	(0.2)	6	(0.2)
Large	35	(0.5)	270	(0.4)	272	(0.4)	248	(1.0)	272	(0.5)	247	(1.4)	92	(0.2)	8	(0.2)	94	(0.2)	6	(0.2)
Midsize	4	(0.3)	265	(1.7)	268	(1.6)	248	(3.2)	267	(1.5)	236	(5.1)	90	(0.8)	10	(0.8)	95	(0.5)	5	(0.5)
Small	2	(0.3)	265	(3.0)	268	(2.6)	248	(3.5)	267	(2.5)	245	(9.5)	87	(2.9)	13	(2.9)	92	(1.3)	8	(1.3)
Town	11	(0.3)	262	(0.7)	265	(0.7)	249	(1.5)	264	(0.7)	248	(1.8)	85	(0.5)	15	(0.5)	90	(0.3)	10	(0.3)
Fringe	3	(0.3)	265	(1.4)	268	(1.3)	248	(3.0)	267	(1.4)	247	(4.1)	88	(0.9)	12	(0.9)	92	(0.6)	8	(0.6)
Distant	5	(0.4)	261	(1.1)	263	(1.1)	249	(2.3)	263	(1.2)	251	(2.4)	85	(0.8)	15	(0.8)	89	(0.6)	11	(0.6)
Remote	3	(0.2)	261	(1.5)	264	(1.5)	248	(2.4)	263	(1.4)	246	(3.7)	83	(0.9)	17	(0.9)	89	(0.8)	11	(0.8)
Rural	18	(0.4)	265	(0.6)	267	(0.6)	251	(1.0)	267	(0.6)	245	(1.3)	87	(0.4)	13	(0.4)	91	(0.4)	9	(0.4)
Fringe	10	(0.5)	266	(0.9)	268	(0.9)	250	(1.6)	268	(0.9)	246	(2.2)	89	(0.6)	11	(0.6)	92	(0.5)	8	(0.5)
Distant	6	(0.3)	264	(0.8)	266	(0.8)	253	(1.4)	266	(0.8)	245	(2.1)	85	(0.6)	15	(0.6)	90	(0.5)	10	(0.5)
Remote	2	(0.1)	262	(1.1)	266	(1.1)	253	(2.2)	265	(1.2)	244	(2.0)	83	(0.9)	17	(0.9)	86	(0.7)	14	(0.7)

†Not applicable.
#Rounds to zero.
‡Reporting standards not met (too few cases for a reliable estimate).
[1]Scale ranges from 0 to 500.
[2]"Access to the Internet" was one item on a list preceded by the question "Do you have the following in your home?" For each item, students could either select "Yes" or leave the item blank. Students who left "Access to the Internet" blank are counted as having no internet access at home.
[3]The student with disability (SD) variable used in this table includes students who have a 504 plan, even if they do not have an Individualized Education Plan (IEP).
[4]Based on a variable that includes five categories: Public, Other private, Catholic, Bureau of Indian Education, and Department of Defense. Bureau of Indian Education and Department of Defense were omitted from this table, and Other private and Catholic were collapsed to create the Private category.
NOTE: Includes students tested with accommodations (13 percent of all 4th-graders and 11 percent of all 8th-graders); excludes only those students with disabilities and English language learners who were unable to be tested even with accommodations (2 percent of all students at both grades). Race categories exclude persons of Hispanic ethnicity. Detail may not sum to totals because of rounding.
SOURCE: U.S. Department of Education, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2015 Reading Assessment, retrieved September 23, 2016, from the Main NAEP Data Explorer (http://nces.ed.gov/nationsreportcard/naepdata/). (This table was prepared September 2016.)

Table 6.1. Percentage distribution of 8th-grade public school students, by number of hours they spend using a laptop or desktop computer for schoolwork on a weekday and selected student and school characteristics: 2015

[Standard errors appear in parentheses]

Selected student or school characteristic	None		Less than 1 hour		1 to 2 hours		2 to 3 hours		More than 3 hours	
1	2		3		4		5		6	
Total	**19.9**	**(0.55)**	**28.6**	**(0.63)**	**29.0**	**(0.63)**	**11.0**	**(0.43)**	**11.5**	**(0.44)**
Sex										
Male	21.4	(0.79)	28.3	(0.87)	28.4	(0.87)	10.5	(0.59)	11.4	(0.61)
Female	18.3	(0.77)	29.0	(0.91)	29.6	(0.91)	11.4	(0.63)	11.6	(0.64)
Race/ethnicity										
White	18.0	(0.79)	34.1	(0.98)	28.8	(0.93)	9.1	(0.59)	9.9	(0.62)
Black	21.6	(1.35)	22.2	(1.36)	27.3	(1.46)	12.8	(1.10)	16.1	(1.21)
Hispanic	23.8	(1.10)	24.2	(1.11)	29.9	(1.18)	11.7	(0.83)	10.4	(0.79)
Asian	10.8	(1.89)	26.8	(2.70)	32.3	(2.86)	16.4	(2.26)	13.8	(2.10)
Pacific Islander	‡	(†)	‡	(†)	‡	(†)	‡	(†)	‡	(†)
American Indian/Alaska Native	‡	(†)	‡	(†)	‡	(†)	‡	(†)	‡	(†)
Two or more races	16.3	(3.26)	29.5	(4.03)	27.9	(3.96)	13.2	(2.99)	13.2	(2.99)
English language learner (ELL) status										
ELL	23.2	(2.24)	22.7	(2.22)	27.7	(2.37)	13.4	(1.81)	12.9	(1.78)
Non-ELL	19.7	(0.57)	29.1	(0.65)	29.1	(0.65)	10.8	(0.45)	11.4	(0.46)
Disability status[1]										
Identified as student with disability (SD)	25.4	(1.88)	25.6	(1.89)	24.4	(1.86)	12.7	(1.44)	11.9	(1.40)
Not identified as SD	19.3	(0.58)	29.0	(0.66)	29.5	(0.67)	10.8	(0.45)	11.4	(0.47)
Eligibility for free or reduced-price lunch										
Eligible	24.5	(0.79)	23.9	(0.79)	28.4	(0.83)	11.3	(0.58)	12.0	(0.60)
Not eligible	13.6	(0.74)	34.4	(1.02)	30.1	(0.98)	10.9	(0.67)	11.0	(0.67)
Information not available	22.6	(4.08)	42.5	(4.82)	24.5	(4.20)	3.8 !	(1.86)	6.6 !	(2.42)
School locale										
City	22.3	(1.12)	25.9	(1.18)	29.5	(1.22)	11.0	(0.84)	11.5	(0.86)
Suburb	18.0	(0.81)	29.0	(0.95)	29.7	(0.96)	11.0	(0.66)	12.4	(0.69)
Town	17.0	(1.65)	29.1	(1.99)	30.5	(2.02)	11.9	(1.42)	11.5	(1.40)
Rural	22.4	(1.30)	31.3	(1.44)	26.1	(1.37)	10.5	(0.96)	9.6	(0.92)

†Not applicable.
!Interpret data with caution. The coefficient of variation (CV) for this estimate is between 30 and 50 percent.
‡Reporting standards not met (too few cases for a reliable estimate).
[1]The student with disability (SD) variable used in this table includes students who have a 504 plan, even if they do not have an Individualized Education Plan (IEP).

NOTE: Race categories exclude persons of Hispanic ethnicity. Detail may not sum to totals because of rounding.
SOURCE: American Institutes for Research, National Assessment of Educational Progress (NAEP) Validity Studies Panel, *Initial Tables From the 2015 Computer Access and Familiarity Study.* (This table was prepared January 2017.)

Table 7.1. Number and percentage of households with computer and internet access, by state: 2015

[Standard errors appear in parentheses]

State	Total number of households		Households with computer (including smart phone)[1]				Households with internet access[2]			
			Number		Percent		Number		Percent	
1	2		3		4		5		6	
United States	**118,208,200**	**(94,360)**	**102,605,600**	**(120,710)**	**86.8**	**(0.04)**	**91,348,800**	**(132,670)**	**77.3**	**(0.06)**
Alabama	1,846,400	(6,890)	1,490,700	(8,680)	80.7	(0.30)	1,268,300	(9,330)	68.7	(0.38)
Alaska	250,200	(1,630)	230,000	(2,460)	91.9	(0.68)	208,300	(2,830)	83.2	(0.97)
Arizona	2,463,000	(7,570)	2,158,600	(8,890)	87.6	(0.24)	1,932,100	(8,930)	78.4	(0.27)
Arkansas	1,144,700	(5,050)	935,500	(5,960)	81.7	(0.35)	745,900	(5,860)	65.2	(0.40)
California	12,896,300	(11,850)	11,577,000	(15,950)	89.8	(0.10)	10,547,100	(19,360)	81.8	(0.13)
Colorado	2,074,700	(4,590)	1,893,200	(6,120)	91.2	(0.23)	1,729,400	(7,040)	83.4	(0.29)
Connecticut	1,343,700	(4,080)	1,187,500	(5,570)	88.4	(0.35)	1,104,500	(6,200)	82.2	(0.39)
Delaware	352,600	(2,380)	308,500	(2,950)	87.5	(0.63)	276,700	(3,270)	78.5	(0.81)
District of Columbia	281,800	(1,840)	251,800	(2,500)	89.4	(0.69)	218,300	(3,050)	77.5	(0.97)
Florida	7,463,200	(14,070)	6,529,200	(16,420)	87.5	(0.13)	5,820,200	(18,450)	78.0	(0.17)
Georgia	3,656,400	(8,770)	3,174,400	(10,500)	86.8	(0.21)	2,757,100	(11,690)	75.4	(0.25)
Hawaii	445,900	(2,930)	397,700	(3,500)	89.2	(0.49)	369,200	(3,640)	82.8	(0.67)
Idaho	597,400	(2,780)	530,800	(4,100)	88.9	(0.56)	461,500	(5,230)	77.3	(0.80)
Illinois	4,794,500	(7,880)	4,141,800	(12,220)	86.4	(0.18)	3,719,000	(13,300)	77.6	(0.22)
Indiana	2,515,100	(7,070)	2,138,500	(9,010)	85.0	(0.25)	1,864,900	(9,390)	74.1	(0.30)
Iowa	1,247,200	(4,130)	1,065,900	(6,620)	85.5	(0.42)	944,300	(7,090)	75.7	(0.51)
Kansas	1,111,600	(3,990)	955,300	(5,920)	85.9	(0.40)	860,200	(6,720)	77.4	(0.48)
Kentucky	1,716,200	(5,380)	1,407,200	(7,680)	82.0	(0.33)	1,231,400	(9,990)	71.8	(0.49)
Louisiana	1,737,900	(5,820)	1,405,400	(8,760)	80.9	(0.35)	1,205,900	(9,020)	69.4	(0.43)
Maine	545,200	(3,240)	471,400	(4,000)	86.5	(0.61)	424,600	(4,420)	77.9	(0.71)
Maryland	2,177,900	(4,740)	1,961,800	(7,110)	90.1	(0.23)	1,791,200	(8,130)	82.2	(0.32)
Massachusetts	2,560,000	(5,580)	2,286,700	(8,300)	89.3	(0.25)	2,133,500	(8,750)	83.3	(0.28)
Michigan	3,858,500	(6,710)	3,324,800	(10,540)	86.2	(0.20)	2,886,800	(12,510)	74.8	(0.29)
Minnesota	2,147,300	(4,850)	1,916,500	(7,210)	89.3	(0.25)	1,720,100	(9,020)	80.1	(0.38)
Mississippi	1,104,400	(4,820)	870,400	(7,350)	78.8	(0.48)	683,400	(7,720)	61.9	(0.57)
Missouri	2,374,200	(6,950)	2,030,600	(8,810)	85.5	(0.27)	1,761,700	(8,790)	74.2	(0.33)
Montana	414,800	(2,280)	354,900	(3,360)	85.6	(0.62)	314,500	(4,160)	75.8	(0.86)
Nebraska	744,200	(2,400)	649,300	(3,450)	87.3	(0.36)	590,900	(4,200)	79.4	(0.52)
Nevada	1,042,100	(4,690)	933,200	(5,420)	89.6	(0.31)	822,000	(6,000)	78.9	(0.47)
New Hampshire	517,600	(2,820)	471,100	(3,580)	91.0	(0.52)	439,700	(3,750)	84.9	(0.61)
New Jersey	3,188,000	(5,620)	2,811,400	(8,740)	88.2	(0.20)	2,619,800	(8,700)	82.2	(0.23)
New Mexico	761,800	(3,530)	614,900	(4,810)	80.7	(0.50)	515,300	(5,820)	67.6	(0.70)
New York	7,233,700	(9,630)	6,251,900	(15,380)	86.4	(0.16)	5,648,800	(15,510)	78.1	(0.18)
North Carolina	3,843,800	(9,140)	3,269,500	(11,700)	85.1	(0.20)	2,862,000	(13,290)	74.5	(0.28)
North Dakota	313,500	(2,180)	271,300	(2,820)	86.5	(0.65)	242,300	(2,990)	77.3	(0.82)
Ohio	4,606,700	(7,650)	3,940,900	(10,710)	85.5	(0.17)	3,531,000	(11,360)	76.7	(0.19)
Oklahoma	1,465,900	(3,930)	1,226,300	(5,660)	83.7	(0.31)	1,047,800	(7,570)	71.5	(0.45)
Oregon	1,553,200	(4,470)	1,411,300	(5,670)	90.9	(0.24)	1,269,200	(6,140)	81.7	(0.33)
Pennsylvania	4,956,000	(7,220)	4,190,700	(12,810)	84.6	(0.20)	3,800,600	(13,550)	76.7	(0.24)
Rhode Island	407,500	(2,460)	354,000	(3,580)	86.9	(0.74)	321,400	(3,830)	78.9	(0.86)
South Carolina	1,857,800	(5,700)	1,549,300	(6,430)	83.4	(0.26)	1,305,600	(7,960)	70.3	(0.39)
South Dakota	339,400	(1,780)	289,900	(3,040)	85.4	(0.76)	258,300	(3,570)	76.1	(0.96)
Tennessee	2,530,300	(6,530)	2,091,900	(10,670)	82.7	(0.29)	1,795,400	(10,630)	71.0	(0.34)
Texas	9,421,400	(12,840)	8,165,200	(16,600)	86.7	(0.11)	7,042,100	(20,350)	74.7	(0.18)
Utah	931,000	(3,100)	866,100	(4,640)	93.0	(0.35)	779,200	(5,430)	83.7	(0.50)
Vermont	254,900	(1,830)	223,900	(2,390)	87.9	(0.73)	207,900	(2,920)	81.6	(0.99)
Virginia	3,106,900	(7,210)	2,741,200	(9,200)	88.2	(0.18)	2,463,400	(11,170)	79.3	(0.27)
Washington	2,728,600	(5,150)	2,493,800	(7,820)	91.4	(0.22)	2,305,800	(9,140)	84.5	(0.29)
West Virginia	734,500	(3,250)	586,700	(4,510)	79.9	(0.47)	517,400	(4,630)	70.4	(0.59)
Wisconsin	2,319,500	(4,290)	2,001,700	(7,490)	86.3	(0.26)	1,806,400	(8,520)	77.9	(0.32)
Wyoming	228,900	(2,230)	204,000	(2,270)	89.1	(0.66)	176,600	(2,820)	77.1	(0.96)

[1]Includes all households whose members own or use at home a desktop, laptop, netbook, or notebook computer; handheld computer, smart mobile phone, or other handheld wireless computer; or some other type of computer.

[2]Includes all households whose members access the Internet at home with a subscription to an internet service—that is, households whose members subscribe to a dial-up, DSL, cable modem, fiber optic, or satellite internet service; a mobile broadband plan for a computer or cell phone; or some other service. Excludes households that reported home internet use without a subscription.

NOTE: Data in this table are from the American Community Survey (ACS) and may differ from those shown in tables based on the Current Population Survey (CPS). Although the ACS conducts sample surveys of the entire population residing within the United States, this table includes only the population living in households; it excludes persons living in institutionalized group quarters (e.g., prisons or nursing facilities) and those living in noninstitutionalized group quarters (e.g., college or military housing). Detail may not sum to totals because of rounding.

SOURCE: U.S. Department of Commerce, Census Bureau, 2015 American Community Survey (ACS) Public Use Microdata Sample (PUMS) data. (This table was prepared October 2016.)

Table 8.1. Average mathematics score and percentage of eighth-graders, by access to the Internet at home, access to a computer or tablet at home or other place outside of school, frequency of computer or tablet use for schoolwork outside of school, and country or other education system: 2015

[Standard errors appear in parentheses]

Country or other education system[1]	Total, all eighth-graders		Access to the Internet at home: Yes, has internet connection at home		Access to the Internet at home: No internet connection at home		Access to a computer or tablet outside of school: Access at home: Yes, has own or shared computer or tablet at home		Access to a computer or tablet outside of school: Access at home: No access to computer or tablet at home		Access to a computer or tablet outside of school: For students with no access at home, access at some other place outside of school: Yes, has access only at some other place[2]		Access to a computer or tablet outside of school: For students with no access at home, access at some other place outside of school: No access outside of school		Frequency of computer or tablet use for schoolwork outside of school: At home: Every day or almost every day		Frequency of computer or tablet use for schoolwork outside of school: At home: Once or twice a week		Frequency of computer or tablet use for schoolwork outside of school: At home: Once or twice a month		Frequency of computer or tablet use for schoolwork outside of school: At home: Never or almost never		Frequency of computer or tablet use for schoolwork outside of school: At some other place than home or school: Every day or almost every day		Frequency of computer or tablet use for schoolwork outside of school: At some other place than home or school: Once or twice a week		Frequency of computer or tablet use for schoolwork outside of school: At some other place than home or school: Once or twice a month		Frequency of computer or tablet use for schoolwork outside of school: At some other place than home or school: Never or almost never	
1	2		3		4		5		6		7		8		9		10		11		12		13		14		15		16	
	Average mathematics score[3]																													
International average[4]	**487**	**(0.6)**	**493**	**(0.6)**	**442**	**(1.7)**	**490**	**(0.6)**	**439**	**(1.6)**	**439**	**(2.5)**	**446**	**(2.2)**	**486**	**(0.7)**	**496**	**(0.7)**	**493**	**(0.9)**	**463**	**(1.1)**	**472**	**(0.8)**	**489**	**(0.7)**	**496**	**(0.7)**	**494**	**(0.7)**
Australia	505	(3.1)	509	(2.9)	445	(6.9)	507	(3.0)	429	(7.9)	418	(9.2)	447	(13.7)	512	(3.3)	512	(3.5)	484	(5.3)	460	(6.0)	491	(4.5)	504	(3.3)	516	(3.8)	514	(3.7)
Bahrain	454	(1.4)	458	(1.5)	400	(8.0)	457	(1.5)	416	(6.4)	413	(8.7)	432	(9.3)	452	(2.1)	465	(2.8)	467	(4.9)	439	(5.2)	439	(2.1)	460	(3.4)	471	(3.5)	468	(3.0)
Canada[5,6,7]	527	(2.2)	529	(2.0)	481	(8.0)	529	(2.0)	492	(9.4)	492	(13.2)	495	(13.9)	530	(2.3)	530	(2.5)	529	(3.5)	506	(4.8)	516	(2.7)	529	(2.9)	532	(2.6)	536	(2.6)
Chile	427 [8]	(3.2)	433	(3.3)	404	(4.8)	430	(3.2)	395	(6.4)	394	(10.2)	399	(9.0)	423	(3.4)	442	(4.1)	438	(5.0)	404	(5.4)	404	(4.1)	429	(4.0)	441	(4.0)	436	(4.2)
Chinese Taipei	599	(2.4)	603	(2.4)	565	(6.0)	602	(2.4)	529	(10.5)	534	(17.7)	524	(12.1)	583	(3.5)	620	(3.2)	618	(3.1)	565	(4.0)	555	(5.5)	598	(4.2)	618	(4.2)	600	(2.5)
Egypt	392 [8]	(4.1)	412	(4.2)	371	(4.9)	402	(3.9)	361	(5.9)	355	(7.1)	380	(5.8)	392	(4.2)	404	(5.4)	411	(6.3)	390	(5.7)	399	(4.5)	398	(4.9)	401	(6.7)	398	(3.9)
England (United Kingdom)	518	(4.2)	520	(4.2)	467	(13.8)	520	(4.2)	468	(15.6)	‡	(†)	‡	(†)	524	(4.6)	525	(5.2)	487	(6.7)	477	(6.6)	500	(5.0)	514	(4.8)	530	(4.6)	526	(5.0)
Georgia[6,9]	453	(3.4)	460	(3.5)	428	(6.1)	459	(3.5)	419	(8.1)	427	(9.1)	437	(12.6)	449	(4.1)	464	(5.1)	477	(5.9)	444	(7.7)	442	(4.8)	459	(4.2)	462	(5.2)	473	(4.6)
Hong Kong (China)	594	(4.6)	597	(4.5)	548	(10.4)	595	(4.5)	555	(11.7)	553	(17.0)	558	(14.0)	597	(6.0)	604	(4.7)	597	(4.4)	564	(6.4)	571	(8.4)	595	(6.0)	601	(5.6)	597	(4.2)
Hungary	514	(3.8)	518	(3.6)	401	(12.0)	517	(3.6)	392	(11.9)	389	(14.4)	415	(16.5)	505	(3.8)	535	(4.5)	531	(5.8)	482	(10.9)	487	(4.8)	506	(4.5)	519	(4.8)	535	(4.5)
Iran, Islamic Republic of	436 [8]	(4.6)	460	(5.7)	407	(3.9)	450	(4.9)	389	(4.9)	398	(5.5)	381	(5.8)	438	(5.7)	452	(5.6)	456	(5.7)	403	(5.4)	418	(5.6)	440	(5.5)	449	(4.6)	435	(5.9)
Ireland	523	(2.7)	524	(2.8)	495	(12.9)	524	(2.7)	500	(12.0)	489	(15.1)	509	(16.4)	512	(3.3)	537	(2.8)	539	(3.5)	518	(5.5)	491	(4.4)	520	(3.7)	528	(3.2)	538	(3.1)
Israel[10]	511	(4.1)	518	(3.9)	428	(10.6)	515	(4.0)	433	(9.1)	439	(15.3)	438	(12.3)	501	(5.9)	528	(4.7)	534	(3.9)	489	(5.8)	485	(6.9)	509	(5.5)	521	(5.0)	524	(4.1)
Italy[9]	494	(2.5)	496	(2.4)	457	(8.0)	495	(2.5)	454	(11.7)	479	(16.9)	444	(16.5)	486	(3.5)	501	(2.9)	509	(3.9)	482	(4.7)	468	(5.4)	492	(3.6)	509	(3.3)	501	(2.9)
Japan	586	(2.3)	590	(2.3)	559	(4.4)	590	(2.3)	554	(4.8)	531	(10.0)	561	(5.4)	565	(3.5)	593	(3.1)	600	(3.1)	584	(3.6)	545	(5.5)	576	(4.3)	587	(4.5)	594	(2.7)
Jordan	386 [11]	(3.2)	399	(3.2)	350	(4.2)	393	(3.3)	343	(4.8)	351	(6.6)	347	(7.4)	391	(3.4)	398	(3.3)	398	(7.8)	360	(6.6)	394	(4.3)	393	(4.6)	399	(4.6)	384	(4.1)
Kazakhstan	528	(5.3)	533	(5.3)	514	(9.3)	531	(5.1)	509	(10.6)	519	(9.6)	504	(12.7)	529	(5.6)	530	(5.8)	536	(6.5)	515	(9.8)	522	(6.9)	527	(6.3)	534	(6.4)	534	(5.8)
Korea, Republic of	606	(2.6)	607	(2.6)	566	(8.8)	607	(2.6)	561	(8.6)	571	(11.6)	555	(11.0)	605	(3.8)	615	(3.1)	610	(3.1)	584	(3.9)	591	(4.9)	603	(4.3)	613	(3.2)	608	(3.0)
Kuwait	392 [8]	(4.6)	395	(5.0)	361	(7.9)	396	(4.9)	345	(6.9)	343	(6.9)	357	(9.9)	391	(5.9)	399	(5.3)	404	(7.3)	370	(7.5)	375	(5.3)	414	(7.1)	411	(6.9)	399	(5.5)
Lebanon	442	(3.6)	449	(3.9)	423	(4.6)	446	(3.7)	411	(6.2)	419	(8.7)	400	(13.0)	446	(4.5)	443	(4.6)	451	(5.7)	424	(8.2)	450	(4.7)	447	(5.1)	448	(5.0)	438	(4.5)
Lithuania[9]	511	(2.8)	515	(2.7)	452	(8.0)	513	(2.7)	444	(9.8)	446	(11.9)	455	(23.2)	515	(3.1)	512	(3.5)	511	(5.2)	484	(8.6)	501	(5.3)	511	(4.5)	515	(3.2)	518	(3.4)
Malaysia	465	(3.6)	481	(3.7)	438	(4.3)	474	(3.5)	427	(4.6)	432	(5.5)	424	(5.4)	477	(3.6)	466	(4.3)	464	(4.5)	428	(4.7)	460	(3.9)	466	(3.7)	476	(4.3)	464	(4.4)
Malta	494	(1.0)	495	(1.0)	400	(18.5)	495	(1.0)	422	(22.1)	‡	(†)	‡	(†)	492	(1.4)	514	(3.3)	502	(4.3)	444	(8.3)	472	(2.8)	495	(2.8)	509	(3.5)	511	(2.4)
Morocco	384 [11]	(2.3)	405	(2.9)	372	(2.0)	393	(2.5)	366	(2.3)	369	(2.9)	369	(3.2)	393	(3.0)	392	(2.9)	386	(3.6)	374	(2.6)	388	(2.8)	394	(3.4)	390	(2.7)	383	(3.0)
New Zealand[7]	493	(3.4)	498	(3.3)	426	(6.5)	495	(3.3)	444	(7.4)	439	(7.1)	460	(11.9)	495	(3.3)	504	(4.7)	482	(5.7)	450	(7.2)	467	(3.8)	494	(3.1)	511	(4.7)	504	(4.8)
Norway[12]	512	(2.3)	512	(2.2)	‡	(†)	512	(2.2)	454	(16.3)	‡	(†)	‡	(†)	509	(3.2)	518	(2.3)	512	(3.6)	485	(7.5)	492	(4.9)	505	(4.3)	514	(2.9)	519	(2.4)
Oman	403 [8]	(2.4)	410	(2.7)	390	(3.7)	409	(2.3)	375	(4.7)	387	(5.8)	377	(5.3)	408	(3.0)	409	(3.1)	404	(4.1)	390	(4.4)	405	(3.6)	419	(3.6)	410	(3.1)	402	(3.4)
Qatar	437 [8]	(3.0)	444	(2.9)	343	(8.9)	441	(2.9)	349	(8.2)	333	(13.4)	367	(10.4)	447	(3.5)	438	(3.5)	430	(5.8)	398	(6.5)	424	(4.3)	443	(4.6)	446	(5.0)	446	(3.5)
Russian Federation	538	(4.7)	539	(4.7)	512	(12.1)	539	(4.5)	516	(18.1)	496	(23.2)	538	(19.8)	537	(5.1)	542	(5.5)	543	(6.5)	531	(10.4)	524	(5.6)	544	(5.7)	549	(6.2)	545	(4.2)
Saudi Arabia	368 [11]	(4.6)	373	(4.5)	326	(7.6)	372	(4.3)	331	(9.8)	330	(10.8)	344	(14.8)	369	(4.8)	373	(5.8)	382	(7.0)	346	(11.4)	366	(4.5)	375	(7.1)	376	(6.3)	374	(5.7)
Singapore[9]	621	(3.2)	624	(3.1)	526	(8.4)	623	(3.1)	539	(9.1)	525	(14.1)	551	(10.3)	624	(3.4)	629	(3.7)	619	(3.4)	593	(5.4)	604	(4.9)	619	(3.9)	624	(4.0)	627	(3.3)
Slovenia	516	(2.1)	517	(2.0)	488	(17.4)	517	(2.0)	496	(10.7)	487	(13.1)	514	(15.2)	508	(2.3)	529	(3.1)	539	(4.3)	518	(6.4)	495	(3.4)	506	(2.7)	521	(2.9)	529	(2.9)
Sweden	501	(2.8)	502	(2.7)	460	(15.7)	501	(2.7)	459	(16.2)	‡	(†)	‡	(†)	496	(4.0)	511	(2.9)	508	(4.5)	472	(5.4)	486	(4.5)	501	(4.1)	512	(3.2)	503	(3.4)
Thailand	431	(4.8)	446	(6.0)	406	(4.2)	439	(5.3)	404	(5.3)	410	(6.1)	399	(5.7)	443	(6.1)	432	(4.8)	426	(6.4)	405	(5.4)	430	(6.4)	441	(5.7)	440	(4.9)	427	(5.0)
Turkey	458	(4.7)	479	(5.1)	426	(4.9)	472	(5.0)	407	(5.3)	417	(6.1)	414	(7.5)	457	(5.2)	474	(5.3)	472	(7.1)	436	(6.6)	460	(5.5)	466	(5.7)	470	(5.4)	464	(6.4)
United Arab Emirates	465	(2.0)	469	(2.0)	402	(3.7)	467	(2.1)	400	(4.7)	399	(5.9)	406	(8.5)	467	(2.1)	473	(3.7)	456	(4.8)	410	(6.3)	441	(2.2)	477	(3.0)	482	(3.5)	480	(2.8)
United States[7]	518	(3.1)	521	(3.1)	471	(5.6)	520	(3.1)	474	(5.7)	475	(8.9)	479	(6.3)	521	(3.7)	526	(3.6)	516	(3.7)	495	(3.8)	505	(3.4)	518	(3.2)	527	(3.9)	524	(3.4)

See notes at end of table.

Table 8.1. Average mathematics score and percentage of eighth-graders, by access to the Internet at home, access to a computer or tablet at home or other place outside of school, frequency of computer or tablet use for schoolwork outside of school, and country or other education system: 2015—Continued

[Standard errors appear in parentheses]

Country or other education system[1]	Total, all eighth-graders	Access to the Internet at home		Access to a computer or tablet outside of school				Frequency of computer or tablet use for schoolwork outside of school							
				Access at home		For students with no access at home, access at some other place outside of school		At home				At some other place than home or school			
		Yes, has internet connection at home	No internet connection at home	Yes, has own or shared computer or tablet at home	No access to computer or tablet at home	Yes, has access only at some other place[2]	No access outside of school	Every day or almost every day	Once or twice a week	Once or twice a month	Never or almost never	Every day or almost every day	Once or twice a week	Once or twice a month	Never or almost never
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Benchmarking education systems															
Abu Dhabi (United Arab Emirates)	442 (4.7)	446 (4.8)	373 (7.3)	444 (4.8)	383 (9.0)	390 (10.6)	377 (14.7)	443 (4.7)	455 (8.8)	434 (9.0)	386 (8.8)	424 (3.8)	453 (7.2)	461 (7.6)	453 (7.0)
Buenos Aires[7] (Argentina)	396 [11] (4.2)	400 (4.3)	350 (8.6)	397 (4.5)	340 (13.9)	‡ (†)	344 (26.2)	392 (4.9)	406 (5.2)	419 (7.1)	363 (9.2)	381 (6.5)	403 (6.6)	417 (6.4)	403 (4.9)
Dubai (United Arab Emirates)	512 (2.1)	513 (2.0)	456 (9.3)	513 (2.1)	427 (11.4)	416 (12.5)	443 (20.0)	515 (2.5)	510 (3.5)	501 (6.2)	460 (10.4)	483 (3.2)	521 (3.2)	523 (4.0)	525 (4.1)
Florida[6,13] (United States)	493 (6.4)	496 (6.5)	456 (9.3)	496 (6.4)	438 (12.5)	‡ (†)	449 (15.8)	500 (7.3)	493 (7.3)	482 (9.5)	477 (8.4)	487 (8.9)	494 (7.0)	505 (8.0)	496 (6.4)
Ontario (Canada)	522 (2.9)	525 (2.6)	466 (9.7)	524 (2.6)	462 (10.9)	‡ (†)	‡ (†)	526 (3.0)	526 (3.2)	516 (4.4)	491 (6.3)	512 (3.9)	523 (4.0)	527 (3.3)	530 (3.5)
Quebec[14] (Canada)	543 (3.9)	545 (3.5)	529 (12.9)	545 (3.4)	534 (14.2)	‡ (†)	553 (14.7)	544 (3.4)	551 (4.3)	554 (6.2)	527 (8.6)	528 (3.0)	548 (4.1)	558 (4.7)	552 (3.8)
	Percent of students														
International average[4]	**100.0 (†)**	**86.6 (0.12)**	**13.4 (0.12)**	**92.4 (0.10)**	**7.6 (0.10)**	**47.3 (0.85)**	**52.7 (0.85)**	**48.5 (0.18)**	**27.5 (0.13)**	**13.1 (0.11)**	**10.9 (0.12)**	**20.2 (0.13)**	**20.3 (0.12)**	**20.2 (0.12)**	**39.2 (0.16)**
Australia	100.0 (†)	95.1 (0.36)	4.9 (0.36)	98.3 (0.17)	1.7 (0.17)	50.4 (5.97)	49.6 (5.97)	59.1 (1.16)	27.4 (0.82)	8.4 (0.52)	5.1 (0.38)	16.5 (0.73)	26.2 (0.67)	22.2 (0.60)	35.0 (0.77)
Bahrain	100.0 (†)	95.3 (0.32)	4.7 (0.32)	94.3 (0.38)	5.7 (0.38)	55.8 (3.41)	44.2 (3.41)	59.4 (1.03)	24.1 (0.73)	10.4 (0.68)	6.2 (0.40)	35.3 (0.89)	21.9 (0.60)	18.3 (0.60)	24.4 (0.80)
Canada[5,6,7]	100.0 (†)	98.2 (0.22)	1.8 (0.22)	98.4 (0.17)	1.6 (0.17)	42.7 (6.16)	57.3 (6.16)	59.4 (1.02)	23.9 (0.74)	10.1 (0.62)	6.6 (0.40)	21.4 (0.73)	22.3 (0.72)	17.9 (0.54)	38.4 (0.99)
Chile	100.0 (†)	82.9 (0.89)	17.1 (0.89)	95.2 (0.39)	4.8 (0.39)	54.0 (3.65)	46.0 (3.65)	48.5 (0.92)	28.9 (0.82)	12.3 (0.51)	10.3 (0.68)	19.6 (0.81)	20.9 (0.76)	20.7 (0.61)	38.7 (0.79)
Chinese Taipei	100.0 (†)	90.4 (0.48)	9.6 (0.48)	96.7 (0.27)	3.3 (0.27)	33.7 (3.42)	66.3 (3.42)	23.4 (0.69)	26.4 (0.75)	29.3 (0.83)	20.9 (0.84)	8.1 (0.40)	10.8 (0.49)	18.8 (0.60)	62.3 (0.69)
Egypt	100.0 (†)	58.1 (1.18)	41.9 (1.18)	79.1 (1.01)	20.9 (1.01)	46.7 (2.06)	53.3 (2.06)	47.9 (1.01)	25.0 (0.69)	8.4 (0.45)	18.8 (0.93)	22.0 (0.78)	19.7 (0.81)	19.6 (0.75)	38.7 (1.21)
England (United Kingdom)	100.0 (†)	98.9 (0.21)	1.1 (0.21)	99.3 (0.14)	0.7 (0.14)	‡ (†)	66.5 (9.66)	60.0 (1.10)	29.1 (1.00)	6.9 (0.48)	4.0 (0.32)	14.0 (0.67)	22.2 (0.77)	23.0 (0.73)	40.7 (0.93)
Georgia[6,9]	100.0 (†)	81.6 (1.28)	18.4 (1.28)	87.1 (1.16)	12.9 (1.16)	65.5 (3.58)	34.5 (3.58)	53.4 (1.13)	24.8 (0.90)	11.8 (0.70)	10.0 (0.86)	24.4 (0.88)	23.2 (1.00)	20.4 (0.81)	32.1 (1.11)
Hong Kong (China)	100.0 (†)	95.9 (0.40)	4.1 (0.40)	97.6 (0.30)	2.4 (0.30)	30.7 (4.97)	69.3 (4.97)	41.0 (1.26)	25.8 (0.93)	19.6 (0.98)	13.6 (0.94)	10.6 (0.56)	12.2 (0.56)	16.2 (0.57)	61.1 (0.98)
Hungary	100.0 (†)	96.9 (0.42)	3.1 (0.42)	97.5 (0.37)	2.5 (0.37)	58.1 (6.49)	41.9 (6.49)	53.1 (1.13)	25.8 (0.73)	15.0 (0.69)	6.1 (0.67)	18.6 (0.82)	18.7 (0.71)	21.2 (0.63)	41.5 (1.01)
Iran, Islamic Republic of	100.0 (†)	56.9 (1.33)	43.1 (1.33)	78.3 (1.19)	21.7 (1.19)	50.6 (2.41)	49.4 (2.41)	36.2 (1.04)	28.1 (0.84)	14.7 (0.56)	21.0 (1.20)	12.4 (0.74)	21.6 (0.83)	30.4 (0.77)	35.6 (1.31)
Ireland	100.0 (†)	98.3 (0.22)	1.7 (0.22)	98.0 (0.35)	2.0 (0.35)	42.8 (6.16)	57.2 (6.16)	46.0 (1.32)	28.6 (1.00)	15.7 (0.74)	9.7 (0.59)	16.3 (0.64)	17.9 (0.75)	17.2 (0.64)	48.6 (0.87)
Israel[10]	100.0 (†)	93.7 (0.53)	6.3 (0.53)	96.3 (0.31)	3.7 (0.31)	40.8 (4.36)	59.2 (4.36)	41.6 (0.89)	24.6 (0.73)	20.9 (0.64)	12.9 (0.61)	18.5 (0.70)	15.8 (0.54)	19.0 (0.58)	46.7 (0.94)
Italy[9]	100.0 (†)	95.3 (0.38)	4.7 (0.38)	98.1 (0.27)	1.9 (0.27)	38.7 (5.88)	61.3 (5.88)	35.0 (1.16)	36.0 (0.93)	16.6 (0.78)	12.4 (0.73)	14.3 (0.69)	19.6 (0.71)	19.9 (0.72)	46.2 (0.96)
Japan	100.0 (†)	88.6 (0.55)	11.4 (0.55)	90.2 (0.56)	9.8 (0.56)	20.3 (2.16)	79.7 (2.16)	20.2 (0.79)	22.8 (0.76)	26.9 (0.58)	30.2 (0.99)	8.2 (0.51)	10.6 (0.52)	13.4 (0.57)	67.9 (1.07)
Jordan	100.0 (†)	76.0 (1.01)	24.0 (1.01)	86.9 (0.77)	13.1 (0.77)	43.5 (2.60)	56.5 (2.60)	56.1 (1.01)	24.3 (0.60)	8.2 (0.36)	11.4 (0.77)	26.6 (0.74)	20.4 (0.57)	21.9 (0.60)	31.2 (0.96)
Kazakhstan	100.0 (†)	75.7 (1.52)	24.3 (1.52)	85.8 (1.00)	14.2 (1.00)	56.3 (2.34)	43.7 (2.34)	42.2 (1.24)	32.8 (0.93)	12.1 (0.63)	12.9 (0.82)	21.7 (1.05)	20.2 (0.79)	23.6 (0.99)	34.6 (1.27)
Korea, Republic of	100.0 (†)	97.2 (0.28)	2.8 (0.28)	97.1 (0.26)	2.9 (0.26)	47.4 (4.62)	52.6 (4.62)	25.8 (0.76)	30.9 (0.91)	25.5 (0.76)	17.8 (0.77)	12.0 (0.50)	17.8 (0.60)	19.7 (0.60)	50.6 (0.78)
Kuwait	100.0 (†)	93.2 (0.61)	6.8 (0.61)	92.9 (0.56)	7.1 (0.56)	65.7 (2.91)	34.3 (2.91)	56.3 (1.33)	27.4 (0.83)	9.7 (0.79)	6.6 (0.61)	38.4 (1.50)	21.2 (0.89)	13.1 (0.69)	27.4 (1.41)
Lebanon	100.0 (†)	78.5 (0.94)	21.5 (0.94)	92.5 (0.65)	7.5 (0.65)	60.6 (4.77)	39.4 (4.77)	55.7 (1.49)	24.6 (1.00)	11.8 (0.97)	7.9 (1.07)	32.3 (1.24)	21.0 (0.87)	19.8 (1.03)	26.9 (1.20)
Lithuania[9]	100.0 (†)	94.9 (0.53)	5.1 (0.53)	97.6 (0.27)	2.4 (0.27)	63.4 (7.19)	36.6 (7.19)	55.1 (1.16)	28.0 (0.94)	10.8 (0.62)	6.2 (0.52)	13.2 (0.75)	18.0 (0.66)	23.4 (0.93)	45.5 (1.09)
Malaysia	100.0 (†)	64.8 (1.20)	35.2 (1.20)	82.3 (0.83)	17.7 (0.83)	57.8 (1.57)	42.2 (1.57)	47.9 (0.98)	26.2 (0.63)	12.8 (0.39)	13.1 (0.69)	23.7 (0.69)	22.4 (0.66)	24.3 (0.64)	29.5 (0.89)
Malta	100.0 (†)	99.0 (0.14)	1.0 (0.14)	99.2 (0.16)	0.8 (0.16)	‡ (†)	66.4 (10.45)	67.9 (0.78)	20.8 (0.70)	8.0 (0.38)	3.3 (0.26)	25.0 (0.64)	24.4 (0.61)	19.2 (0.57)	31.4 (0.75)
Morocco	100.0 (†)	43.9 (0.84)	56.1 (0.84)	69.8 (0.84)	30.2 (0.84)	48.5 (1.53)	51.5 (1.53)	37.1 (1.00)	26.2 (0.59)	9.7 (0.38)	27.1 (1.09)	21.6 (0.68)	24.4 (0.65)	21.6 (0.52)	32.4 (0.94)
New Zealand[7]	100.0 (†)	93.0 (0.38)	7.0 (0.38)	96.5 (0.22)	3.5 (0.22)	60.0 (2.91)	40.0 (2.91)	63.4 (0.95)	23.5 (0.74)	7.9 (0.52)	5.2 (0.38)	20.0 (0.70)	29.8 (0.97)	22.8 (0.81)	27.4 (0.91)
Norway[12]	100.0 (†)	99.4 (0.09)	0.6 (0.09)	99.1 (0.16)	0.9 (0.16)	38.8 (9.41)	61.2 (9.41)	37.9 (1.60)	40.6 (0.91)	17.0 (1.07)	4.4 (0.57)	10.0 (0.72)	18.6 (0.73)	27.0 (0.84)	44.3 (1.00)
Oman	100.0 (†)	71.4 (1.03)	28.6 (1.03)	85.3 (0.65)	14.7 (0.65)	42.8 (1.60)	57.2 (1.60)	40.8 (1.04)	32.9 (0.86)	12.3 (0.44)	14.1 (0.58)	22.3 (0.74)	20.8 (0.46)	22.1 (0.62)	34.8 (0.88)
Qatar	100.0 (†)	94.6 (0.47)	5.4 (0.47)	96.4 (0.28)	3.6 (0.28)	38.4 (3.92)	61.6 (3.92)	51.6 (1.04)	29.5 (0.64)	12.8 (0.59)	6.1 (0.45)	22.3 (0.68)	21.1 (0.73)	19.7 (0.74)	36.8 (1.04)
Russian Federation	100.0 (†)	96.2 (0.44)	3.8 (0.44)	97.5 (0.26)	2.5 (0.26)	48.3 (5.61)	51.7 (5.61)	67.9 (0.82)	21.0 (0.73)	6.4 (0.44)	4.8 (0.44)	29.8 (0.93)	19.6 (0.70)	14.8 (0.80)	35.8 (0.96)
Saudi Arabia	100.0 (†)	91.0 (0.69)	9.0 (0.69)	91.1 (0.71)	8.9 (0.71)	45.8 (4.45)	54.2 (4.45)	53.2 (1.27)	26.7 (0.99)	12.1 (0.54)	8.0 (0.73)	28.5 (1.04)	17.4 (0.76)	17.7 (0.91)	36.4 (1.28)

See notes at end of table.

Table 8.1. Average mathematics score and percentage of eighth-graders, by access to the Internet at home, access to a computer or tablet at home or other place outside of school, frequency of computer or tablet use for schoolwork outside of school, and country or other education system: 2015—Continued

[Standard errors appear in parentheses]

Country or other education system[1]	Total, all eighth-graders	Access to the Internet at home		Access to a computer or tablet outside of school				Frequency of computer or tablet use for schoolwork outside of school							
				Access at home		For students with no access at home, access at some other place outside of school		At home				At some other place than home or school			
		Yes, has internet connection at home	No internet connection at home	Yes, has own or shared computer or tablet at home	No access to computer or tablet at home	Yes, has access only at some other place[2]	No access outside of school	Every day or almost every day	Once or twice a week	Once or twice a month	Never or almost never	Every day or almost every day	Once or twice a week	Once or twice a month	Never or almost never
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Singapore[9]	100.0 (†)	97.5 (0.23)	2.5 (0.23)	97.3 (0.27)	2.7 (0.27)	36.9 (4.14)	63.1 (4.14)	41.7 (0.69)	27.6 (0.67)	21.2 (0.56)	9.5 (0.44)	14.4 (0.51)	15.2 (0.47)	18.9 (0.55)	51.4 (0.73)
Slovenia	100.0 (†)	99.0 (0.18)	1.0 (0.18)	98.2 (0.23)	1.8 (0.23)	50.5 (5.80)	49.5 (5.80)	61.6 (1.11)	25.1 (0.87)	10.1 (0.55)	3.3 (0.28)	15.3 (0.66)	21.2 (0.87)	21.5 (0.70)	42.0 (0.97)
Sweden	100.0 (†)	98.9 (0.18)	1.1 (0.18)	99.2 (0.17)	0.8 (0.17)	‡ (†)	52.9 (10.73)	43.0 (1.99)	36.4 (0.96)	13.8 (1.07)	6.8 (0.73)	16.1 (0.92)	20.5 (0.74)	23.3 (0.87)	40.0 (1.34)
Thailand	100.0 (†)	64.0 (1.37)	36.0 (1.37)	79.3 (1.02)	20.7 (1.02)	54.7 (2.49)	45.3 (2.49)	48.2 (1.13)	27.5 (0.74)	8.8 (0.46)	15.6 (0.81)	20.0 (0.69)	25.2 (0.77)	19.6 (0.81)	35.2 (1.00)
Turkey	100.0 (†)	61.1 (1.41)	38.9 (1.41)	78.3 (1.40)	21.7 (1.40)	50.6 (2.18)	49.4 (2.18)	35.3 (0.86)	36.1 (1.01)	11.8 (0.49)	16.8 (0.97)	19.8 (1.01)	26.9 (0.85)	19.8 (0.74)	33.5 (1.05)
United Arab Emirates	100.0 (†)	94.9 (0.24)	5.1 (0.24)	97.2 (0.17)	2.8 (0.17)	56.4 (2.93)	43.6 (2.93)	70.8 (0.70)	21.9 (0.61)	4.0 (0.19)	3.3 (0.18)	33.4 (0.56)	23.9 (0.43)	17.2 (0.43)	25.4 (0.51)
United States[7]	100.0 (†)	95.0 (0.29)	5.0 (0.29)	96.6 (0.22)	3.4 (0.22)	39.7 (2.45)	60.3 (2.45)	51.0 (1.04)	26.4 (0.68)	12.1 (0.55)	10.5 (0.56)	22.0 (0.57)	18.2 (0.38)	18.2 (0.50)	41.6 (0.86)
Benchmarking education systems															
Abu Dhabi (United Arab Emirates)	100.0 (†)	95.2 (0.41)	4.8 (0.41)	96.9 (0.37)	3.1 (0.37)	53.8 (4.48)	46.2 (4.48)	71.9 (1.48)	20.2 (1.20)	3.9 (0.41)	3.9 (0.36)	36.6 (1.15)	23.8 (0.84)	16.0 (0.71)	23.6 (1.10)
Buenos Aires[7] (Argentina)	100.0 (†)	90.4 (0.75)	9.6 (0.75)	96.2 (0.47)	3.8 (0.47)	45.2 (5.39)	54.8 (5.39)	50.0 (1.38)	28.6 (1.00)	11.9 (0.85)	9.5 (0.76)	16.4 (0.89)	17.1 (0.74)	19.6 (0.85)	47.0 (1.07)
Dubai (United Arab Emirates)	100.0 (†)	97.5 (0.23)	2.5 (0.23)	98.9 (0.15)	1.1 (0.15)	60.4 (7.06)	39.6 (7.06)	72.7 (0.74)	22.2 (0.68)	3.4 (0.24)	1.6 (0.20)	25.8 (0.71)	26.2 (0.58)	20.1 (0.66)	27.9 (0.92)
Florida[6,13] (United States)	100.0 (†)	95.7 (0.68)	4.3 (0.68)	96.8 (0.53)	3.2 (0.53)	41.6 (5.58)	58.4 (5.58)	58.6 (2.38)	22.1 (1.19)	11.0 (0.93)	8.2 (0.87)	24.3 (1.41)	18.6 (0.70)	18.2 (0.96)	38.9 (1.18)
Ontario (Canada)	100.0 (†)	98.1 (0.28)	1.9 (0.28)	98.7 (0.22)	1.3 (0.22)	53.7 (8.84)	46.3 (8.84)	61.9 (1.39)	24.1 (1.04)	8.7 (0.66)	5.4 (0.53)	21.7 (1.04)	23.2 (0.93)	19.1 (0.67)	35.9 (1.29)
Quebec[14] (Canada)	100.0 (†)	98.7 (0.21)	1.3 (0.21)	98.3 (0.31)	1.7 (0.31)	39.9 (7.89)	60.1 (7.89)	58.8 (1.35)	21.5 (1.16)	12.0 (1.02)	7.7 (0.72)	22.1 (0.91)	21.1 (1.02)	14.7 (1.04)	42.1 (1.32)

†Not applicable.
‡Reporting standards not met. Either there are too few cases for a reliable estimate or the coefficient of variation (CV) is 50 percent or greater.
[1]Most of the education systems represent complete countries, but some represent subnational entities; examples include two Canadian provinces (Ontario and Quebec), a component of the United Kingdom (England), the U.S. state of Florida, and a few individual cities (such as Abu Dhabi within the United Arab Emirates).
[2]Students were asked how often they used a computer or tablet to do schoolwork "(including classroom tasks, homework, studying outside of class)" in each of the following three places: "at home," "at school," and "some other place." The frequency choices were "Every day or almost every day," "Once or twice a week," "Once or twice a month," and "Never or almost never." If students had no access to a computer or tablet at home, and their frequency at "some other place" was at least "once or twice a month," they are classified as having access to a computer or tablet outside of school only at some other place.
[3]Trends in International Mathematics and Science Study (TIMSS) scores are reported on a scale from 0 to 1,000, with the scale centerpoint set at 500 and the standard deviation set at 100.
[4]The international average includes only education systems that are members of the International Association for the Evaluation of Educational Achievement (IEA), which develops and implements TIMSS at the international level. "Benchmarking" education systems are not members of the IEA and are therefore not included in the average.
[5]Data for Canada include only students from the provinces of Manitoba, Newfoundland, Ontario, and Quebec.
[6]National Target Population does not include all of the International Target Population.
[7]Met guidelines for sample participation rates only after replacement schools were included.
[8]The TIMSS & PIRLS International Study Center has reservations about the reliability of the average achievement score because the percentage of students with achievement too low for estimation exceeds 15 percent, though it is less than 25 percent.
[9]National Defined Population covers 90 to 95 percent of National Target Population.
[10]National Defined Population covers less than 90 percent of the National Target Population (but at least 77 percent).
[11]The TIMSS & PIRLS International Study Center has reservations about the reliability of the average achievement score because the percentage of students with achievement too low for estimation exceeds 25 percent.
[12]Norway collected data from students in their ninth year of schooling rather than in grade 8 because year 1 in Norway is considered the equivalent of kindergarten rather than the first year of primary school.
[13]U.S. state-level data are based on public school students only.
[14]Did not satisfy guidelines for sample participation rates.
NOTE: Countries and other education systems were required to draw probability samples of students who were nearing the end of their eighth year of formal schooling (counting the first year of primary school as year 1), provided that the mean age at the time of testing was at least 13.5 years. Detail may not sum to totals because of rounding.
SOURCE: International Association for the Evaluation of Educational Achievement (IEA), Trends in International Mathematics and Science Study (TIMSS), 2015. (This table was prepared January 2017.)

Table 8.2. Average mathematics score and percentage of eighth-graders, by mathematics teachers' reports of student access to computers and frequency of computer use during mathematics lessons and country or other education system: 2015

[Standard errors appear in parentheses]

Country or other education system[1]	Total, all eighth-graders		Student access to computers (including tablets) to use during mathematics lessons								Among students who have computers (including tablets) available, frequency of computer use during mathematics lessons[2]							
			No computers are available to students during lessons		Computers are available to students during lessons						Every day or almost every day		Once or twice a week		Once or twice a month		Never or almost never	
					Total, all students who have computers available[3]		Each student has a computer		Class has computers that students can share		School has computers that the class can use sometimes							
1	2		3		4		5		6		7		8		9		10		11	
	Average mathematics score[4]																			
International average[5]	**487**	**(0.6)**	**486**	**(0.7)**	**490**	**(1.3)**	**499**	**(3.0)**	**494**	**(3.4)**	**486**	**(1.9)**	**489**	**(3.4)**	**484**	**(3.7)**	**491**	**(2.0)**	**489**	**(4.8)**
Australia	505	(3.1)	506	(5.4)	512	(3.5)	522	(3.8)	490	(10.9)	500	(9.2)	509	(10.8)	510	(5.9)	518	(7.4)	495	(16.3)
Bahrain	454	(1.4)	452	(2.2)	458	(3.8)	482	(21.3)	462	(17.6)	455	(4.3)	473	(12.2)	448	(5.2)	454	(7.1)	562	(67.9)
Canada[6,7,8]	527	(2.2)	533	(3.2)	528	(3.7)	539	(7.5)	523	(5.8)	526	(6.1)	535	(9.6)	527	(7.5)	525	(4.7)	526	(8.4)
Chile	427 [9]	(3.2)	437	(5.8)	423	(5.5)	419	(11.4)	412	(10.0)	444	(9.9)	428	(17.9)	397	(24.9)	417	(6.8)	468	(16.8)
Chinese Taipei	599	(2.4)	597	(2.9)	604	(6.8)	545	(8.4)	616	(7.7)	581	(11.4)	590	(26.3)	624	(88.8)	612	(9.3)	597	(10.4)
Egypt	392 [9]	(4.1)	390	(5.8)	395	(6.1)	408	(46.9)	402	(20.9)	392	(5.3)	397	(15.0)	397	(11.5)	388	(7.1)	438	(15.0)
England (United Kingdom)	518	(4.2)	520	(6.0)	511	(9.7)	514	(14.9)	507	(56.1)	509	(13.8)	532	(31.7)	493	(14.0)	504	(15.4)	529	(24.2)
Georgia[7,10]	453	(3.4)	452	(4.5)	453	(6.6)	464	(11.9)	414	(13.8)	456	(8.2)	439	(17.4)	453	(12.7)	458	(8.7)	452	(26.8)
Hong Kong (China)	594	(4.6)	596	(5.5)	591	(10.7)	593	(25.2)	586	(15.8)	597	(21.3)	584	(43.2)	587	(23.1)	594	(17.0)	597	(21.8)
Hungary	514	(3.8)	516	(4.6)	509	(8.0)	509	(14.4)	529	(19.3)	503	(9.4)	498	(15.1)	510	(15.6)	517	(16.4)	454	(49.8)
Iran, Islamic Republic of	436 [9]	(4.6)	429	(5.1)	457	(8.6)	508	(32.1)	488	(17.2)	452	(10.7)	543	(44.0)	460	(14.3)	453	(13.6)	434	(25.0)
Ireland	523	(2.7)	525	(3.4)	515	(6.2)	527	(7.3)	512	(21.3)	509	(8.5)	500	(22.4)	508	(15.6)	519	(12.3)	517	(9.8)
Israel[11]	511	(4.1)	508	(4.3)	536	(11.8)	569	(16.8)	537	(34.9)	508	(16.0)	542	(21.6)	525	(30.6)	550	(19.8)	500	(18.7)
Italy[10]	494	(2.5)	495	(4.1)	493	(4.3)	503	(12.6)	489	(6.4)	499	(7.0)	499	(10.8)	480	(15.0)	496	(5.8)	501	(10.6)
Japan	586	(2.3)	588	(3.4)	585	(4.1)	588	(9.4)	590	(7.6)	584	(5.5)	543	(2.5)	‡	(†)	581	(7.9)	588	(4.7)
Jordan	386 [12]	(3.2)	378	(4.0)	394	(6.5)	410	(11.4)	385	(16.4)	394	(7.9)	399	(22.1)	391	(11.4)	396	(10.7)	381	(15.5)
Kazakhstan	528	(5.3)	525	(7.4)	531	(7.6)	531	(12.9)	531	(11.3)	514	(17.7)	533	(13.3)	523	(11.2)	542	(14.8)	‡	(†)
Korea, Republic of	606	(2.6)	607	(3.6)	604	(4.3)	607	(14.9)	605	(5.6)	600	(11.1)	617	(8.8)	591	(8.5)	601	(7.7)	612	(9.2)
Kuwait	392 [9]	(4.6)	393	(4.2)	393	(16.7)	391	(43.3)	402	(24.9)	395	(10.1)	392	(31.8)	393	(11.8)	396	(14.7)	394	(32.3)
Lebanon	442	(3.6)	442	(3.9)	451	(11.8)	482	(23.5)	‡	(†)	437	(10.6)	470	(18.9)	448	(17.1)	451	(28.9)	419	(12.3)
Lithuania[10]	511	(2.8)	512	(4.5)	508	(4.9)	463	(12.7)	495	(8.1)	516	(5.8)	500	(11.7)	515	(21.7)	511	(6.5)	499	(12.2)
Malaysia	465	(3.6)	465	(4.6)	477	(11.7)	508	(21.4)	507	(53.5)	476	(16.3)	‡	(†)	545	(18.2)	480	(14.1)	443	(22.1)
Malta	494	(1.0)	495	(1.1)	470	(5.4)	‡	(†)	565	(7.3)	424	(7.7)	‡	(†)	‡	(†)	506	(5.4)	466	(10.1)
Morocco	384 [12]	(2.3)	382	(2.6)	400	(6.9)	508	(33.9)	441	(18.3)	402	(7.3)	417	(20.2)	475	(19.5)	396	(10.4)	379	(8.9)
New Zealand[8]	493	(3.4)	488	(5.7)	501	(4.8)	511	(10.0)	496	(11.9)	493	(8.9)	493	(11.2)	490	(8.5)	502	(9.1)	535	(14.2)
Norway[13]	512	(2.3)	513	(3.2)	513	(3.5)	508	(4.3)	517	(5.6)	517	(6.2)	539	(2.3)	510	(8.6)	514	(3.4)	514	(15.5)
Oman	403 [9]	(2.4)	404	(3.1)	403	(9.9)	411	(8.8)	371	(23.4)	415	(14.3)	425	(8.9)	398	(21.3)	399	(11.5)	‡	(†)
Qatar	437 [9]	(3.0)	445	(4.3)	422	(6.6)	418	(8.5)	470	(34.3)	404	(12.0)	413	(13.1)	425	(13.6)	426	(17.4)	401	(75.7)
Russian Federation	538	(4.7)	540	(6.4)	535	(5.1)	539	(12.8)	545	(10.2)	530	(8.0)	542	(13.5)	548	(8.0)	521	(8.5)	461	(18.8)
Saudi Arabia	368 [12]	(4.6)	361	(4.6)	396	(12.7)	375	(23.2)	418	(20.2)	391	(24.1)	355	(11.0)	414	(21.1)	379	(9.5)	‡	(†)
Singapore[10]	621	(3.2)	621	(4.1)	617	(6.0)	634	(8.6)	584	(27.7)	609	(9.6)	639	(19.3)	609	(19.7)	619	(8.1)	607	(14.9)
Slovenia	516	(2.1)	516	(2.1)	517	(6.7)	509	(7.6)	518	(19.8)	520	(9.1)	‡	(†)	508	(24.2)	516	(8.2)	528	(10.0)
Sweden	501	(2.8)	502	(4.0)	499	(4.0)	498	(5.1)	486	(11.0)	510	(7.9)	491	(9.8)	478	(8.7)	501	(5.7)	510	(6.7)
Thailand	431	(4.8)	425	(6.1)	442	(8.5)	453	(12.0)	417	(15.5)	453	(21.0)	454	(39.3)	432	(14.3)	452	(12.2)	433	(16.0)
Turkey	458	(4.7)	456	(5.0)	471	(13.2)	515	(4.9)	508	(25.7)	443	(16.0)	501	(25.5)	470	(12.4)	466	(21.3)	405	(85.8)
United Arab Emirates	465	(2.0)	456	(3.8)	481	(4.5)	470	(6.2)	493	(10.0)	503	(12.3)	477	(7.1)	475	(8.0)	498	(12.1)	473	(10.3)
United States[8]	518	(3.1)	518	(4.3)	519	(5.0)	526	(9.7)	514	(6.8)	514	(10.8)	509	(11.7)	515	(9.7)	528	(9.6)	537	(16.5)

See notes at end of table.

Table 8.2. Average mathematics score and percentage of eighth-graders, by mathematics teachers' reports of student access to computers and frequency of computer use during mathematics lessons and country or other education system: 2015—Continued

[Standard errors appear in parentheses]

Country or other education system[1]	Total, all eighth-graders		Student access to computers (including tablets) to use during mathematics lessons: No computers are available to students during lessons		Computers are available to students during lessons: Total, all students who have computers available[3]		Each student has a computer		Class has computers that students can share		School has computers that the class can use sometimes		Among students who have computers (including tablets) available, frequency of computer use during mathematics lessons[2]: Every day or almost every day		Once or twice a week		Once or twice a month		Never or almost never	
1	2		3		4		5		6		7		8		9		10		11	
Benchmarking education systems																				
Abu Dhabi (United Arab Emirates)	442	(4.7)	431	(8.0)	468	(14.6)	510	(27.9)	426	(10.1)	474	(26.2)	477	(25.7)	449	(26.8)	468	(24.3)	522	(45.1)
Buenos Aires[8] (Argentina)	396 [12]	(4.2)	414	(15.7)	371	(8.1)	373	(9.7)	371	(31.9)	371	(26.2)	419	(28.3)	381	(34.9)	368	(8.3)	330	(20.9)
Dubai (United Arab Emirates)	512	(2.1)	499	(3.8)	524	(3.8)	513	(6.5)	540	(9.0)	529	(8.1)	524	(6.7)	512	(6.7)	551	(8.9)	474	(22.7)
Florida[7,14] (United States)	493	(6.4)	513	(8.3)	483	(15.9)	492	(46.3)	481	(18.5)	481	(15.8)	491	(21.1)	480	(33.2)	476	(28.4)	‡	(†)
Ontario (Canada)	522	(2.9)	519	(4.3)	527	(4.7)	532	(13.6)	523	(6.0)	531	(7.5)	525	(13.5)	528	(8.1)	526	(5.6)	529	(9.6)
Quebec[15] (Canada)	543	(3.9)	548	(3.8)	556	(6.2)	554	(6.9)	532	(15.7)	564	(15.4)	562	(4.3)	542	(11.1)	551	(16.2)	559	(15.0)
	Percent of students																			
International average[5]	**100.0**	**(†)**	**67.2**	**(0.53)**	**32.8**	**(0.53)**	**9.8**	**(0.35)**	**8.2**	**(0.32)**	**13.5**	**(0.41)**	**16.6**	**(0.87)**	**25.8**	**(0.91)**	**42.0**	**(1.09)**	**15.6**	**(0.79)**
Australia	100.0	(†)	38.1	(3.43)	61.9	(3.43)	38.1	(2.92)	8.9	(1.66)	13.8	(2.47)	21.3	(3.71)	38.7	(3.82)	33.9	(4.15)	6.1 !	(2.20)
Bahrain	100.0	(†)	70.5	(2.78)	29.5	(2.78)	4.6 !	(1.78)	3.6 !	(1.54)	18.8	(2.58)	22.3	(6.12)	28.2	(6.27)	47.3	(6.93)	‡	(†)
Canada[6,7,8]	100.0	(†)	50.2	(3.35)	49.8	(3.35)	9.3	(1.92)	21.6	(2.82)	18.7	(2.87)	18.5	(3.39)	25.1	(3.53)	38.9	(4.78)	17.5	(4.24)
Chile	100.0	(†)	51.2	(4.60)	48.8	(4.60)	13.0	(3.18)	21.4	(3.79)	14.1	(3.36)	10.4 !	(4.26)	6.1 !	(2.91)	70.3	(6.66)	13.2 !	(4.40)
Chinese Taipei	100.0	(†)	71.8	(3.47)	28.2	(3.47)	‡	(†)	20.8	(3.12)	6.3	(1.65)	‡	(†)	‡	(†)	57.8	(7.17)	33.4	(7.11)
Egypt	100.0	(†)	51.9	(3.88)	48.1	(3.88)	3.0 !	(1.44)	6.3 !	(1.88)	38.1	(3.73)	23.8	(5.01)	32.8	(5.13)	40.2	(5.41)	‡	(†)
England (United Kingdom)	100.0	(†)	71.2	(4.06)	28.8	(4.06)	10.4	(2.79)	‡	(†)	17.0	(3.14)	15.5 !	(6.49)	17.2 !	(5.72)	50.4	(7.83)	17.0 !	(5.43)
Georgia[7,10]	100.0	(†)	62.3	(3.65)	37.7	(3.65)	8.2	(1.75)	3.7 !	(1.65)	25.7	(3.36)	13.4	(3.98)	31.5	(5.90)	46.5	(6.54)	‡	(†)
Hong Kong (China)	100.0	(†)	78.7	(3.64)	21.3	(3.64)	6.3 !	(2.29)	5.5 !	(1.86)	7.9 !	(2.45)	16.8 !	(6.86)	18.5 !	(5.82)	39.8	(8.82)	24.9 !	(8.43)
Hungary	100.0	(†)	70.3	(3.77)	29.7	(3.77)	2.0 !	(0.72)	7.1	(2.11)	20.2	(3.18)	11.1 !	(4.49)	37.1	(6.75)	47.0	(7.16)	‡	(†)
Iran, Islamic Republic of	100.0	(†)	71.9	(3.04)	28.1	(3.04)	0.7 !	(0.25)	3.2 !	(0.98)	21.1	(2.84)	7.7 !	(3.68)	31.3	(7.20)	47.9	(7.07)	13.1 !	(4.99)
Ireland	100.0	(†)	74.6	(2.79)	25.4	(2.79)	6.3	(1.68)	2.3 !	(0.73)	15.6	(2.60)	6.4 !	(2.67)	23.3	(5.18)	33.1	(5.94)	37.3	(5.55)
Israel[11]	100.0	(†)	83.4	(2.36)	16.6	(2.36)	6.1	(1.71)	2.2 !	(0.70)	7.7	(1.40)	22.7	(5.69)	22.7	(5.74)	41.6	(6.99)	12.9 !	(4.16)
Italy[10]	100.0	(†)	57.5	(3.68)	42.5	(3.68)	2.9 !	(1.39)	25.2	(3.17)	14.4	(2.42)	16.6	(4.70)	26.7	(4.98)	44.8	(5.84)	12.0 !	(4.02)
Japan	100.0	(†)	56.7	(3.70)	43.3	(3.70)	10.1	(2.36)	7.9	(1.90)	24.2	(3.53)	‡	(†)	‡	(†)	22.3	(4.50)	76.9	(4.67)
Jordan	100.0	(†)	61.0	(3.25)	39.0	(3.25)	7.0	(1.64)	8.9	(2.23)	22.4	(2.53)	14.8 !	(4.90)	29.9	(6.03)	49.5	(6.97)	‡	(†)
Kazakhstan	100.0	(†)	47.2	(3.93)	52.8	(3.93)	22.6	(3.75)	22.0	(2.99)	5.6 !	(1.72)	36.0	(4.66)	49.1	(6.34)	13.9 !	(4.35)	‡	(†)
Korea, Republic of	100.0	(†)	61.4	(3.59)	38.6	(3.59)	2.6 !	(1.03)	22.7	(3.02)	11.4	(2.33)	19.7	(5.00)	20.3	(3.88)	40.3	(4.52)	19.6	(3.83)
Kuwait	100.0	(†)	81.3	(3.44)	18.7	(3.44)	7.2 !	(2.63)	‡	(†)	6.3 !	(1.90)	53.2	(10.37)	26.9 !	(8.25)	14.2 !	(6.87)	‡	(†)
Lebanon	100.0	(†)	92.2	(2.29)	7.8	(2.29)	‡	(†)	‡	(†)	‡	(†)	43.7 !	(15.17)	‡	(†)	‡	(†)	‡	(†)
Lithuania[10]	100.0	(†)	62.0	(4.04)	38.0	(4.04)	‡	(†)	11.0	(2.61)	26.1	(3.66)	5.4 !	(2.21)	8.9 !	(4.11)	68.3	(4.77)	17.5	(4.98)
Malaysia	100.0	(†)	89.9	(1.98)	10.1	(1.98)	‡	(†)	‡	(†)	6.7	(1.59)	‡	(†)	9.2 !	(4.46)	71.0	(8.98)	15.7 !	(7.83)
Malta	100.0	(†)	96.5	(0.05)	3.5	(0.05)	‡	(†)	1.2	(0.03)	2.3	(0.04)	3.8	(0.05)	6.9	(0.10)	48.5	(0.71)	40.8	(0.67)
Morocco	100.0	(†)	89.3	(2.17)	10.7	(2.17)	‡	(†)	1.1 !	(0.39)	6.4	(1.75)	‡	(†)	‡	(†)	45.3	(10.15)	40.4	(9.49)
New Zealand[8]	100.0	(†)	52.7	(3.53)	47.3	(3.53)	15.9	(3.41)	8.5	(2.02)	21.9	(2.78)	17.9	(3.73)	34.5	(4.33)	33.3	(3.61)	14.4	(2.58)
Norway[13]	100.0	(†)	59.6	(3.93)	40.4	(3.93)	18.2	(3.36)	8.2	(2.32)	14.0	(2.68)	‡	(†)	28.3	(5.89)	60.8	(6.85)	9.0 !	(3.94)
Oman	100.0	(†)	90.8	(1.84)	9.2	(1.84)	3.2	(0.92)	1.9 !	(0.94)	3.9 !	(1.28)	14.4 !	(4.87)	35.6	(8.94)	50.0	(10.52)	‡	(†)
Qatar	100.0	(†)	64.4	(2.63)	35.6	(2.63)	20.0	(1.46)	4.8 !	(2.07)	7.6	(1.37)	28.3	(5.21)	46.9	(6.44)	23.7	(5.24)	‡	(†)
Russian Federation	100.0	(†)	52.7	(3.49)	47.3	(3.49)	6.9 !	(2.13)	16.3	(2.57)	22.4	(3.66)	13.8	(3.67)	47.9	(5.37)	36.2	(5.82)	‡	(†)
Saudi Arabia	100.0	(†)	82.9	(2.95)	17.1	(2.95)	‡	(†)	5.4 !	(1.72)	7.7 !	(2.50)	16.6 !	(7.71)	57.3	(9.53)	26.2 !	(8.44)	‡	(†)
Singapore[10]	100.0	(†)	65.5	(2.45)	34.5	(2.45)	16.9	(1.79)	3.8 !	(1.16)	13.6	(1.84)	15.2	(3.29)	18.6	(3.62)	54.0	(4.41)	12.3	(2.90)
Slovenia	100.0	(†)	80.8	(2.54)	19.2	(2.54)	3.9	(1.03)	1.8 !	(0.73)	13.5	(2.24)	‡	(†)	11.4	(2.96)	73.0	(4.88)	12.3 !	(4.07)
Sweden	100.0	(†)	34.8	(3.64)	65.2	(3.64)	48.3	(4.63)	4.6 !	(1.75)	12.3	(2.94)	9.0 !	(3.30)	16.1	(3.61)	43.2	(5.30)	31.8	(5.61)
Thailand	100.0	(†)	61.0	(4.49)	39.0	(4.49)	21.2	(3.39)	9.5	(2.57)	6.1 !	(1.84)	12.6 !	(4.52)	30.2	(5.64)	35.7	(5.54)	21.5	(5.18)
Turkey	100.0	(†)	83.8	(2.31)	16.2	(2.31)	‡	(†)	5.5	(1.43)	7.4	(1.84)	22.6 !	(8.73)	37.9	(7.98)	32.7	(8.80)	‡	(†)
United Arab Emirates	100.0	(†)	56.1	(2.19)	43.9	(2.19)	23.6	(1.59)	8.2	(1.10)	9.5	(1.44)	38.5	(3.19)	34.6	(3.19)	24.2	(3.03)	2.7 !	(0.84)
United States[8]	100.0	(†)	61.3	(2.90)	38.7	(2.90)	16.3	(2.43)	13.4	(2.31)	8.3	(1.67)	25.0	(4.16)	38.3	(4.50)	28.0	(4.35)	8.8 !	(2.64)

See notes at end of table.

Table 8.2. Average mathematics score and percentage of eighth-graders, by mathematics teachers' reports of student access to computers and frequency of computer use during mathematics lessons and country or other education system: 2015—Continued

[Standard errors appear in parentheses]

Country or other education system[1]	Total, all eighth-graders		Student access to computers (including tablets) to use during mathematics lessons: No computers are available to students during lessons		Computers are available to students during lessons: Total, all students who have computers available[3]		Each student has a computer		Class has computers that students can share		School has computers that the class can use sometimes		Among students who have computers (including tablets) available, frequency of computer use during mathematics lessons[2]: Every day or almost every day		Once or twice a week		Once or twice a month		Never or almost never	
1	2		3		4		5		6		7		8		9		10		11	
Benchmarking education systems																				
Abu Dhabi (United Arab Emirates)	100.0	(†)	69.7	(4.99)	30.3	(4.99)	8.7 !	(3.07)	9.0	(2.32)	11.5	(3.28)	33.1	(7.85)	24.2	(6.99)	39.9	(7.97)	‡	(†)
Buenos Aires[8] (Argentina)	100.0	(†)	42.3	(6.89)	57.7	(6.89)	43.9	(6.68)	‡	(†)	7.9 !	(3.40)	11.9 !	(5.66)	13.3 !	(6.30)	62.4	(8.33)	12.3 !	(5.31)
Dubai (United Arab Emirates)	100.0	(†)	37.1	(2.55)	62.9	(2.55)	27.4	(1.52)	15.8	(2.57)	15.7	(2.35)	38.5	(2.77)	36.0	(3.47)	23.4	(3.14)	‡	(†)
Florida[7,14] (United States)	100.0	(†)	71.6	(5.13)	28.4	(5.13)	‡	(†)	17.5	(4.27)	6.6 !	(3.28)	40.5	(10.49)	21.7	(6.32)	37.7 !	(11.34)	‡	(†)
Ontario (Canada)	100.0	(†)	36.7	(5.07)	63.3	(5.07)	7.7 !	(2.70)	36.8	(4.79)	18.5	(3.25)	18.0	(3.89)	30.9	(4.66)	41.8	(5.61)	9.4 !	(3.55)
Quebec[15] (Canada)	100.0	(†)	80.1	(2.46)	19.9	(2.46)	12.1	(2.56)	‡	(†)	6.6 !	(2.74)	30.4	(8.11)	13.3 !	(5.10)	25.5	(7.57)	30.8	(8.81)

†Not applicable.
!Interpret data with caution. The coefficient of variation (CV) for this estimate is between 30 and 50 percent.
‡Reporting standards not met. Either there are too few cases for a reliable estimate or the coefficient of variation (CV) is 50 percent or greater.
[1]Most of the education systems represent complete countries, but some represent subnational entities; examples include two Canadian provinces (Ontario and Quebec), a component of the United Kingdom (England), the U.S. state of Florida, and a few individual cities (such as Abu Dhabi within the United Arab Emirates).
[2]Teachers were asked how often they had students do the following four activities on computers during mathematics lessons: explore mathematics principles and concepts; practice skills and procedures; look up ideas and information; and process and analyze data. The overall frequency of computer use corresponds to the highest frequency reported for any one of these activities.
[3]The total of all students who have computers available during lessons includes students for whom data on the specific type of computer access is missing. Their teachers indicated that computers were available to students during lessons, but either failed to answer the three follow-up questions about specific type of computer access or answered "No" to each of the three types of access. Among sampled students with computers available during mathematics lessons, 4 percent are missing data on the type of computer access; however, the percentage varies widely by country (from 0 to 33 percent). These students are included in the total shown in column 4, but are not included in columns 5 through 7.
[4]Trends in International Mathematics and Science Study (TIMSS) scores are reported on a scale from 0 to 1,000, with the scale centerpoint set at 500 and the standard deviation set at 100.
[5]The international average includes only education systems that are members of the International Association for the Evaluation of Educational Achievement (IEA), which develops and implements TIMSS at the international level. "Benchmarking" education systems are not members of the IEA and are therefore not included in the average.
[6]Data for Canada include only students from the provinces of Manitoba, Newfoundland, Ontario, and Quebec.
[7]National Target Population does not include all of the International Target Population.
[8]Met guidelines for sample participation rates only after replacement schools were included.
[9]The TIMSS & PIRLS International Study Center has reservations about the reliability of the average achievement score because the percentage of students with achievement too low for estimation exceeds 15 percent, though it is less than 25 percent.
[10]National Defined Population covers 90 to 95 percent of National Target Population.
[11]National Defined Population covers less than 90 percent of the National Target Population (but at least 77 percent).
[12]The TIMSS & PIRLS International Study Center has reservations about the reliability of the average achievement score because the percentage of students with achievement too low for estimation exceeds 25 percent.
[13]Norway collected data from students in their ninth year of schooling rather than in grade 8 because year 1 in Norway is considered the equivalent of kindergarten rather than the first year of primary school.
[14]U.S. state-level data are based on public school students only.
[15]Did not satisfy guidelines for sample participation rates.
NOTE: Countries and other education systems were required to draw probability samples of students who were nearing the end of their eighth year of formal schooling (counting the first year of primary school as year 1), provided that the mean age at the time of testing was at least 13.5 years. Detail may not sum to totals because of rounding and missing data.
SOURCE: International Association for the Evaluation of Educational Achievement (IEA), Trends in International Mathematics and Science Study (TIMSS), 2015. (This table was prepared January 2017.)

Table 8.3. Average science score and percentage of eighth-graders, by science teachers' reports of student access to computers and frequency of computer use during science lessons and country or other education system: 2015

[Standard errors appear in parentheses]

Country or other education system[1]	Total, all eighth-graders		Student access to computers (including tablets) to use during science lessons								Among students who have computers (including tablets) available, frequency of computer use during science lessons[2]							
			No computers are available to students during lessons		Computers are available to students during lessons													
					Total, all students who have computers available[3]		Each student has a computer		Class has computers that students can share		School has computers that the class can use sometimes		Every day or almost every day		Once or twice a week		Once or twice a month		Never or almost never	
1	2		3		4		5		6		7		8		9		10		11	
	Average science score[4]																			
International average[5]	**492**	**(0.6)**	**489**	**(0.8)**	**498**	**(1.0)**	**507**	**(2.7)**	**499**	**(2.5)**	**498**	**(1.6)**	**501**	**(2.8)**	**497**	**(1.6)**	**500**	**(1.8)**	**486**	**(5.5)**
Australia	512	(2.7)	509	(5.1)	519	(3.0)	523	(3.6)	519	(6.6)	508	(5.6)	531	(6.7)	515	(4.5)	520	(5.4)	416	(40.4)
Bahrain	466	(2.2)	467	(3.3)	463	(4.9)	505	(10.3)	443	(11.2)	461	(6.3)	496	(10.9)	453	(7.9)	454	(8.0)	‡	(†)
Canada[6,7,8]	526	(2.2)	521	(3.6)	531	(2.6)	532	(6.8)	529	(4.5)	532	(4.1)	536	(7.1)	531	(4.9)	529	(4.3)	544	(6.6)
Chile	454	(3.1)	454	(5.4)	459	(5.3)	452	(9.0)	460	(9.9)	468	(7.2)	443	(16.1)	453	(11.6)	466	(6.7)	465	(17.5)
Chinese Taipei	569	(2.1)	566	(2.8)	574	(4.1)	556	(22.3)	574	(6.0)	578	(6.3)	545	(28.1)	573	(8.3)	578	(5.5)	573	(10.3)
Egypt	371	(4.3)	362	(6.7)	377	(5.7)	395	(51.7)	364	(15.1)	379	(6.5)	372	(15.5)	372	(7.7)	389	(8.3)	388	(39.1)
England (United Kingdom)	537	(3.8)	534	(6.3)	543	(5.8)	528	(10.9)	544	(10.7)	550	(7.3)	522	(14.3)	537	(13.2)	546	(6.3)	547	(19.2)
Georgia[7,9]	443	(3.1)	440	(4.5)	446	(3.2)	454	(6.1)	453	(5.5)	441	(3.8)	448	(5.0)	448	(4.2)	440	(5.3)	455	(25.0)
Hong Kong (China)	546	(3.9)	542	(4.6)	555	(8.9)	583	(22.3)	546	(10.0)	552	(14.8)	567	(20.6)	536	(10.2)	563	(10.5)	520	(8.5)
Hungary	527	(3.4)	529	(4.4)	522	(5.1)	523	(9.9)	538	(9.5)	518	(5.7)	525	(9.0)	533	(6.1)	517	(6.6)	463	(43.2)
Iran, Islamic Republic of	456	(4.0)	443	(6.0)	477	(5.3)	‡	(†)	489	(11.4)	471	(6.2)	500	(12.3)	475	(7.3)	467	(13.3)	460	(7.2)
Ireland	530	(2.8)	538	(3.3)	533	(4.3)	538	(6.5)	545	(10.5)	529	(6.6)	530	(20.2)	522	(7.8)	531	(7.1)	548	(6.0)
Israel[10]	508	(3.9)	499	(5.3)	522	(7.5)	537	(14.8)	545	(8.8)	494	(13.1)	516	(13.9)	519	(14.7)	525	(12.7)	558	(7.0)
Italy[9]	499	(2.4)	498	(3.7)	499	(4.2)	500	(17.7)	494	(6.1)	507	(7.4)	494	(19.7)	493	(8.5)	505	(4.6)	481	(48.1)
Japan	571	(1.8)	570	(3.2)	571	(3.0)	566	(5.2)	585	(6.9)	568	(3.5)	575	(8.1)	578	(9.4)	577	(6.1)	567	(3.4)
Jordan	426	(3.4)	417	(5.0)	438	(4.9)	409	(18.1)	467	(18.4)	438	(6.2)	458	(11.4)	433	(8.3)	438	(11.1)	328	(9.0)
Kazakhstan	533	(4.4)	531	(8.3)	534	(5.2)	526	(7.5)	538	(6.7)	549	(11.0)	527	(6.7)	534	(7.0)	563	(11.1)	‡	(†)
Korea, Republic of	556	(2.2)	557	(2.7)	554	(3.3)	553	(5.4)	551	(4.0)	564	(4.7)	549	(5.0)	554	(5.4)	557	(5.0)	553	(6.7)
Kuwait	411	(5.2)	408	(6.3)	410	(10.9)	370	(48.7)	434	(8.7)	411	(11.9)	397	(19.7)	433	(10.2)	381	(25.7)	‡	(†)
Lebanon	398	(5.3)	393	(5.7)	427	(13.9)	443	(26.1)	419	(18.9)	420	(26.0)	426	(54.4)	417	(20.8)	416	(20.9)	‡	(†)
Lithuania[9]	519	(2.8)	519	(3.6)	519	(3.3)	522	(10.6)	517	(4.6)	518	(4.2)	528	(7.6)	521	(8.0)	516	(3.9)	522	(14.4)
Malaysia	471	(4.1)	467	(4.8)	493	(8.7)	534	(8.7)	487	(69.1)	493	(9.0)	568	(18.8)	509	(16.4)	493	(21.0)	487	(4.3)
Malta	481	(1.6)	481	(1.7)	477	(4.5)	567	(8.1)	445	(6.3)	506	(7.9)	404	(19.5)	493	(5.9)	538	(13.9)	427	(9.2)
Morocco	393	(2.5)	391	(2.5)	401	(5.2)	489	(12.0)	398	(8.9)	401	(5.7)	405	(10.5)	405	(10.5)	400	(6.3)	381	(7.7)
New Zealand[8]	513	(3.1)	514	(7.3)	517	(4.7)	537	(10.6)	515	(11.8)	509	(6.4)	531	(14.8)	522	(7.5)	506	(6.6)	541	(19.1)
Norway[11]	509	(2.8)	508	(4.7)	511	(3.7)	507	(5.6)	514	(7.0)	514	(5.6)	511	(27.2)	510	(6.0)	513	(4.6)	509	(12.2)
Oman	455	(2.7)	455	(3.1)	458	(6.2)	448	(11.8)	452	(9.0)	469	(9.1)	454	(7.7)	458	(13.1)	469	(10.9)	432	(73.8)
Qatar	457	(3.0)	459	(5.1)	452	(5.5)	451	(5.2)	466	(17.6)	452	(19.6)	466	(7.6)	424	(10.7)	485	(13.2)	481	(42.0)
Russian Federation	544	(4.2)	539	(6.3)	547	(4.6)	554	(7.0)	545	(7.8)	546	(4.3)	554	(6.1)	549	(5.9)	544	(5.3)	518	(9.0)
Saudi Arabia	396	(4.5)	386	(5.6)	413	(7.7)	443	(5.9)	428	(13.2)	407	(10.4)	427	(17.0)	399	(11.4)	393	(20.0)	392	(5.7)
Singapore[9]	597	(3.2)	602	(4.4)	592	(4.9)	605	(8.2)	571	(13.5)	584	(9.7)	614	(28.6)	606	(9.2)	582	(8.1)	601	(11.9)
Slovenia	551	(2.4)	551	(2.6)	551	(3.4)	556	(8.7)	547	(4.1)	551	(3.4)	545	(7.6)	561	(8.9)	548	(3.4)	549	(8.5)
Sweden	522	(3.4)	533	(6.2)	520	(3.9)	517	(5.7)	503	(11.0)	530	(5.9)	510	(6.7)	514	(6.6)	528	(5.1)	521	(10.3)
Thailand	456	(4.2)	445	(5.8)	468	(6.4)	470	(8.2)	467	(13.9)	461	(19.5)	482	(20.5)	462	(8.4)	471	(9.2)	418 !	(141.5)
Turkey	493	(4.0)	480	(4.4)	528	(6.9)	534	(15.3)	535	(10.4)	523	(11.4)	550	(14.5)	525	(7.2)	511	(13.2)	507	(3.7)
United Arab Emirates	477	(2.3)	472	(5.5)	486	(4.4)	474	(6.0)	516	(7.6)	484	(10.7)	486	(7.0)	479	(6.6)	508	(9.5)	‡	(†)
United States[8]	530	(2.8)	527	(4.3)	541	(4.4)	544	(7.4)	532	(6.3)	548	(7.8)	536	(7.8)	545	(7.9)	541	(6.0)	551	(21.9)

See notes at end of table.

Table 8.3. Average science score and percentage of eighth-graders, by science teachers' reports of student access to computers and frequency of computer use during science lessons and country or other education system: 2015—Continued

[Standard errors appear in parentheses]

Country or other education system[1]	Total, all eighth-graders		Student access to computers (including tablets) to use during science lessons								Among students who have computers (including tablets) available, frequency of computer use during science lessons[2]							
			No computers are available to students during lessons		Computers are available to students during lessons													
					Total, all students who have computers available[3]		Each student has a computer		Class has computers that students can share		School has computers that the class can use sometimes		Every day or almost every day		Once or twice a week		Once or twice a month		Never or almost never	
1	2		3		4		5		6		7		8		9		10		11	
Benchmarking education systems																				
Abu Dhabi (United Arab Emirates)	454	(5.6)	449	(9.5)	469	(13.2)	531	(19.2)	474	(12.6)	432	(17.7)	491	(26.3)	446	(15.9)	503	(16.1)	‡	(†)
Buenos Aires[8] (Argentina)	386	(4.2)	402	(11.8)	377	(11.7)	359	(15.2)	409	(12.1)	413	(83.6)	406	(13.2)	363	(23.3)	401	(14.9)	321	(30.9)
Dubai (United Arab Emirates)	525	(2.0)	515	(4.7)	528	(3.7)	515	(6.4)	546	(6.0)	531	(6.7)	527	(6.3)	529	(8.3)	531	(6.6)	‡	(†)
Florida[7,12] (United States)	508	(6.0)	527	(10.3)	509	(14.9)	521	(26.3)	516	(26.1)	481	(13.3)	536	(31.5)	501	(17.2)	507	(21.8)	‡	(†)
Ontario (Canada)	524	(2.5)	519	(4.8)	529	(3.0)	527	(10.7)	525	(4.9)	534	(4.8)	532	(9.5)	527	(5.7)	527	(4.5)	547	(4.6)
Quebec[13] (Canada)	530	(4.4)	522	(5.7)	541	(5.9)	539	(6.8)	535	(8.6)	538	(10.7)	540	(9.8)	551	(13.1)	538	(8.5)	‡	(†)
	Percent of students																			
International average[5]	**100.0**	**(†)**	**56.1**	**(0.53)**	**43.9**	**(0.53)**	**11.8**	**(0.36)**	**12.0**	**(0.37)**	**18.9**	**(0.42)**	**18.6**	**(0.73)**	**36.3**	**(0.91)**	**37.6**	**(0.92)**	**7.4**	**(0.48)**
Australia	100.0	(†)	33.6	(3.00)	66.4	(3.00)	38.3	(3.16)	11.9	(2.04)	15.9	(1.99)	19.3	(2.28)	47.7	(3.63)	31.9	(3.62)	‡	(†)
Bahrain	100.0	(†)	64.4	(2.10)	35.6	(2.10)	3.9 !	(1.42)	6.5	(1.70)	24.3	(1.98)	19.7	(4.67)	36.4	(5.98)	43.8	(6.49)	‡	(†)
Canada[6,7,8]	100.0	(†)	42.0	(2.64)	58.0	(2.64)	11.7	(2.23)	24.8	(3.19)	20.9	(3.07)	14.9	(2.69)	43.3	(4.88)	37.8	(4.27)	‡	(†)
Chile	100.0	(†)	44.4	(4.23)	55.6	(4.23)	20.7	(3.13)	18.9	(3.86)	14.9	(2.51)	13.1 !	(4.41)	32.4	(6.02)	48.2	(5.87)	6.3 !	(3.00)
Chinese Taipei	100.0	(†)	55.8	(3.75)	44.2	(3.75)	4.2 !	(1.63)	24.6	(3.07)	14.2	(2.69)	4.9 !	(2.33)	24.7	(4.57)	45.3	(5.91)	25.2	(5.45)
Egypt	100.0	(†)	39.4	(3.51)	60.6	(3.51)	‡	(†)	5.1	(1.40)	52.8	(3.51)	21.5	(4.39)	52.9	(5.11)	24.2	(4.05)	‡	(†)
England (United Kingdom)	100.0	(†)	51.9	(3.30)	48.1	(3.30)	13.1	(2.66)	9.8	(1.78)	24.7	(2.77)	6.0 !	(2.23)	21.7	(3.97)	67.3	(4.52)	5.0	(1.31)
Georgia[7,9]	100.0	(†)	43.1	(2.48)	56.9	(2.48)	13.2	(1.67)	9.5	(1.55)	33.2	(2.51)	23.6	(2.34)	47.1	(3.07)	26.8	(3.00)	2.4 !	(0.94)
Hong Kong (China)	100.0	(†)	78.7	(3.61)	21.3	(3.61)	4.1 !	(1.88)	7.5 !	(2.29)	8.7 !	(2.81)	27.3 !	(9.20)	22.4 !	(8.94)	44.6	(11.65)	‡	(†)
Hungary	100.0	(†)	58.2	(2.54)	41.8	(2.54)	2.5	(0.60)	7.7	(1.10)	30.0	(2.38)	17.6	(2.26)	32.1	(3.90)	47.9	(3.92)	2.5 !	(1.00)
Iran, Islamic Republic of	100.0	(†)	61.5	(3.86)	38.5	(3.86)	‡	(†)	11.9	(2.41)	25.3	(3.23)	18.1	(4.69)	51.0	(5.85)	29.4	(5.20)	‡	(†)
Ireland	100.0	(†)	73.7	(3.09)	26.3	(3.09)	6.1 !	(2.02)	3.9 !	(1.31)	14.9	(2.41)	‡	(†)	29.6	(6.84)	41.0	(6.75)	26.0	(5.04)
Israel[10]	100.0	(†)	59.3	(3.35)	40.7	(3.35)	8.2	(2.02)	16.5	(2.33)	14.9	(2.42)	26.0	(4.40)	32.4	(4.29)	39.0	(4.57)	‡	(†)
Italy[9]	100.0	(†)	51.9	(3.91)	48.1	(3.91)	3.8 !	(1.71)	27.4	(3.26)	16.7	(3.08)	7.3 !	(3.17)	34.0	(4.58)	53.6	(4.92)	‡	(†)
Japan	100.0	(†)	44.5	(4.16)	55.5	(4.16)	12.2	(2.78)	12.7	(2.39)	29.6	(3.31)	6.6 !	(2.61)	5.8 !	(2.67)	34.5	(5.09)	53.1	(5.54)
Jordan	100.0	(†)	55.5	(3.98)	44.5	(3.98)	5.6	(1.59)	5.3	(1.47)	32.7	(3.95)	20.6	(4.35)	51.1	(5.66)	26.5	(5.11)	‡	(†)
Kazakhstan	100.0	(†)	25.6	(3.03)	74.4	(3.03)	34.9	(3.53)	30.5	(3.07)	7.2	(1.13)	40.2	(3.15)	50.2	(3.10)	9.5	(1.67)	‡	(†)
Korea, Republic of	100.0	(†)	49.6	(3.92)	50.4	(3.92)	5.1	(1.37)	22.5	(3.15)	15.2	(2.89)	13.1	(3.52)	26.0	(4.56)	33.4	(5.46)	27.5	(5.22)
Kuwait	100.0	(†)	62.2	(4.29)	37.8	(4.29)	6.7 !	(2.61)	12.8	(2.82)	17.4	(2.90)	46.2	(7.29)	41.9	(7.09)	11.6 !	(4.33)	‡	(†)
Lebanon	100.0	(†)	88.1	(2.56)	11.9	(2.56)	3.7 !	(1.62)	3.2 !	(1.51)	5.0 !	(1.69)	‡	(†)	37.1 !	(11.64)	32.1 !	(11.54)	‡	(†)
Lithuania[9]	100.0	(†)	47.2	(2.51)	52.8	(2.51)	6.8	(1.18)	14.2	(1.73)	30.0	(2.06)	10.4	(1.97)	19.8	(2.96)	64.8	(3.04)	5.0	(1.13)
Malaysia	100.0	(†)	90.4	(1.80)	9.6	(1.80)	1.1 !	(0.57)	‡	(†)	5.4	(1.36)	‡	(†)	26.0 !	(10.95)	61.5	(12.30)	‡	(†)
Malta	100.0	(†)	92.7	(0.27)	7.3	(0.27)	0.8	(0.13)	4.3	(0.19)	2.0	(0.15)	6.7	(1.15)	55.6	(1.95)	13.6	(1.42)	24.2	(1.35)
Morocco	100.0	(†)	76.9	(2.15)	23.1	(2.15)	0.9 !	(0.39)	5.7	(1.09)	13.0	(1.81)	17.3	(3.98)	21.9	(3.80)	56.7	(5.28)	4.0 !	(1.54)
New Zealand[8]	100.0	(†)	39.6	(4.00)	60.4	(4.00)	14.4	(2.93)	14.4	(3.20)	31.4	(3.56)	16.4	(3.68)	28.8	(3.59)	48.5	(4.58)	6.4 !	(2.47)
Norway[11]	100.0	(†)	46.7	(4.11)	53.3	(4.11)	18.9	(3.63)	9.7	(2.66)	24.7	(3.49)	‡	(†)	27.4	(4.84)	57.5	(5.32)	11.8 !	(4.16)
Oman	100.0	(†)	85.1	(2.17)	14.9	(2.17)	2.9	(0.66)	4.8	(1.30)	6.2	(1.57)	44.2	(6.32)	38.0	(8.92)	15.9 !	(6.49)	‡	(†)
Qatar	100.0	(†)	57.6	(2.70)	42.4	(2.70)	23.6	(2.05)	7.3	(1.23)	8.8	(1.89)	37.8	(4.65)	41.3	(5.14)	19.3	(3.36)	1.6	(0.44)
Russian Federation	100.0	(†)	36.3	(2.24)	63.7	(2.24)	9.6	(1.65)	22.3	(2.29)	30.8	(2.44)	16.7	(2.23)	45.2	(3.03)	35.6	(4.32)	2.6 !	(1.05)
Saudi Arabia	100.0	(†)	61.9	(4.08)	38.1	(4.08)	‡	(†)	16.3	(3.30)	18.0	(3.17)	28.1	(7.38)	56.8	(8.52)	12.2 !	(4.69)	‡	(†)
Singapore[9]	100.0	(†)	48.2	(2.32)	51.8	(2.32)	25.6	(2.10)	8.4	(1.43)	17.5	(2.16)	3.8 !	(1.30)	26.0	(2.70)	55.8	(3.34)	14.4	(2.02)
Slovenia	100.0	(†)	68.0	(2.59)	32.0	(2.59)	6.3	(1.27)	6.1	(1.02)	19.5	(1.87)	4.3 !	(1.43)	24.0	(3.72)	67.4	(4.17)	4.2 !	(1.64)
Sweden	100.0	(†)	20.5	(3.11)	79.5	(3.11)	49.0	(4.68)	5.2 !	(1.58)	25.4	(3.60)	9.7	(2.58)	37.0	(3.83)	48.0	(4.12)	5.2 !	(1.65)
Thailand	100.0	(†)	51.0	(4.12)	49.0	(4.12)	28.4	(3.98)	11.2	(2.72)	6.0 !	(1.89)	16.4	(3.92)	49.8	(5.29)	33.1	(5.37)	‡	(†)
Turkey	100.0	(†)	69.5	(3.42)	30.5	(3.42)	1.9 !	(0.88)	13.1	(2.21)	12.8	(2.40)	25.9	(5.33)	52.2	(5.84)	20.0	(5.41)	‡	(†)
United Arab Emirates	100.0	(†)	50.3	(2.70)	49.7	(2.70)	25.7	(1.73)	11.4	(1.47)	12.0	(1.59)	43.8	(2.87)	40.7	(3.23)	15.1	(2.30)	‡	(†)
United States[8]	100.0	(†)	48.6	(3.37)	51.4	(3.37)	19.0	(2.47)	16.3	(2.39)	16.0	(2.16)	26.0	(3.95)	33.1	(3.71)	38.7	(4.08)	‡	(†)

See notes at end of table.

Table 8.3. Average science score and percentage of eighth-graders, by science teachers' reports of student access to computers and frequency of computer use during science lessons and country or other education system: 2015—Continued

[Standard errors appear in parentheses]

Country or other education system[1]	Total, all eighth-graders		Student access to computers (including tablets) to use during science lessons										Among students who have computers (including tablets) available, frequency of computer use during science lessons[2]							
			No computers are available to students during lessons		Computers are available to students during lessons								Every day or almost every day		Once or twice a week		Once or twice a month		Never or almost never	
					Total, all students who have computers available[3]		Each student has a computer		Class has computers that students can share		School has computers that the class can use sometimes									
1	2		3		4		5		6		7		8		9		10		11	
Benchmarking education systems																				
Abu Dhabi (United Arab Emirates)	100.0	(†)	68.7	(5.02)	31.3	(5.02)	7.8 !	(3.04)	10.2	(2.86)	12.3	(3.06)	37.4	(8.36)	48.3	(7.96)	14.4	(3.75)	‡	(†)
Buenos Aires[8] (Argentina)	100.0	(†)	40.7	(7.41)	59.3	(7.41)	38.3	(7.60)	19.4 !	(5.97)	‡	(†)	22.7 !	(7.95)	41.8	(10.12)	27.4	(7.57)	‡	(†)
Dubai (United Arab Emirates)	100.0	(†)	32.1	(2.48)	67.9	(2.48)	31.2	(1.27)	19.3	(1.31)	16.9	(2.11)	50.2	(2.88)	35.5	(2.70)	14.3	(1.58)	‡	(†)
Florida[7,12] (United States)	100.0	(†)	52.9	(8.09)	47.1	(8.09)	17.3 !	(6.44)	18.1	(5.33)	11.8 !	(4.91)	18.6 !	(7.80)	55.6	(10.54)	25.9	(7.07)	‡	(†)
Ontario (Canada)	100.0	(†)	24.6	(3.94)	75.4	(3.94)	12.9	(3.10)	35.6	(4.65)	26.9	(4.91)	12.9	(2.93)	42.9	(5.79)	39.6	(5.30)	‡	(†)
Quebec[13] (Canada)	100.0	(†)	74.5	(4.12)	25.5	(4.12)	9.9	(2.56)	5.4 !	(2.31)	8.8	(2.37)	23.2	(6.74)	27.4 !	(8.24)	46.0	(9.11)	‡	(†)

†Not applicable.
!Interpret data with caution. The coefficient of variation (CV) for this estimate is between 30 and 50 percent.
‡Reporting standards not met. Either there are too few cases for a reliable estimate or the coefficient of variation (CV) is 50 percent or greater.
[1]Most of the education systems represent complete countries, but some represent subnational entities; examples include two Canadian provinces (Ontario and Quebec), a component of the United Kingdom (England), the U.S. state of Florida, and a few individual cities (such as Abu Dhabi within the United Arab Emirates).
[2]Teachers were asked how often they had students do the following five activities on computers during science lessons: practice skills and procedures; look up ideas and information; do science procedures or experiments; study natural phenomena through simulations; and process and analyze data. The overall frequency of computer use corresponds to the highest frequency reported for any one of these activities.
[3]The total of all students who have computers available during lessons includes students for whom data on the specific type of computer access is missing. Their teachers indicated that computers were available to students during lessons, but either failed to answer the three follow-up questions about specific type of computer access or answered "No" to each of the three types of access. Among sampled students with computers available during science lessons, about 3 percent are missing data on the type of computer access; however, the percentage varies widely by country (from 0 to 28 percent). These students are included in the total shown in column 4, but are not included in columns 5 through 7.
[4]Trends in International Mathematics and Science Study (TIMSS) scores are reported on a scale from 0 to 1,000, with the scale centerpoint set at 500 and the standard deviation set at 100.
[5]The international average includes only education systems that are members of the International Association for the Evaluation of Educational Achievement (IEA), which develops and implements TIMSS at the international level. "Benchmarking" education systems are not members of the IEA and are therefore not included in the average.
[6]Data for Canada include only students from the provinces of Manitoba, Newfoundland, Ontario, and Quebec.
[7]National Target Population does not include all of the International Target Population.
[8]Met guidelines for sample participation rates only after replacement schools were included.
[9]National Defined Population covers 90 to 95 percent of National Target Population.
[10]National Defined Population covers less than 90 percent of the National Target Population (but at least 77 percent).
[11]Norway collected data from students in their ninth year of schooling rather than in grade 8 because year 1 in Norway is considered the equivalent of kindergarten rather than the first year of primary school.
[12]U.S. state-level data are based on public school students only.
[13]Did not satisfy guidelines for sample participation rates.
NOTE: Countries and other education systems were required to draw probability samples of students who were nearing the end of their eighth year of formal schooling (counting the first year of primary school as year 1), provided that the mean age at the time of testing was at least 13.5 years. Detail may not sum to totals because of rounding and missing data.
SOURCE: International Association for the Evaluation of Educational Achievement (IEA), Trends in International Mathematics and Science Study (TIMSS), 2015. (This table was prepared January 2017.)

Table 9.1. Percentage distribution of 16- to 19-year-olds, by frequency of using computers or the Internet to perform selected activities in everyday life and country or subnational region: 2012, 2014, and 2015

[Standard errors appear in parentheses]

Country or subnational region[1]	Use e-mail								Use the Internet to understand issues such as health/illness, financial matters, or environmental issues								Use spreadsheet or word processing software			
	Every day		At least once a week but not every day		Less than once a week but at least once a month		Less than once a month or never		Every day		At least once a week but not every day		Less than once a week but at least once a month		Less than once a month or never		Every day		At least once a week but not every day	
1	2		3		4		5		6		7		8		9		10		11	
OECD average[2]	**52.4**	**(0.52)**	**26.1**	**(0.46)**	**8.4**	**(0.29)**	**13.0**	**(0.37)**	**37.4**	**(0.49)**	**28.3**	**(0.47)**	**14.5**	**(0.37)**	**19.8**	**(0.41)**	**17.5**	**(0.38)**	**36.4**	**(0.50)**
Austria	45.2	(2.30)	26.4	(2.23)	11.9	(1.55)	16.5	(1.69)	39.2	(2.32)	30.3	(2.11)	17.4	(1.71)	13.2	(1.54)	14.6	(1.73)	38.8	(2.48)
Canada	63.6	(1.70)	21.8	(1.44)	6.8	(0.96)	7.7	(0.99)	38.0	(1.87)	30.7	(1.77)	14.7	(1.19)	16.6	(1.40)	24.4	(1.54)	39.9	(1.90)
Chile[3]	39.7	(3.56)	32.7	(2.49)	9.3	(2.39)	18.3	(2.92)	40.0	(3.13)	28.7	(2.98)	16.9	(3.10)	14.4	(2.42)	14.9	(3.21)	38.6	(3.68)
Czech Republic	61.6	(2.94)	26.6	(2.60)	5.3	(1.48)	6.5	(1.35)	73.1	(2.09)	19.1	(1.86)	4.7	(1.16)	3.2 !	(1.25)	17.8	(2.74)	51.4	(3.95)
Denmark	54.8	(2.38)	27.1	(2.17)	9.4	(1.42)	8.7	(1.32)	44.9	(2.15)	26.9	(2.01)	16.2	(1.99)	11.9	(1.51)	47.3	(2.18)	31.0	(2.06)
England (UK)	53.4	(3.64)	28.3	(2.94)	7.4	(1.43)	10.9	(2.30)	27.8	(2.55)	35.0	(3.49)	17.2	(2.64)	20.0	(2.98)	18.8	(2.74)	39.9	(3.50)
Estonia	68.3	(2.01)	21.1	(1.71)	5.2	(0.85)	5.3	(1.10)	36.5	(1.88)	30.8	(1.73)	15.3	(1.60)	17.3	(1.29)	9.7	(1.23)	40.6	(2.12)
Finland	38.4	(2.44)	44.6	(2.50)	12.3	(1.73)	4.7	(1.04)	27.0	(2.06)	35.6	(2.21)	22.6	(1.99)	14.9	(1.95)	1.9 !	(0.77)	29.8	(2.32)
Flanders (Belgium)	62.4	(2.24)	24.3	(2.00)	7.8	(1.19)	5.5	(1.03)	37.6	(2.39)	30.5	(2.34)	15.0	(1.85)	16.9	(1.68)	16.3	(1.59)	52.7	(2.36)
France	56.3	(1.91)	25.4	(1.84)	6.4	(0.96)	11.9	(1.28)	51.0	(2.17)	30.5	(1.90)	7.8	(1.19)	10.6	(1.24)	13.6	(1.31)	32.1	(1.80)
Germany	58.0	(2.53)	27.7	(2.11)	6.5	(1.18)	7.8	(1.31)	37.7	(2.71)	34.9	(2.47)	15.6	(1.62)	11.9	(1.61)	14.7	(1.85)	38.7	(2.40)
Greece[3]	36.5	(4.47)	20.1	(3.14)	11.5	(2.19)	31.9	(3.82)	42.1	(4.19)	32.4	(3.69)	11.1	(2.63)	14.5	(2.91)	7.2	(1.51)	18.7	(3.23)
Ireland	46.1	(3.32)	32.3	(3.13)	6.9	(1.52)	14.7	(2.14)	29.6	(2.87)	28.4	(2.58)	16.6	(2.09)	25.4	(2.38)	17.0	(1.76)	35.8	(2.93)
Israel[3]	36.5	(2.30)	20.6	(2.12)	13.0	(1.67)	29.9	(1.81)	38.8	(2.28)	24.5	(2.16)	13.8	(1.62)	23.0	(1.72)	9.0	(1.29)	22.8	(1.92)
Italy	53.2	(3.60)	24.3	(3.46)	5.1	(1.50)	17.4	(2.57)	28.4	(3.64)	23.2	(3.28)	13.5	(2.53)	34.9	(3.58)	19.6	(3.27)	35.0	(3.34)
Japan	61.9	(2.92)	12.9	(1.90)	4.0 !	(1.33)	21.2	(2.44)	6.6	(1.51)	20.4	(2.29)	18.4	(2.42)	54.6	(3.61)	1.9 !	(0.78)	24.3	(2.50)
Korea, Republic of	19.9	(1.89)	34.4	(2.19)	19.5	(1.98)	26.2	(2.03)	8.2	(1.15)	29.3	(1.91)	24.8	(1.94)	37.7	(2.09)	5.0	(1.18)	32.7	(2.29)
Netherlands	73.8	(1.93)	19.5	(1.95)	2.2	(0.64)	4.6	(1.16)	35.3	(2.18)	27.5	(2.36)	16.4	(1.93)	20.8	(1.98)	30.6	(2.34)	42.7	(2.36)
New Zealand[3]	52.5	(2.26)	28.9	(1.93)	7.0	(1.16)	11.7	(1.41)	48.1	(2.15)	30.2	(2.04)	10.2	(1.33)	11.5	(1.46)	17.0	(1.69)	39.7	(2.28)
Northern Ireland (UK)	46.9	(4.46)	29.1	(3.78)	10.7	(2.47)	13.3	(2.94)	34.5	(4.43)	26.3	(3.69)	15.8	(3.09)	23.4	(3.72)	33.0	(3.61)	38.3	(3.15)
Norway	46.6	(2.14)	35.1	(2.18)	10.9	(1.37)	7.4	(1.39)	38.7	(2.47)	35.2	(2.18)	16.3	(1.65)	9.8	(1.17)	31.8	(1.96)	39.1	(2.26)
Poland	56.2	(1.77)	28.3	(1.81)	7.5	(1.08)	8.0	(1.11)	42.7	(2.28)	24.2	(2.07)	15.8	(1.65)	17.4	(1.78)	11.8	(1.52)	41.8	(2.23)
Slovak Republic	65.8	(2.70)	28.0	(2.42)	3.3	(0.82)	2.9	(0.74)	48.6	(2.83)	26.1	(2.43)	8.6	(1.30)	16.7	(1.79)	22.8	(2.22)	45.3	(2.71)
Slovenia[3]	58.2	(2.67)	27.5	(2.63)	7.8	(1.36)	6.5	(1.37)	63.5	(2.44)	18.0	(2.07)	7.3	(1.59)	11.1	(1.58)	11.3	(1.74)	45.3	(2.89)
Spain	70.2	(2.40)	20.2	(2.21)	4.0	(0.95)	5.6	(1.05)	37.5	(2.31)	29.7	(2.18)	10.6	(1.62)	22.1	(2.28)	27.8	(2.33)	36.7	(2.65)
Sweden	52.3	(2.47)	29.2	(2.42)	10.3	(1.66)	8.2	(1.49)	43.6	(2.86)	33.6	(2.69)	11.4	(1.74)	11.4	(1.78)	19.2	(2.03)	40.9	(2.44)
Turkey[3]	31.9	(3.26)	13.7	(2.88)	15.8	(2.91)	38.6	(3.90)	13.7	(2.05)	23.6	(3.35)	14.8	(2.20)	47.9	(2.91)	7.4	(1.54)	10.4	(2.16)
United States[4]	56.5	(2.43)	21.9	(1.89)	8.6	(1.23)	13.1	(1.43)	35.3	(2.43)	26.9	(1.94)	17.1	(1.92)	20.7	(2.02)	23.9	(1.89)	35.6	(2.07)
Non-OECD participants																				
Cyprus[5]	50.9	(3.27)	21.7	(2.74)	8.7	(1.77)	18.7	(2.60)	32.0	(2.78)	27.0	(2.84)	16.7	(2.36)	24.3	(2.61)	17.8	(2.37)	27.7	(2.76)
Jakarta (Indonesia)[3]	22.9	(2.66)	28.0	(2.57)	16.5	(2.59)	32.6	(2.78)	32.3	(3.26)	26.7	(2.44)	19.3	(2.94)	21.7	(2.42)	18.2	(2.72)	44.5	(2.95)
Lithuania[3]	50.9	(3.43)	27.5	(2.88)	9.3	(2.01)	12.3	(1.77)	60.3	(3.64)	21.8	(3.13)	8.9	(2.24)	9.0	(1.75)	6.5	(1.57)	35.0	(3.49)
Russian Federation[6]	57.5	(7.21)	19.5	(3.48)	4.3 !	(1.37)	18.6 !	(5.71)	40.6	(5.36)	21.0	(1.94)	8.7	(2.35)	29.7	(5.30)	21.1	(3.47)	38.6	(2.36)
Singapore[3]	45.9	(2.11)	32.8	(2.03)	6.5	(1.18)	14.9	(1.77)	45.1	(2.21)	31.3	(2.39)	10.6	(1.52)	13.0	(1.73)	16.9	(1.93)	35.3	(2.07)

See notes at end of table.

Table 9.1. Percentage distribution of 16- to 19-year-olds, by frequency of using computers or the Internet to perform selected activities in everyday life and country or subnational region: 2012, 2014, and 2015—Continued

[Standard errors appear in parentheses]

Country or subnational region[1]	Use spreadsheet or word processing software				Use programming languages to write computer code								Participate in real-time discussions on the Internet							
	Less than once a week but at least once a month		Less than once a month or never		Every day		At least once a week but not every day		Less than once a week but at least once a month		Less than once a month or never		Every day		At least once a week but not every day		Less than once a week but at least once a month		Less than once a month or never	
1	12		13		14		15		16		17		18		19		20		21	
OECD average[2]	**20.3**	**(0.43)**	**25.8**	**(0.44)**	**2.3**	**(0.17)**	**5.8**	**(0.26)**	**4.8**	**(0.21)**	**87.1**	**(0.35)**	**33.3**	**(0.49)**	**17.5**	**(0.40)**	**7.4**	**(0.27)**	**41.8**	**(0.52)**
Austria	24.0	(2.01)	22.6	(1.54)	1.7 !	(0.61)	7.3	(1.27)	4.6	(0.97)	86.4	(1.54)	33.0	(2.57)	20.2	(2.05)	11.6	(1.68)	35.2	(2.46)
Canada	18.0	(1.37)	17.7	(1.26)	2.8	(0.64)	3.0	(0.49)	2.7	(0.62)	91.5	(0.97)	31.7	(1.48)	21.8	(1.50)	8.3	(1.02)	38.2	(1.78)
Chile[3]	21.4	(4.59)	25.2	(4.70)	‡	(†)	6.7 !	(2.11)	7.6	(2.04)	82.1	(2.70)	17.9	(3.80)	11.7	(2.36)	11.2	(1.72)	59.2	(4.45)
Czech Republic	18.5	(2.16)	12.3	(1.65)	2.4 !	(0.88)	10.1	(2.06)	6.7	(1.30)	80.8	(2.24)	47.2	(3.00)	15.8	(2.72)	5.5	(1.03)	31.5	(3.73)
Denmark	11.5	(1.56)	10.3	(1.41)	2.4	(0.71)	4.5	(1.25)	5.1	(1.00)	88.0	(1.45)	74.5	(2.23)	13.6	(1.81)	3.9	(0.93)	7.9	(1.20)
England (UK)	15.0	(2.95)	26.3	(2.89)	‡	(†)	‡	(†)	6.7	(1.73)	90.9	(2.15)	27.9	(3.06)	19.9	(3.40)	7.6	(2.14)	44.6	(3.58)
Estonia	28.7	(1.86)	21.0	(1.84)	1.2 !	(0.52)	6.1	(1.17)	6.1	(1.02)	86.6	(1.41)	33.1	(2.16)	19.8	(1.61)	9.2	(1.25)	37.9	(2.26)
Finland	35.2	(2.48)	33.1	(2.08)	1.0 !	(0.47)	2.7 !	(0.87)	5.8	(1.12)	90.5	(1.34)	33.3	(2.28)	22.1	(2.09)	9.2	(1.63)	35.4	(2.40)
Flanders (Belgium)	19.1	(2.01)	11.9	(1.73)	2.6 !	(0.79)	6.0	(1.17)	5.9	(1.09)	85.5	(1.71)	23.2	(2.05)	17.6	(1.58)	7.2	(1.24)	52.0	(2.37)
France	29.1	(1.86)	25.2	(1.83)	5.0	(0.80)	6.4	(1.00)	7.7	(1.16)	80.9	(1.37)	46.9	(1.77)	23.2	(1.59)	9.8	(1.11)	20.1	(1.50)
Germany	29.4	(2.28)	17.1	(1.61)	2.1 !	(0.72)	5.6	(1.11)	5.1	(0.98)	87.2	(1.31)	41.7	(2.70)	22.5	(1.97)	6.9	(1.05)	28.9	(2.56)
Greece[3]	16.3	(2.75)	57.8	(3.67)	3.2 !	(1.41)	9.5 !	(2.89)	3.6 !	(1.46)	83.6	(3.46)	27.9	(4.16)	10.3	(2.49)	3.7 !	(1.49)	58.1	(4.17)
Ireland	17.7	(2.43)	29.5	(2.99)	2.2 !	(0.72)	1.8 !	(0.84)	‡	(†)	95.0	(1.18)	49.6	(3.00)	16.9	(2.18)	2.9 !	(1.02)	30.6	(2.70)
Israel[3]	22.0	(2.11)	46.3	(2.34)	5.0	(1.06)	6.4	(1.21)	2.1	(0.58)	86.5	(1.60)	30.0	(2.15)	9.4	(1.21)	7.1	(1.28)	53.5	(2.30)
Italy	18.9	(2.48)	26.4	(2.81)	4.4 !	(1.65)	7.1	(1.77)	3.2 !	(1.16)	85.3	(2.59)	40.7	(3.40)	23.4	(3.02)	4.9 !	(1.51)	31.1	(3.17)
Japan	16.0	(2.16)	57.9	(3.14)	‡	(†)	6.3	(1.47)	4.9	(1.29)	88.6	(1.89)	6.1	(1.44)	12.9	(2.00)	4.7	(1.22)	76.4	(2.32)
Korea, Republic of	26.5	(1.76)	35.8	(2.26)	1.7 !	(0.60)	12.0	(1.50)	10.8	(1.32)	75.4	(1.76)	26.4	(2.34)	28.1	(2.32)	11.6	(1.41)	33.8	(2.42)
Netherlands	15.7	(1.80)	11.1	(1.50)	1.4 !	(0.55)	5.1	(1.20)	3.0 !	(0.99)	90.5	(1.61)	24.2	(1.86)	13.1	(1.60)	5.6	(1.16)	57.0	(2.57)
New Zealand[3]	20.9	(1.62)	22.4	(2.04)	1.5 !	(0.50)	4.7	(0.98)	3.5	(0.91)	90.3	(1.35)	24.9	(2.09)	17.4	(1.65)	7.8	(1.21)	50.0	(2.29)
Northern Ireland (UK)	11.9	(2.32)	16.9	(3.37)	3.0 !	(1.28)	3.4 !	(1.45)	3.5 !	(1.41)	90.1	(2.29)	30.0	(3.93)	14.9	(2.64)	3.7 !	(1.20)	51.4	(4.06)
Norway	13.3	(1.80)	15.8	(1.72)	1.0 !	(0.42)	4.8	(0.89)	7.8	(1.33)	86.4	(1.66)	44.5	(2.18)	20.6	(1.95)	11.4	(1.57)	23.5	(1.86)
Poland	24.8	(1.81)	21.5	(1.75)	2.7 !	(0.82)	7.6	(1.13)	5.9	(1.01)	83.8	(1.67)	19.3	(1.81)	16.5	(1.78)	9.5	(1.29)	54.6	(2.19)
Slovak Republic	14.9	(1.91)	17.0	(1.69)	1.4 !	(0.60)	6.7	(1.29)	3.6	(1.06)	88.2	(1.68)	44.4	(2.55)	23.9	(2.50)	6.9	(1.42)	24.8	(2.50)
Slovenia[3]	28.8	(2.29)	14.7	(1.55)	2.1 !	(0.74)	5.5	(1.32)	3.3	(0.70)	89.2	(1.74)	38.6	(2.58)	16.0	(2.04)	6.4	(1.44)	39.0	(2.68)
Spain	16.1	(1.92)	19.4	(2.03)	3.2 !	(1.00)	6.8	(1.27)	5.9	(1.16)	84.1	(2.06)	40.3	(2.28)	12.7	(1.92)	4.6	(1.10)	42.4	(2.27)
Sweden	24.6	(2.41)	15.3	(1.76)	1.4 !	(0.47)	7.1	(1.51)	3.5 !	(1.07)	88.0	(1.75)	39.7	(2.81)	23.2	(2.39)	10.7	(1.78)	26.5	(2.36)
Turkey[3]	11.2	(2.33)	71.0	(2.97)	1.6 !	(0.79)	2.6 !	(0.87)	0.9 !	(0.35)	94.9	(1.42)	11.9	(2.53)	8.6	(1.92)	5.7 !	(1.89)	73.8	(2.96)
United States[4]	18.8	(2.11)	21.7	(1.79)	3.4 !	(1.14)	4.4	(1.00)	2.9	(0.60)	89.3	(1.60)	22.0	(1.63)	15.2	(1.62)	10.5	(1.59)	52.3	(2.50)
Non-OECD participants																				
Cyprus[5]	18.5	(2.74)	36.0	(2.90)	5.5	(1.45)	3.9	(1.01)	6.2	(1.34)	84.3	(2.04)	42.4	(2.81)	16.6	(2.39)	5.7	(1.37)	35.4	(2.88)
Jakarta (Indonesia)[3]	14.8	(2.08)	22.4	(2.39)	‡	(†)	8.2	(1.83)	5.1	(1.41)	83.8	(2.93)	33.3	(2.82)	21.5	(2.52)	8.8	(1.67)	36.4	(2.79)
Lithuania[3]	21.8	(2.93)	36.6	(3.29)	1.4 !	(0.63)	9.6	(1.84)	10.0	(2.33)	79.0	(2.86)	20.7	(3.10)	18.4	(2.97)	4.8 !	(1.46)	56.0	(3.30)
Russian Federation[6]	12.7	(2.07)	27.6	(3.77)	1.8 !	(0.73)	4.7	(0.83)	2.6	(0.40)	90.8	(1.07)	36.7	(4.03)	22.5	(2.89)	6.1 !	(1.95)	34.7	(4.01)
Singapore[3]	21.9	(2.13)	25.9	(2.05)	3.2	(0.82)	10.6	(1.56)	4.3	(0.95)	81.9	(1.74)	25.6	(2.22)	17.6	(2.04)	8.8	(1.42)	48.1	(2.37)

†Not applicable.
!Interpret data with caution. The coefficient of variation (CV) for this estimate is between 30 and 50 percent.
‡Reporting standards not met. Either there are too few cases for a reliable estimate or the coefficient of variation (CV) is 50 percent or greater.
[1]Most entities participating in the Program for the International Assessment of Adult Competencies (PIAAC) survey are countries, but a few of them are subnational regions. Following the name of each subnational region, its country is indicated in parentheses. For example, England and Northern Ireland are both part of the United Kingdom (UK).
[2]Refers to the mean of the data values for all reporting Organization for Economic Cooperation and Development (OECD) countries and subnational regions, to which each country or subnational region reporting data contributes equally.
[3]Data are from 2015. Except where otherwise noted, data for other countries/regions are from 2012.
[4]Results from the United States are based on combined data from 2012 and 2014.
[5]Cyprus includes only the population under the effective control of the Government of the Republic of Cyprus.
[6]The Russian Federation does not include the population of the Moscow municipal region.
NOTE: The main data collection for the PIAAC survey was completed in 2012. Unless otherwise noted, all countries' and subnational regions' results are based on the 2012 round of data collection. A second round of international data collection was completed in 2015; this round was conducted only in nine countries/regions that did not participate in the first round. In the United States only, a supplemental round of data collection was completed in 2014 in order to expand the sample of U.S. adults, allowing for more in-depth data analysis. Detail may not sum to totals because of rounding.
SOURCE: U.S. Department of Education, National Center for Education Statistics, Program for the International Assessment of Adult Competencies (PIAAC), U.S. PIAAC 2012/2014; Organization for Economic Cooperation and Development (OECD), PIAAC 2012 and 2015. (This table was prepared October 2016.)

Table 10.1. Percentage of persons age 3 and over and ages 3 to 18 with no internet access at home and percentage distribution of those with no home access, by main reason for not having access and selected characteristics: 2010 and 2015

[Standard errors appear in parentheses]

Selected characteristic	2010[1]														2015													
	Percent with no access at home		Percentage distribution of those with no home access, by main reason for not having access[2]												Percent with no access at home		Percentage distribution of those with no home access, by main reason for not having access[2]											
			Don't need it, not interested		Too expensive		Can use it somewhere else		Not available in area		No computer or computer inadequate		Other reasons[3]				Don't need it, not interested		Too expensive		Can use it somewhere else		Not available in area		No computer or computer inadequate		Privacy or security concerns		Other reasons[3]	
1	2		3		4		5		6		7		8		9		10		11		12		13		14		15		16	
Total, all persons age 3 and over	**24.1**	**(0.25)**	**39.9**	**(0.54)**	**30.5**	**(0.58)**	**5.4**	**(0.29)**	**1.1**	**(0.11)**	**15.8**	**(0.50)**	**7.4**	**(0.30)**	**22.6**	**(0.24)**	**51.4**	**(0.52)**	**26.7**	**(0.50)**	**2.2**	**(0.17)**	**3.0**	**(0.25)**	**7.6**	**(0.31)**	**1.4**	**(0.13)**	**7.6**	**(0.32)**
Sex																												
Male	23.4	(0.28)	39.7	(0.59)	30.4	(0.67)	5.8	(0.34)	1.0	(0.12)	15.6	(0.55)	7.5	(0.34)	22.1	(0.27)	51.4	(0.61)	26.8	(0.57)	2.2	(0.19)	3.2	(0.28)	7.4	(0.36)	1.5	(0.15)	7.6	(0.38)
Female	24.8	(0.27)	40.2	(0.59)	30.6	(0.60)	5.0	(0.28)	1.1	(0.13)	15.9	(0.52)	7.3	(0.32)	23.0	(0.27)	51.4	(0.57)	26.7	(0.56)	2.2	(0.18)	2.9	(0.25)	7.8	(0.33)	1.4	(0.13)	7.7	(0.34)
Race/ethnicity																												
White	19.4	(0.26)	48.2	(0.78)	23.9	(0.68)	5.2	(0.31)	1.5	(0.16)	13.5	(0.48)	7.7	(0.39)	19.3	(0.30)	57.3	(0.66)	19.5	(0.56)	2.3	(0.24)	3.7	(0.37)	6.5	(0.34)	1.9	(0.18)	8.7	(0.45)
Black	37.1	(0.83)	32.3	(1.38)	35.9	(1.54)	6.1	(0.63)	0.6 !	(0.19)	19.0	(1.34)	6.0	(0.59)	32.6	(0.66)	44.8	(1.37)	34.8	(1.34)	2.4	(0.41)	2.0	(0.36)	8.7	(0.77)	1.4	(0.31)	5.9	(0.60)
Hispanic	36.5	(0.84)	28.8	(1.15)	40.8	(1.43)	4.9	(0.60)	0.5 !	(0.19)	17.6	(1.12)	7.4	(0.64)	29.9	(0.76)	43.7	(1.19)	37.1	(1.29)	1.7	(0.37)	2.0	(0.36)	8.9	(0.84)	0.4 !	(0.13)	6.2	(0.64)
Asian	13.0	(0.79)	41.6	(3.41)	24.1	(3.45)	5.9	(1.41)	‡	(†)	16.4	(2.28)	11.8	(2.00)	15.8	(0.99)	53.3	(2.91)	20.8	(2.57)	2.8 !	(0.95)	3.0 !	(1.34)	8.5	(1.74)	‡	(†)	11.0	(1.84)
Pacific Islander	29.7	(5.42)	23.0 !	(9.50)	44.9 !	(13.73)	‡	(†)	‡	(†)	31.5 !	(11.91)	‡	(†)	23.6	(3.89)	35.7	(9.25)	37.7	(10.68)	‡	(†)	‡	(†)	11.4 !	(4.37)	‡	(†)	‡	(†)
American Indian/Alaska Native	38.7	(2.96)	34.0	(4.57)	28.4	(4.76)	8.5 !	(2.66)	3.5 !	(1.65)	22.0	(4.71)	3.6 !	(1.34)	32.1	(2.41)	36.6	(4.26)	37.1	(4.57)	6.1 !	(2.15)	6.7 !	(2.03)	6.8	(1.57)	‡	(†)	5.6	(1.62)
Two or more races	21.5	(1.39)	28.0	(3.30)	35.7	(3.28)	10.1	(2.39)	‡	(†)	17.5	(2.72)	8.5	(2.18)	18.1	(1.29)	42.5	(3.39)	35.6	(3.45)	1.8 !	(0.82)	‡	(†)	10.5	(2.31)	3.1 !	(1.22)	3.4 !	(1.11)
Age																												
3 and 4	26.3	(0.83)	21.0	(1.59)	48.3	(2.12)	3.9	(0.70)	0.9 !	(0.38)	17.6	(1.75)	8.3	(0.95)	19.8	(0.90)	34.5	(2.27)	41.4	(2.23)	1.9 !	(0.68)	4.3	(0.90)	8.1	(1.29)	‡	(†)	8.8	(1.38)
5 to 10	22.3	(0.58)	21.5	(1.36)	46.0	(1.66)	5.7	(0.72)	1.4	(0.32)	18.3	(1.26)	7.1	(0.78)	20.0	(0.63)	36.1	(1.52)	38.7	(1.59)	2.5	(0.53)	4.5	(0.68)	9.5	(0.89)	2.0	(0.55)	6.8	(0.87)
11 to 14	18.1	(0.63)	21.8	(1.57)	47.5	(1.96)	7.1	(1.07)	1.8	(0.45)	15.2	(1.52)	6.6	(0.89)	18.4	(0.60)	38.2	(1.73)	37.4	(1.76)	2.2	(0.55)	5.8	(0.89)	8.2	(0.97)	1.1 !	(0.35)	7.0	(0.92)
15 to 18	18.2	(0.58)	22.1	(1.38)	45.2	(1.66)	7.6	(0.90)	1.9	(0.41)	14.0	(1.32)	9.1	(1.06)	18.2	(0.58)	41.2	(1.81)	35.6	(1.66)	3.5	(0.67)	4.9	(0.75)	6.6	(0.89)	1.6 !	(0.49)	6.7	(1.00)
19 to 24	21.4	(0.59)	24.2	(1.23)	44.2	(1.43)	7.6	(0.84)	1.1	(0.31)	15.7	(1.05)	7.3	(0.73)	17.8	(0.52)	43.1	(1.47)	34.0	(1.59)	3.3	(0.64)	3.8	(0.68)	7.2	(0.94)	1.1	(0.31)	7.6	(0.88)
25 to 29	22.9	(0.59)	26.6	(1.28)	40.7	(1.47)	8.0	(0.90)	1.0	(0.29)	17.0	(1.29)	6.6	(0.80)	19.1	(0.55)	40.5	(1.64)	39.2	(1.75)	2.5	(0.46)	3.4	(0.62)	6.9	(0.81)	0.5 !	(0.18)	7.1	(0.78)
30 to 39	18.9	(0.43)	27.1	(1.20)	39.8	(1.44)	6.8	(0.67)	1.4	(0.28)	16.7	(1.04)	8.2	(0.70)	19.2	(0.41)	40.2	(1.21)	36.2	(1.04)	2.6	(0.44)	4.3	(0.55)	7.7	(0.71)	1.7	(0.30)	7.4	(0.67)
40 to 49	18.3	(0.34)	31.9	(1.05)	35.3	(1.03)	7.1	(0.62)	1.9	(0.26)	15.3	(0.81)	8.4	(0.56)	18.7	(0.45)	41.6	(1.21)	33.6	(1.15)	2.6	(0.37)	5.3	(0.61)	7.8	(0.67)	1.5	(0.29)	7.7	(0.64)
50 to 59	22.8	(0.44)	44.5	(0.95)	26.7	(0.91)	4.6	(0.43)	1.0	(0.26)	16.0	(0.70)	7.1	(0.53)	23.3	(0.44)	58.0	(0.99)	21.7	(0.83)	2.3	(0.30)	1.9	(0.28)	7.8	(0.57)	1.5	(0.22)	6.8	(0.57)
60 to 69	28.3	(0.51)	54.3	(1.19)	17.9	(0.93)	4.6	(0.46)	0.6	(0.15)	15.6	(0.79)	7.0	(0.55)	26.0	(0.47)	60.8	(1.01)	18.3	(0.79)	1.7	(0.26)	1.3	(0.25)	8.3	(0.57)	1.6	(0.26)	8.0	(0.58)
70 or older	50.0	(0.60)	69.8	(0.83)	7.0	(0.45)	2.0	(0.23)	0.2 !	(0.07)	14.3	(0.62)	6.7	(0.40)	41.7	(0.64)	72.2	(0.82)	9.1	(0.50)	1.1	(0.19)	0.8	(0.18)	6.5	(0.46)	1.3	(0.21)	8.9	(0.50)
Metropolitan status[4]																												
Metropolitan[5]	22.7	(0.29)	39.1	(0.58)	31.6	(0.62)	5.6	(0.31)	0.8	(0.12)	15.7	(0.51)	7.2	(0.33)	21.4	(0.26)	51.2	(0.58)	27.3	(0.56)	2.3	(0.21)	2.7	(0.24)	7.7	(0.35)	1.4	(0.14)	7.5	(0.35)
Nonmetropolitan[6]	31.7	(0.67)	43.4	(1.47)	26.3	(1.32)	4.6	(0.53)	2.3	(0.32)	15.6	(1.39)	7.9	(0.77)	30.0	(0.88)	52.6	(1.30)	24.1	(1.14)	1.8	(0.27)	4.6	(0.78)	7.1	(0.74)	1.5	(0.31)	8.2	(0.84)
Family income (in current dollars)																												
Less than $10,000	55.9	(1.07)	30.9	(1.17)	39.9	(1.43)	4.2	(0.56)	0.6 !	(0.21)	18.7	(1.21)	5.8	(0.61)	46.2	(1.08)	41.3	(1.41)	40.9	(1.43)	1.3	(0.34)	1.2	(0.32)	8.4	(0.85)	0.7 !	(0.25)	6.2	(0.70)
$10,000 to $19,999	49.7	(0.78)	41.3	(1.08)	31.3	(1.15)	3.5	(0.39)	0.5	(0.13)	17.2	(0.90)	6.2	(0.53)	45.3	(0.85)	48.3	(1.21)	31.9	(1.17)	1.0	(0.25)	1.5	(0.33)	9.4	(0.78)	1.0	(0.24)	6.8	(0.58)
$20,000 to $29,999	39.7	(0.77)	40.5	(1.16)	32.3	(1.21)	4.1	(0.43)	1.0	(0.24)	14.9	(0.89)	7.3	(0.62)	35.9	(0.83)	48.8	(1.33)	29.7	(1.24)	1.3	(0.28)	1.2	(0.24)	8.5	(0.80)	1.3	(0.26)	9.2	(0.94)
$30,000 to $39,999	28.9	(0.75)	42.7	(1.35)	28.8	(1.46)	5.9	(0.67)	0.9 !	(0.29)	14.3	(0.92)	7.4	(0.71)	29.2	(0.71)	50.1	(1.42)	28.6	(1.38)	1.7	(0.34)	2.1	(0.43)	9.2	(1.03)	1.0	(0.23)	7.3	(0.88)
$40,000 to $49,999	18.8	(0.66)	41.5	(1.97)	26.6	(1.91)	6.4	(1.04)	1.4 !	(0.53)	15.4	(1.40)	8.7	(1.08)	22.2	(0.91)	52.7	(2.12)	24.2	(1.74)	3.2	(0.71)	4.0	(0.97)	6.7	(1.05)	1.8 !	(0.55)	7.3	(1.02)
$50,000 to $74,999	14.5	(0.45)	42.7	(1.61)	22.6	(1.55)	8.8	(1.05)	1.5	(0.41)	15.0	(1.16)	9.3	(1.10)	15.7	(0.45)	60.5	(1.55)	16.8	(1.20)	3.0	(0.53)	5.9	(0.87)	5.6	(0.79)	1.3	(0.35)	6.9	(0.80)
$75,000 to $99,999	8.7	(0.49)	43.7	(2.93)	20.8	(2.70)	9.6	(1.71)	2.9	(0.88)	13.9	(1.89)	9.1	(1.50)	12.4	(0.54)	58.3	(2.09)	16.2	(1.74)	5.2	(1.13)	4.6	(1.02)	5.1	(1.07)	1.9	(0.54)	8.7	(1.32)
$100,000 or more	4.8	(0.27)	44.1	(2.81)	20.8	(2.06)	10.5	(1.99)	3.5	(1.01)	9.5	(1.64)	11.6	(1.84)	10.0	(0.41)	57.0	(2.08)	15.7	(1.46)	3.7	(0.64)	6.3	(1.06)	5.1	(0.92)	3.3	(0.77)	9.0	(1.04)
$100,000 to $149,999	5.4	(0.40)	44.3	(3.56)	18.8	(2.55)	12.4	(2.69)	2.8 !	(1.24)	9.6	(2.08)	12.1	(2.31)	10.0	(0.53)	56.8	(2.61)	16.2	(2.02)	3.8	(0.87)	4.4	(1.09)	5.3	(1.10)	3.5	(0.96)	10.0	(1.45)
$150,000 or more	3.9	(0.37)	43.8	(4.30)	24.7	(4.18)	6.7 !	(2.12)	4.8 !	(2.12)	9.4	(2.67)	10.7	(2.89)	10.1	(0.62)	57.2	(3.02)	15.1	(2.17)	3.6	(1.01)	8.6	(1.82)	4.8	(1.42)	3.0 !	(1.21)	7.7	(1.76)

See notes at end of table.

Table 10.1. Percentage of persons age 3 and over and ages 3 to 18 with no internet access at home and percentage distribution of those with no home access, by main reason for not having access and selected characteristics: 2010 and 2015—Continued

[Standard errors appear in parentheses]

Selected characteristic	2010[1]														2015															
	Percent with no access at home		Percentage distribution of those with no home access, by main reason for not having access[2]												Percent with no access at home		Percentage distribution of those with no home access, by main reason for not having access[2]													
			Don't need it, not interested		Too expensive		Can use it somewhere else		Not available in area		No computer or computer inadequate		Other reasons[3]				Don't need it, not interested		Too expensive		Can use it somewhere else		Not available in area		No computer or computer inadequate		Privacy or security concerns		Other reasons[3]	
1	2		3		4		5		6		7		8		9		10		11		12		13		14		15		16	
Total, all 3- to 18-year-olds	**20.8**	**(0.43)**	**21.6**	**(0.99)**	**46.5**	**(1.23)**	**6.1**	**(0.57)**	**1.5**	**(0.23)**	**16.6**	**(0.98)**	**7.6**	**(0.56)**	**19.1**	**(0.42)**	**37.7**	**(1.06)**	**37.9**	**(1.14)**	**2.6**	**(0.36)**	**4.9**	**(0.53)**	**8.3**	**(0.64)**	**1.6**	**(0.32)**	**7.1**	**(0.71)**
Sex																														
Male	20.7	(0.48)	22.3	(1.18)	45.9	(1.48)	6.7	(0.68)	1.1	(0.22)	16.6	(1.10)	7.4	(0.64)	18.8	(0.48)	38.8	(1.33)	37.0	(1.29)	2.5	(0.45)	4.9	(0.66)	7.7	(0.70)	1.8	(0.42)	7.2	(0.83)
Female	20.9	(0.51)	20.9	(1.15)	47.2	(1.41)	5.5	(0.60)	1.9	(0.35)	16.6	(1.11)	7.9	(0.71)	19.4	(0.53)	36.5	(1.27)	38.9	(1.39)	2.6	(0.45)	4.9	(0.61)	8.9	(0.83)	1.4	(0.34)	6.9	(0.82)
Race/ethnicity																														
White	12.1	(0.47)	27.1	(1.97)	42.7	(2.04)	5.9	(0.81)	3.2	(0.57)	11.0	(1.01)	10.1	(1.15)	13.9	(0.50)	40.4	(1.73)	28.4	(1.61)	3.5	(0.68)	8.1	(1.05)	6.9	(0.91)	2.1	(0.59)	10.6	(1.35)
Black	35.4	(1.40)	17.6	(1.91)	48.9	(2.72)	7.0	(1.25)	1.0 !	(0.39)	20.1	(2.29)	5.4	(1.03)	26.3	(1.21)	31.9	(2.30)	46.2	(2.61)	2.5 !	(0.83)	2.7	(0.70)	10.4	(1.58)	2.3 !	(1.03)	4.0	(1.14)
Hispanic	34.6	(1.05)	19.2	(1.44)	48.8	(2.00)	4.9	(0.80)	‡	(†)	19.5	(1.56)	7.1	(0.90)	27.5	(0.96)	38.1	(2.07)	44.2	(2.14)	1.6 !	(0.58)	2.3	(0.53)	8.7	(1.26)	0.4 !	(0.20)	4.7	(0.87)
Asian	9.6	(1.36)	27.4	(6.70)	42.3	(7.95)	10.2 !	(3.75)	‡	(†)	11.8 !	(4.16)	8.4 !	(3.59)	12.9	(1.56)	47.4	(6.53)	24.6	(4.96)	‡	(†)	‡	(†)	5.9 !	(2.90)	‡	(†)	14.5 !	(4.86)
Pacific Islander	28.5 !	(9.49)	‡	(†)	69.0	(17.48)	‡	(†)	‡	(†)	‡	(†)	‡	(†)	24.9 !	(8.35)	‡	(†)	54.7	(21.36)	‡	(†)	‡	(†)	‡	(†)	‡	(†)	‡	(†)
American Indian/Alaska Native	38.7	(4.69)	26.3 !	(8.42)	41.0	(9.69)	11.7 !	(5.86)	‡	(†)	15.5 !	(6.31)	‡	(†)	28.2	(4.06)	22.2	(5.52)	54.6	(6.91)	‡	(†)	‡	(†)	8.0 !	(3.33)	‡	(†)	‡	(†)
Two or more races	20.8	(2.19)	20.3	(4.93)	42.7	(5.80)	12.2 !	(3.79)	‡	(†)	15.6	(4.28)	9.1 !	(3.36)	16.4	(1.71)	32.1	(4.99)	39.6	(5.16)	‡	(†)	‡	(†)	10.6 !	(3.72)	5.9 !	(2.83)	‡	(†)
Metropolitan status[4]																														
Metropolitan[5]	20.0	(0.47)	20.9	(1.06)	48.1	(1.37)	6.2	(0.62)	1.0	(0.23)	16.4	(1.06)	7.3	(0.63)	18.2	(0.44)	38.6	(1.14)	38.3	(1.26)	2.6	(0.40)	4.3	(0.52)	8.4	(0.71)	1.7	(0.38)	6.2	(0.68)
Nonmetropolitan[6]	25.1	(1.12)	24.8	(2.27)	39.9	(2.49)	6.0	(1.14)	3.7	(0.75)	16.5	(2.22)	9.0	(1.44)	24.6	(1.22)	34.6	(2.31)	36.3	(2.53)	2.4	(0.60)	7.3	(1.48)	7.3	(1.44)	1.2 !	(0.48)	10.8	(2.37)
Highest level of education attained by either parent[7]																														
Less than high school	54.1	(1.68)	21.6	(2.16)	47.3	(2.31)	3.3	(0.82)	‡	(†)	19.2	(1.91)	8.3	(1.26)	40.7	(1.80)	35.1	(2.78)	44.9	(3.23)	‡	(†)	1.6 !	(0.59)	8.6	(1.54)	‡	(†)	8.7	(2.00)
High school diploma or equivalent	32.3	(1.01)	20.0	(1.49)	48.1	(1.93)	5.5	(0.96)	1.0	(0.26)	17.8	(1.65)	7.5	(1.03)	27.6	(1.06)	36.1	(2.12)	41.7	(2.14)	2.1	(0.59)	3.9	(0.79)	9.5	(1.22)	‡	(†)	5.9	(1.15)
Some college	18.6	(0.91)	19.6	(2.27)	50.6	(2.63)	7.8	(1.37)	2.4 !	(0.79)	12.9	(1.89)	6.6	(1.39)	18.3	(0.93)	38.3	(2.90)	35.9	(3.06)	4.0	(1.13)	5.5	(1.38)	8.2	(1.43)	2.3 !	(1.11)	5.7	(1.39)
Associate's degree	12.6	(0.89)	24.4	(3.29)	37.0	(3.95)	8.8	(1.97)	3.9 !	(1.41)	13.4	(2.45)	12.4	(2.15)	15.7	(1.06)	34.0	(3.44)	42.4	(3.45)	5.3	(1.51)	4.7 !	(1.46)	4.1 !	(1.29)	0.6 !	(0.26)	8.9	(2.14)
Bachelor's or higher degree	5.7	(0.39)	26.9	(3.20)	38.9	(3.73)	10.1	(2.08)	3.9 !	(1.27)	13.6	(2.15)	6.7	(1.70)	9.7	(0.52)	41.7	(2.31)	24.9	(2.27)	3.4	(0.92)	9.9	(1.75)	8.4	(1.69)	3.3 !	(1.06)	8.5	(1.41)
Bachelor's degree	7.2	(0.56)	23.3	(3.57)	40.9	(4.53)	11.2	(2.46)	4.6 !	(1.59)	13.8	(2.47)	6.3	(1.89)	10.7	(0.70)	41.9	(3.19)	25.7	(2.88)	4.7 !	(1.41)	10.1	(2.05)	7.1	(2.01)	‡	(†)	8.8	(1.86)
Master's or higher degree	3.5	(0.46)	37.8	(6.44)	32.7	(6.27)	6.8 !	(3.00)	‡	(†)	13.0 !	(4.51)	7.9 !	(3.46)	8.5	(0.66)	41.4	(3.90)	23.6	(3.52)	‡	(†)	9.7	(2.46)	10.5 !	(3.16)	5.6 !	(2.13)	8.0	(1.81)
Family income (in current dollars)																														
Less than $10,000	56.5	(1.82)	13.2	(1.53)	54.6	(2.52)	4.7	(1.11)	‡	(†)	22.8	(2.23)	4.0	(0.88)	39.4	(2.14)	24.7	(2.68)	57.4	(3.47)	‡	(†)	1.7 !	(0.78)	10.0	(1.93)	‡	(†)	4.0 !	(1.72)
$10,000 to $19,999	43.3	(1.50)	22.1	(2.06)	47.3	(2.36)	5.7	(0.96)	0.7 !	(0.29)	18.5	(2.10)	5.8	(0.98)	38.0	(1.78)	32.8	(2.89)	47.4	(2.94)	1.7 !	(0.66)	3.0 !	(0.99)	10.3	(1.81)	‡	(†)	4.0	(1.13)
$20,000 to $29,999	35.7	(1.52)	20.3	(1.81)	49.2	(2.42)	5.4	(0.97)	1.2 !	(0.46)	15.6	(1.76)	8.4	(1.34)	29.9	(1.54)	33.9	(2.89)	44.4	(3.08)	1.3 !	(0.64)	1.2 !	(0.48)	8.3	(1.70)	‡	(†)	10.0	(2.44)
$30,000 to $39,999	23.6	(1.23)	27.4	(2.76)	44.7	(3.26)	6.2	(1.27)	1.4 !	(0.63)	11.7	(1.62)	8.6	(1.62)	23.8	(1.35)	32.6	(2.80)	42.2	(3.25)	1.6 !	(0.66)	4.0	(1.17)	11.1	(2.19)	‡	(†)	8.3	(2.10)
$40,000 to $49,999	14.3	(1.13)	22.1	(3.66)	48.2	(4.07)	6.8	(2.04)	‡	(†)	11.1	(2.47)	9.1	(2.51)	20.3	(1.55)	45.6	(4.19)	31.6	(3.71)	3.5 !	(1.42)	5.7 !	(1.85)	7.4 !	(2.52)	‡	(†)	4.0 !	(1.58)
$50,000 to $74,999	11.9	(0.77)	27.4	(2.95)	32.9	(3.20)	8.3	(2.01)	2.5 !	(0.92)	15.4	(2.56)	13.5	(2.46)	13.6	(0.84)	49.4	(3.42)	22.7	(2.53)	4.2 !	(1.34)	8.8	(2.22)	5.7	(1.33)	‡	(†)	8.1	(1.97)
$75,000 to $99,999	6.9	(0.73)	34.5	(5.09)	34.8	(5.64)	7.5 !	(2.38)	4.1 !	(1.98)	9.7	(2.55)	9.4 !	(2.98)	10.4	(0.92)	49.2	(4.08)	20.5	(3.75)	7.5 !	(2.53)	8.1 !	(2.45)	‡	(†)	‡	(†)	8.5	(2.48)
$100,000 or more	3.0	(0.36)	26.1	(5.98)	32.4	(5.51)	13.2 !	(4.41)	7.7 !	(3.17)	6.8 !	(2.35)	13.9 !	(4.73)	9.0	(0.61)	44.7	(3.37)	20.4	(2.64)	3.0 !	(0.91)	10.6	(2.12)	5.6	(1.66)	5.8 !	(1.92)	10.0	(1.89)
$100,000 to $149,999	3.6	(0.54)	26.2	(6.88)	27.9	(6.61)	17.9 !	(6.03)	‡	(†)	7.9 !	(3.08)	13.5 !	(6.08)	8.4	(0.77)	43.0	(4.62)	22.6	(3.97)	3.3 !	(1.29)	6.7	(1.97)	5.5 !	(2.56)	5.9 !	(2.30)	13.0	(2.86)
$150,000 or more	2.2	(0.56)	25.9	(9.86)	42.1	(9.79)	‡	(†)	‡	(†)	‡	(†)	‡	(†)	9.8	(0.98)	46.3	(5.06)	18.1	(3.91)	‡	(†)	14.7	(3.60)	5.7 !	(2.18)	‡	(†)	6.8 !	(2.94)

†Not applicable.
!Interpret data with caution. The coefficient of variation (CV) for this estimate is between 30 and 50 percent.
‡Reporting standards not met. Either there are too few cases for a reliable estimate or the coefficient of variation (CV) is 50 percent or greater.
[1]In 2010, the reasons that respondents could choose from did not include privacy or security concerns.
[2]Includes only persons living in homes with no internet access.
[3]Respondents could specify "other" reasons. Examples of other reasons were not provided to respondents.
[4]Persons living in areas whose metropolitan status was not identified are excluded from this analysis. In 2010 and 2015, less than 1 percent of persons lived in an area with non-identified metropolitan status.
[5]Refers to metropolitan statistical areas, which contain at least one urbanized area with a population of 50,000 or more.
[6]Refers to areas that are outside of metropolitan statistical areas.
[7]Highest education level of any parent residing with the child (including an adoptive or stepparent). Includes only children who resided with at least one of their parents.
NOTE: Data are based on sample surveys of the civilian noninstitutionalized population, which excludes persons in the military and persons living in institutions (e.g., prisons or nursing facilities). Data for 2015 were collected in the July supplement to the Current Population Survey (CPS), while data for 2010 were collected in the October supplement. The July supplement consists solely of questions about computer and internet use. In contrast, the October supplement focuses on school enrollment, although it also includes questions about computer and internet use. Measurable differences in estimates across years could reflect actual changes in the population; however, differences could also reflect seasonal variations in data collection or differences between the content of the July and October supplements. Therefore, caution should be used when making year-to-year comparisons. Detail may not sum to totals because of rounding. Race categories exclude persons of Hispanic ethnicity.
SOURCE: U.S. Department of Commerce, Census Bureau, Current Population Survey (CPS), October 2010 and July 2015. (This table was prepared December 2016.)

Table 11.1. Number and percentage distribution of 5- to 17-year-old students, by home internet access, poverty status, and locale: 2015

[Standard errors appear in parentheses]

Poverty status and locale	Number of students with known poverty status living in households[1] (in thousands)		Percentage distribution of students,[1] by home access to the Internet[2]									
					Access with a broadband subscription						Either no access or only dial-up access	
			Total		Total, any broadband subscription		Fixed broadband (of any sort)[3]		Mobile broadband (alone or with dial-up)		Access without a subscription[4]	
1	2		3		4		5		6		7	8
Total	**51,275**	**(23.8)**	**100.0**	**(†)**	**85.0**	**(0.09)**	**77.8**	**(0.11)**	**7.3**	**(0.06)**	**4.2**	**(0.04)**	**10.8**	**(0.08)**
City	15,591	(24.2)	100.0	(†)	81.7	(0.15)	74.1	(0.16)	7.6	(0.09)	5.1	(0.09)	13.2	(0.13)
Large	8,755	(16.4)	100.0	(†)	80.0	(0.22)	72.1	(0.23)	7.9	(0.13)	5.3	(0.11)	14.7	(0.20)
Midsize	3,344	(16.2)	100.0	(†)	83.5	(0.26)	76.1	(0.34)	7.4	(0.23)	4.7	(0.21)	11.8	(0.22)
Small	3,492	(13.3)	100.0	(†)	84.3	(0.29)	77.1	(0.33)	7.2	(0.19)	4.8	(0.19)	11.0	(0.27)
Suburb	21,381	(34.3)	100.0	(†)	89.8	(0.11)	84.5	(0.12)	5.3	(0.08)	3.0	(0.06)	7.2	(0.10)
Large	18,283	(30.4)	100.0	(†)	90.1	(0.12)	85.0	(0.13)	5.1	(0.08)	2.9	(0.06)	7.0	(0.10)
Midsize	1,984	(13.8)	100.0	(†)	87.6	(0.36)	81.8	(0.44)	5.9	(0.26)	3.9	(0.23)	8.4	(0.31)
Small	1,115	(12.0)	100.0	(†)	88.2	(0.49)	80.8	(0.54)	7.4	(0.39)	3.2	(0.22)	8.6	(0.44)
Town	4,772	(36.7)	100.0	(†)	80.9	(0.29)	72.2	(0.34)	8.7	(0.20)	5.3	(0.16)	13.8	(0.25)
Fringe	1,323	(12.9)	100.0	(†)	84.5	(0.46)	77.0	(0.52)	7.4	(0.37)	4.8	(0.27)	10.7	(0.39)
Distant	2,161	(21.8)	100.0	(†)	79.3	(0.37)	70.1	(0.43)	9.3	(0.27)	5.5	(0.22)	15.2	(0.32)
Remote	1,288	(15.6)	100.0	(†)	80.0	(0.52)	70.9	(0.63)	9.1	(0.39)	5.6	(0.27)	14.4	(0.42)
Rural	9,531	(40.0)	100.0	(†)	81.8	(0.16)	71.5	(0.22)	10.3	(0.13)	4.8	(0.07)	13.4	(0.16)
Fringe	4,665	(22.9)	100.0	(†)	85.9	(0.24)	77.2	(0.32)	8.6	(0.18)	4.1	(0.11)	10.1	(0.22)
Distant	3,808	(27.8)	100.0	(†)	78.6	(0.25)	66.3	(0.30)	12.3	(0.20)	5.4	(0.13)	16.0	(0.25)
Remote	1,057	(14.0)	100.0	(†)	75.5	(0.45)	64.6	(0.44)	11.0	(0.30)	6.0	(0.25)	18.5	(0.39)
Below poverty threshold[5]	10,105	(57.7)	100.0	(†)	65.5	(0.21)	54.7	(0.25)	10.9	(0.16)	8.1	(0.13)	26.4	(0.19)
City	4,131	(28.2)	100.0	(†)	63.8	(0.37)	52.7	(0.41)	11.1	(0.22)	8.8	(0.23)	27.4	(0.33)
Large	2,486	(19.6)	100.0	(†)	62.7	(0.48)	51.7	(0.55)	11.0	(0.29)	8.8	(0.30)	28.5	(0.45)
Midsize	817	(12.4)	100.0	(†)	64.7	(0.76)	53.6	(0.83)	11.1	(0.55)	9.3	(0.57)	26.0	(0.71)
Small	828	(13.2)	100.0	(†)	66.3	(0.83)	55.0	(0.88)	11.4	(0.52)	8.4	(0.46)	25.2	(0.81)
Suburb	3,168	(30.3)	100.0	(†)	71.0	(0.41)	61.9	(0.40)	9.2	(0.28)	6.8	(0.22)	22.2	(0.39)
Large	2,614	(28.4)	100.0	(†)	71.0	(0.42)	62.3	(0.43)	8.7	(0.29)	6.8	(0.25)	22.2	(0.42)
Midsize	345	(9.7)	100.0	(†)	68.7	(1.24)	58.0	(1.42)	10.7	(1.03)	8.2	(0.75)	23.1	(1.16)
Small	208	(8.2)	100.0	(†)	74.4	(1.65)	62.1	(1.80)	12.3	(1.32)	5.3	(0.80)	20.3	(1.55)
Town	1,195	(23.1)	100.0	(†)	62.8	(0.65)	50.7	(0.64)	12.1	(0.51)	8.4	(0.43)	28.8	(0.61)
Fringe	272	(8.9)	100.0	(†)	67.7	(1.42)	56.6	(1.47)	11.1	(0.99)	7.7	(0.77)	24.6	(1.33)
Distant	592	(13.6)	100.0	(†)	60.1	(0.87)	47.9	(0.88)	12.3	(0.62)	9.1	(0.55)	30.8	(0.90)
Remote	330	(9.0)	100.0	(†)	63.4	(1.28)	51.0	(1.33)	12.4	(0.92)	7.9	(0.68)	28.7	(1.08)
Rural	1,611	(16.4)	100.0	(†)	61.3	(0.52)	48.6	(0.50)	12.7	(0.41)	8.2	(0.27)	30.5	(0.53)
Fringe	625	(12.4)	100.0	(†)	64.2	(0.87)	52.6	(0.90)	11.6	(0.66)	7.8	(0.46)	28.0	(0.86)
Distant	731	(11.0)	100.0	(†)	60.6	(0.78)	46.6	(0.79)	14.0	(0.59)	8.5	(0.42)	30.9	(0.79)
Remote	255	(5.6)	100.0	(†)	56.1	(1.30)	44.4	(1.22)	11.7	(0.69)	8.7	(0.72)	35.2	(1.21)
100 to 185 percent of poverty threshold[5]	9,800	(50.7)	100.0	(†)	79.1	(0.19)	70.0	(0.21)	9.0	(0.14)	5.7	(0.10)	15.3	(0.17)
City	3,362	(27.1)	100.0	(†)	77.9	(0.35)	68.7	(0.37)	9.3	(0.22)	6.0	(0.22)	16.1	(0.31)
Large	1,948	(21.6)	100.0	(†)	76.5	(0.46)	67.2	(0.45)	9.3	(0.31)	6.2	(0.26)	17.4	(0.40)
Midsize	716	(11.1)	100.0	(†)	79.6	(0.68)	70.1	(0.84)	9.6	(0.61)	5.8	(0.45)	14.6	(0.65)
Small	699	(13.3)	100.0	(†)	80.1	(0.76)	71.2	(1.00)	8.9	(0.62)	5.5	(0.53)	14.3	(0.59)
Suburb	3,532	(30.7)	100.0	(†)	83.3	(0.35)	76.0	(0.40)	7.3	(0.24)	4.7	(0.18)	12.1	(0.30)
Large	2,970	(27.6)	100.0	(†)	83.6	(0.36)	76.4	(0.43)	7.2	(0.26)	4.5	(0.19)	11.9	(0.32)
Midsize	357	(8.8)	100.0	(†)	81.4	(0.88)	73.5	(1.13)	7.9	(0.75)	5.8	(0.62)	12.8	(0.76)
Small	206	(7.2)	100.0	(†)	82.0	(1.44)	74.1	(1.58)	7.9	(0.94)	4.6	(0.57)	13.4	(1.21)
Town	1,094	(17.1)	100.0	(†)	77.0	(0.52)	66.8	(0.62)	10.2	(0.45)	6.8	(0.37)	16.2	(0.51)
Fringe	264	(8.8)	100.0	(†)	78.1	(1.36)	69.1	(1.73)	9.1	(0.91)	6.7	(0.77)	15.2	(1.13)
Distant	520	(10.7)	100.0	(†)	76.9	(0.81)	66.9	(0.87)	10.0	(0.61)	6.5	(0.51)	16.7	(0.72)
Remote	310	(8.4)	100.0	(†)	76.3	(1.05)	64.7	(1.21)	11.6	(0.87)	7.5	(0.67)	16.2	(0.86)
Rural	1,812	(13.6)	100.0	(†)	74.3	(0.44)	63.0	(0.48)	11.3	(0.34)	6.3	(0.19)	19.4	(0.40)
Fringe	763	(11.7)	100.0	(†)	77.4	(0.67)	66.8	(0.82)	10.7	(0.58)	5.6	(0.32)	17.0	(0.63)
Distant	796	(9.5)	100.0	(†)	72.2	(0.63)	60.2	(0.69)	11.9	(0.53)	6.7	(0.30)	21.1	(0.59)
Remote	254	(5.6)	100.0	(†)	71.3	(0.94)	60.2	(1.00)	11.1	(0.62)	7.2	(0.64)	21.5	(0.86)
Greater than 185 percent of poverty threshold[5]	31,369	(66.5)	100.0	(†)	93.1	(0.06)	87.6	(0.09)	5.6	(0.06)	2.5	(0.04)	4.4	(0.06)
City	8,097	(33.2)	100.0	(†)	92.4	(0.13)	87.2	(0.17)	5.2	(0.12)	2.8	(0.09)	4.8	(0.10)
Large	4,320	(24.7)	100.0	(†)	91.6	(0.20)	86.1	(0.26)	5.5	(0.18)	2.9	(0.13)	5.5	(0.15)
Midsize	1,812	(15.1)	100.0	(†)	93.6	(0.28)	88.6	(0.36)	4.9	(0.21)	2.2	(0.17)	4.3	(0.22)
Small	1,965	(14.5)	100.0	(†)	93.3	(0.28)	88.5	(0.34)	4.8	(0.22)	3.0	(0.20)	3.7	(0.18)
Suburb	14,681	(34.7)	100.0	(†)	95.4	(0.08)	91.4	(0.11)	4.0	(0.07)	1.8	(0.05)	2.8	(0.06)
Large	12,699	(32.6)	100.0	(†)	95.5	(0.08)	91.6	(0.11)	3.9	(0.07)	1.8	(0.06)	2.7	(0.06)
Midsize	1,282	(12.5)	100.0	(†)	94.5	(0.31)	90.5	(0.41)	4.0	(0.26)	2.3	(0.21)	3.2	(0.23)
Small	700	(9.7)	100.0	(†)	94.1	(0.42)	88.4	(0.55)	5.7	(0.41)	2.2	(0.27)	3.7	(0.35)
Town	2,483	(18.1)	100.0	(†)	91.4	(0.23)	85.0	(0.33)	6.4	(0.23)	3.2	(0.18)	5.4	(0.20)
Fringe	787	(9.5)	100.0	(†)	92.4	(0.45)	86.8	(0.64)	5.6	(0.45)	3.2	(0.32)	4.4	(0.37)
Distant	1,049	(11.2)	100.0	(†)	91.4	(0.34)	84.2	(0.43)	7.2	(0.31)	2.9	(0.24)	5.7	(0.30)
Remote	648	(7.7)	100.0	(†)	90.2	(0.51)	84.1	(0.58)	6.2	(0.37)	3.6	(0.30)	6.2	(0.40)
Rural	6,107	(39.5)	100.0	(†)	89.4	(0.15)	80.0	(0.23)	9.4	(0.16)	3.5	(0.09)	7.1	(0.13)
Fringe	3,278	(20.5)	100.0	(†)	92.0	(0.19)	84.4	(0.27)	7.6	(0.21)	3.0	(0.13)	5.0	(0.17)
Distant	2,281	(24.0)	100.0	(†)	86.5	(0.27)	74.7	(0.36)	11.8	(0.25)	4.0	(0.15)	9.5	(0.25)
Remote	549	(9.2)	100.0	(†)	86.5	(0.50)	75.9	(0.64)	10.6	(0.51)	4.2	(0.28)	9.3	(0.36)

†Not applicable.

[1]Includes students who are 5 to 17 years old, live in a household, and are in the poverty universe. The poverty universe includes all children who are related to the householder by birth, marriage, or adoption and includes unrelated children age 15 and over. The householder is the person (or one of the people) who owns or rents (maintains) the housing unit. Poverty status is determined by the total family income of the householder for related children and individual income for unrelated children. Poverty status cannot be determined for unrelated children under age 15 (e.g., foster children) because their family and individual income is not known.

[2]Percentages refer to students whose household members access the Internet at home by the means specified. "Either no access or only dial-up access" includes households where no member accesses the Internet at home as well as households where members access the Internet only with a dial-up service.

[3]Excludes mobile broadband, but includes all other non-dial-up internet service, such as DSL, cable modem, and fiber-optic cable.

[4]Includes respondents living in a city or town that provides free internet services for its residents.

[5]Students are considered to be in poverty if their family income falls below the Census Bureau's poverty threshold, which is a dollar amount that varies depending on a family's size and composition and is updated annually to account for inflation. In 2015, for example, the poverty threshold for a family of four with two children was $24,036. Respondents were interviewed throughout the year and reported on the income they received during the previous 12 months.

NOTE: Data are based on sample surveys of the entire population residing within the United States. However, this table includes only students living in households, because respondents living in group quarters (e.g., shelters, healthcare facilities, or correctional facilities) were not asked about internet access. Some students living in households were also excluded from this table, because their poverty status could not be determined (see footnote 1). As noted in footnote 5, the Census Bureau determines poverty status using a set of money income thresholds that vary by family size and composition. For additional information about poverty status, see https://www.census.gov/topics/income-poverty/poverty/guidance/poverty-measures.html. Detail may not sum to totals because of rounding.

SOURCE: U.S. Department of Commerce, Census Bureau, American Community Survey (ACS), 2015. (This table was prepared January 2017.)

Table 12.1. Number and percentage distribution of 5- to 17-year-old students, by home internet access, race/ethnicity, and locale: 2015

[Standard errors appear in parentheses]

Race/ethnicity and locale	Number of students living in households[1] (in thousands)		Percentage distribution of students,[1] by home access to the Internet[2]											
					Access with a broadband subscription									
			Total		Total, any broadband subscription		Fixed broadband (of any sort)[3]		Mobile broadband (alone or with dial-up)		Access without a subscription[4]		Either no access or only dial-up access	
1	2		3		4		5		6		7		8	
Total[5]	**51,937**	**(20.4)**	**100.0**	**(†)**	**85.0**	**(0.08)**	**77.7**	**(0.11)**	**7.3**	**(0.06)**	**4.2**	**(0.04)**	**10.8**	**(0.08)**
City	15,776	(24.9)	100.0	(†)	81.7	(0.14)	74.0	(0.16)	7.7	(0.09)	5.1	(0.09)	13.3	(0.13)
Large	8,849	(16.3)	100.0	(†)	80.0	(0.22)	72.1	(0.23)	7.9	(0.13)	5.3	(0.11)	14.7	(0.20)
Midsize	3,385	(16.3)	100.0	(†)	83.5	(0.25)	76.1	(0.33)	7.4	(0.23)	4.7	(0.21)	11.8	(0.22)
Small	3,542	(13.1)	100.0	(†)	84.2	(0.29)	77.0	(0.33)	7.2	(0.19)	4.8	(0.19)	11.0	(0.27)
Suburb	21,616	(32.7)	100.0	(†)	89.7	(0.11)	84.4	(0.12)	5.3	(0.08)	3.1	(0.06)	7.2	(0.09)
Large	18,472	(29.3)	100.0	(†)	90.1	(0.11)	84.9	(0.13)	5.1	(0.08)	3.0	(0.06)	7.0	(0.10)
Midsize	2,014	(14.0)	100.0	(†)	87.6	(0.36)	81.8	(0.43)	5.9	(0.26)	3.9	(0.23)	8.5	(0.30)
Small	1,131	(12.0)	100.0	(†)	88.2	(0.49)	80.9	(0.54)	7.3	(0.37)	3.2	(0.22)	8.6	(0.44)
Town	4,849	(37.2)	100.0	(†)	80.9	(0.28)	72.2	(0.34)	8.7	(0.20)	5.3	(0.15)	13.8	(0.25)
Fringe	1,343	(13.0)	100.0	(†)	84.4	(0.46)	76.9	(0.51)	7.5	(0.36)	4.9	(0.27)	10.8	(0.39)
Distant	2,198	(22.0)	100.0	(†)	79.3	(0.37)	70.1	(0.42)	9.3	(0.27)	5.5	(0.22)	15.2	(0.32)
Remote	1,308	(15.6)	100.0	(†)	80.0	(0.52)	70.9	(0.63)	9.1	(0.39)	5.6	(0.27)	14.4	(0.42)
Rural	9,696	(40.4)	100.0	(†)	81.8	(0.16)	71.4	(0.22)	10.4	(0.13)	4.9	(0.07)	13.4	(0.16)
Fringe	4,737	(23.7)	100.0	(†)	85.8	(0.24)	77.2	(0.32)	8.6	(0.19)	4.1	(0.12)	10.1	(0.22)
Distant	3,881	(28.2)	100.0	(†)	78.5	(0.24)	66.2	(0.30)	12.3	(0.20)	5.4	(0.13)	16.0	(0.24)
Remote	1,077	(14.2)	100.0	(†)	75.5	(0.45)	64.5	(0.45)	11.0	(0.31)	6.0	(0.25)	18.5	(0.39)
White	26,966	(13.0)	100.0	(†)	90.2	(0.09)	84.0	(0.12)	6.3	(0.07)	3.2	(0.05)	6.6	(0.07)
City	5,233	(18.4)	100.0	(†)	91.2	(0.19)	86.2	(0.21)	4.9	(0.13)	3.2	(0.12)	5.7	(0.17)
Large	2,296	(12.0)	100.0	(†)	90.9	(0.25)	86.2	(0.29)	4.7	(0.18)	2.9	(0.13)	6.3	(0.23)
Midsize	1,249	(11.0)	100.0	(†)	92.8	(0.32)	87.8	(0.44)	5.1	(0.29)	2.6	(0.26)	4.6	(0.21)
Small	1,688	(11.0)	100.0	(†)	90.3	(0.32)	85.2	(0.41)	5.2	(0.26)	4.1	(0.23)	5.6	(0.24)
Suburb	11,298	(26.5)	100.0	(†)	94.4	(0.10)	90.4	(0.13)	4.1	(0.09)	2.1	(0.06)	3.5	(0.08)
Large	9,367	(24.8)	100.0	(†)	95.0	(0.10)	91.2	(0.13)	3.8	(0.09)	1.9	(0.06)	3.1	(0.08)
Midsize	1,223	(10.2)	100.0	(†)	92.0	(0.36)	87.4	(0.44)	4.7	(0.31)	3.0	(0.24)	5.0	(0.34)
Small	707	(9.7)	100.0	(†)	91.9	(0.52)	85.6	(0.65)	6.3	(0.47)	2.6	(0.28)	5.5	(0.44)
Town	2,897	(22.7)	100.0	(†)	86.6	(0.30)	79.4	(0.39)	7.2	(0.21)	4.5	(0.20)	8.9	(0.27)
Fringe	842	(11.9)	100.0	(†)	89.1	(0.48)	82.6	(0.60)	6.5	(0.36)	4.3	(0.37)	6.7	(0.37)
Distant	1,320	(14.0)	100.0	(†)	85.1	(0.43)	77.5	(0.49)	7.5	(0.34)	4.8	(0.25)	10.2	(0.35)
Remote	735	(10.6)	100.0	(†)	86.6	(0.57)	79.1	(0.71)	7.5	(0.43)	4.1	(0.26)	9.3	(0.53)
Rural	7,539	(27.8)	100.0	(†)	84.6	(0.18)	74.6	(0.23)	10.1	(0.13)	4.5	(0.07)	10.9	(0.16)
Fringe	3,655	(17.8)	100.0	(†)	88.4	(0.24)	80.2	(0.31)	8.2	(0.18)	3.8	(0.13)	7.8	(0.20)
Distant	3,116	(21.1)	100.0	(†)	81.1	(0.27)	68.9	(0.33)	12.2	(0.21)	5.0	(0.14)	13.9	(0.25)
Remote	769	(9.9)	100.0	(†)	81.3	(0.43)	70.8	(0.50)	10.5	(0.38)	5.8	(0.25)	12.9	(0.34)
Black	7,044	(19.2)	100.0	(†)	74.2	(0.23)	65.8	(0.27)	8.4	(0.17)	6.9	(0.16)	18.9	(0.22)
City	3,292	(16.1)	100.0	(†)	71.0	(0.31)	61.3	(0.37)	9.7	(0.27)	7.9	(0.24)	21.1	(0.33)
Large	2,022	(9.2)	100.0	(†)	70.5	(0.48)	61.4	(0.54)	9.1	(0.35)	8.4	(0.31)	21.1	(0.41)
Midsize	710	(8.5)	100.0	(†)	72.8	(0.81)	62.6	(0.89)	10.3	(0.50)	7.3	(0.51)	19.9	(0.76)
Small	560	(8.8)	100.0	(†)	70.5	(0.76)	59.6	(0.89)	10.9	(0.62)	6.9	(0.56)	22.6	(0.79)
Suburb	2,636	(16.3)	100.0	(†)	82.3	(0.40)	75.6	(0.43)	6.7	(0.24)	5.2	(0.25)	12.5	(0.34)
Large	2,364	(14.2)	100.0	(†)	82.5	(0.39)	76.2	(0.45)	6.3	(0.27)	5.2	(0.25)	12.4	(0.33)
Midsize	184	(6.2)	100.0	(†)	80.4	(1.63)	70.4	(1.79)	10.0	(1.32)	5.6	(0.89)	14.0	(1.52)
Small	88	(4.7)	100.0	(†)	80.9	(2.08)	72.0	(2.29)	8.9	(1.35)	5.2	(1.22)	13.9	(1.79)
Town	535	(11.0)	100.0	(†)	63.0	(1.12)	52.7	(1.14)	10.3	(0.54)	9.2	(0.63)	27.9	(0.89)
Fringe	111	(5.7)	100.0	(†)	70.5	(2.17)	62.3	(2.23)	8.2	(1.33)	9.4	(1.45)	20.2	(2.06)
Distant	287	(7.0)	100.0	(†)	62.9	(1.41)	51.4	(1.32)	11.4	(0.76)	8.1	(0.82)	29.0	(1.20)
Remote	137	(3.9)	100.0	(†)	57.2	(2.26)	47.5	(2.23)	9.7	(0.99)	11.2	(1.59)	31.7	(1.86)
Rural	581	(10.4)	100.0	(†)	66.0	(0.98)	58.2	(1.03)	7.8	(0.53)	6.9	(0.49)	27.1	(0.85)
Fringe	278	(8.4)	100.0	(†)	74.3	(1.38)	67.6	(1.56)	6.7	(0.75)	5.5	(0.71)	20.2	(1.26)
Distant	235	(7.0)	100.0	(†)	60.6	(1.31)	51.4	(1.45)	9.2	(0.74)	8.3	(0.80)	31.1	(1.25)
Remote	68	(2.9)	100.0	(†)	50.9	(2.96)	43.1	(2.74)	7.7	(1.35)	7.6	(1.11)	41.5	(3.10)
Hispanic	12,591	(10.7)	100.0	(†)	77.7	(0.19)	68.1	(0.24)	9.6	(0.14)	5.3	(0.10)	17.0	(0.18)
City	5,327	(18.9)	100.0	(†)	75.9	(0.27)	66.0	(0.33)	9.9	(0.20)	5.8	(0.17)	18.4	(0.26)
Large	3,465	(14.2)	100.0	(†)	75.2	(0.35)	65.1	(0.42)	10.1	(0.25)	5.8	(0.20)	19.0	(0.36)
Midsize	1,019	(8.0)	100.0	(†)	77.0	(0.65)	67.7	(0.70)	9.3	(0.45)	5.8	(0.33)	17.2	(0.56)
Small	842	(10.0)	100.0	(†)	77.2	(0.73)	67.8	(0.83)	9.5	(0.47)	5.8	(0.43)	17.0	(0.77)
Suburb	5,266	(17.2)	100.0	(†)	81.5	(0.30)	73.4	(0.32)	8.0	(0.19)	4.4	(0.14)	14.1	(0.27)
Large	4,604	(16.0)	100.0	(†)	82.0	(0.33)	74.1	(0.35)	7.9	(0.20)	4.3	(0.15)	13.7	(0.28)
Midsize	426	(7.8)	100.0	(†)	76.8	(1.07)	68.8	(1.22)	8.0	(0.64)	6.1	(0.63)	17.1	(0.87)
Small	236	(6.4)	100.0	(†)	79.0	(1.63)	67.8	(1.68)	11.1	(0.97)	4.2	(0.57)	16.8	(1.64)
Town	1,062	(13.3)	100.0	(†)	73.8	(0.62)	61.6	(0.70)	12.1	(0.53)	5.9	(0.40)	20.3	(0.58)
Fringe	299	(6.9)	100.0	(†)	74.8	(1.29)	64.3	(1.31)	10.4	(0.98)	5.4	(0.64)	19.9	(1.19)
Distant	451	(9.1)	100.0	(†)	72.3	(0.92)	59.3	(0.98)	13.0	(0.75)	5.9	(0.47)	21.8	(0.94)
Remote	312	(5.5)	100.0	(†)	74.9	(1.10)	62.4	(1.24)	12.4	(0.87)	6.5	(0.68)	18.6	(0.94)
Rural	937	(12.9)	100.0	(†)	71.5	(0.67)	57.5	(0.73)	14.0	(0.55)	6.4	(0.38)	22.2	(0.64)
Fringe	514	(12.0)	100.0	(†)	73.6	(0.89)	60.4	(1.00)	13.2	(0.80)	5.8	(0.45)	20.7	(0.82)
Distant	318	(7.7)	100.0	(†)	69.8	(1.14)	54.2	(1.21)	15.6	(0.92)	7.1	(0.54)	23.1	(1.14)
Remote	105	(3.4)	100.0	(†)	66.1	(1.48)	53.1	(1.60)	13.0	(0.96)	7.5	(1.12)	26.5	(1.41)

See notes at end of table.

Table 12.1. Number and percentage distribution of 5- to 17-year-old students, by home internet access, race/ethnicity, and locale: 2015—Continued

[Standard errors appear in parentheses]

Race/ethnicity and locale	Number of students living in households[1] (in thousands)		Percentage distribution of students,[1] by home access to the Internet[2]											
					Access with a broadband subscription									
			Total		Total, any broadband subscription		Fixed broadband (of any sort)[3]		Mobile broadband (alone or with dial-up)		Access without a subscription[4]		Either no access or only dial-up access	
1	2		3		4		5		6		7		8	
Asian	2,462	(10.5)	100.0	(†)	95.0	(0.17)	91.4	(0.24)	3.5	(0.15)	1.6	(0.11)	3.4	(0.14)
City	1,033	(10.3)	100.0	(†)	93.6	(0.28)	89.8	(0.35)	3.9	(0.23)	1.9	(0.18)	4.5	(0.25)
Large	614	(7.2)	100.0	(†)	92.4	(0.42)	88.3	(0.51)	4.1	(0.33)	1.9	(0.26)	5.6	(0.39)
Midsize	197	(5.4)	100.0	(†)	94.8	(0.59)	91.7	(0.78)	3.1	(0.55)	2.1	(0.38)	3.1	(0.46)
Small	222	(4.5)	100.0	(†)	96.0	(0.57)	92.1	(0.86)	3.9	(0.62)	1.6	(0.31)	2.5	(0.42)
Suburb	1,273	(10.7)	100.0	(†)	96.4	(0.22)	93.2	(0.31)	3.2	(0.19)	1.3	(0.11)	2.3	(0.21)
Large	1,176	(9.8)	100.0	(†)	96.5	(0.23)	93.3	(0.31)	3.1	(0.22)	1.3	(0.11)	2.2	(0.21)
Midsize	60	(2.8)	100.0	(†)	95.0	(1.16)	90.7	(1.74)	4.3	(1.25)	2.6 !	(0.85)	2.4	(0.66)
Small	37	(2.4)	100.0	(†)	95.5	(1.50)	92.7	(2.05)	2.8 !	(1.04)	‡	(†)	3.4 !	(1.32)
Town	68	(3.0)	100.0	(†)	91.8	(1.14)	87.8	(1.47)	4.0	(1.02)	2.4	(0.54)	5.8	(0.99)
Fringe	19	(1.9)	100.0	(†)	95.6	(1.51)	93.8	(1.83)	‡	(†)	‡	(†)	3.4 !	(1.40)
Distant	26	(1.7)	100.0	(†)	90.4	(1.94)	84.7	(2.76)	5.7 !	(1.95)	3.1	(0.91)	6.6	(1.69)
Remote	23	(1.6)	100.0	(†)	90.5	(2.24)	86.6	(2.64)	3.9 !	(1.60)	2.6 !	(0.98)	6.9	(1.85)
Rural	88	(3.7)	100.0	(†)	92.5	(1.17)	87.9	(1.24)	4.6	(0.93)	2.2	(0.53)	5.3	(0.94)
Fringe	67	(3.3)	100.0	(†)	94.2	(1.07)	90.6	(1.32)	3.6 !	(1.11)	1.9	(0.49)	3.9	(0.89)
Distant	17	(1.5)	100.0	(†)	86.7	(3.58)	79.1	(3.69)	7.6	(1.75)	3.7 !	(1.81)	9.6 !	(3.21)
Remote	4	(0.6)	100.0	(†)	88.1	(3.00)	79.5	(4.08)	8.6 !	(3.15)	‡	(†)	10.9	(2.92)
Pacific Islander[6]	79	(3.0)	100.0	(†)	85.5	(2.12)	79.3	(2.49)	6.2	(1.30)	2.2 !	(1.05)	12.3	(1.75)
American Indian/Alaska Native[6]	385	(6.5)	100.0	(†)	66.5	(0.96)	55.7	(0.99)	10.7	(0.64)	6.6	(0.66)	26.9	(1.02)
Two or more races[6]	2,233	(23.8)	100.0	(†)	88.8	(0.39)	82.1	(0.49)	6.7	(0.28)	4.0	(0.24)	7.2	(0.30)

†Not applicable.
!Interpret data with caution. The coefficient of variation (CV) for this estimate is between 30 and 50 percent.
‡Reporting standards not met. Either there are too few cases for a reliable estimate or the coefficient of variation (CV) is 50 percent or greater.
[1]Includes all students who are 5 to 17 years old and live in a household.
[2]Percentages refer to students whose household members access the Internet at home by the means specified. "Either no access or only dial-up access" includes households where no member accesses the Internet at home as well as households where members access the Internet only with a dial-up service.
[3]Excludes mobile broadband, but includes all other non-dial-up internet service, such as DSL, cable modem, and fiber-optic cable.
[4]Includes respondents living in a city or town that provides free internet services for its residents.
[5]Total includes other racial/ethnic groups not shown separately.
[6]Data for this race category cannot be broken out by locale.
NOTE: Data are based on sample surveys of the entire population residing within the United States. However, this table includes only students living in households, because respondents living in group quarters (e.g., shelters, healthcare facilities, or correctional facilities) were not asked about internet access. Race categories exclude persons of Hispanic ethnicity. Detail may not sum to totals because of rounding.
SOURCE: U.S. Department of Commerce, Census Bureau, American Community Survey (ACS), 2015. (This table was prepared January 2017.)

Table 13.1. Percentage of 4th-, 8th-, and 12th-grade public school students with their own or a shared digital device at home, by selected student and school characteristics: 2015

[Standard errors appear in parentheses]

Selected student or school characteristic	4th-graders		8th-graders		12th-graders	
1		2		3		4
Total	**95.0**	**(0.33)**	**98.3**	**(0.2)**	**98.0**	**(0.20)**
Sex						
Male	94.2	(0.51)	98.0	(0.3)	97.8	(0.30)
Female	95.9	(0.43)	98.7	(0.2)	98.3	(0.27)
Race/ethnicity						
White	96.5	(0.43)	98.8	(0.2)	98.6	(0.25)
Black	93.1	(0.84)	98.0	(0.5)	96.7	(0.56)
Hispanic	93.6	(0.72)	97.9	(0.4)	98.1	(0.41)
Asian	99.0	(0.72)	99.3	(0.5)	98.4	(0.79)
Pacific Islander	‡	(†)	‡	(†)	95.5	(1.96)
American Indian/Alaska Native	‡	(†)	‡	(†)	‡	(†)
Two or more races	93.0	(2.38)	95.4	(1.8)	99.1	(0.87)
English language learner (ELL) status						
ELL	90.8	(1.34)	97.0	(0.9)	96.3	(1.48)
Non-ELL	95.6	(0.34)	98.4	(0.2)	98.1	(0.20)
Disability status[1]						
Identified as student with disability (SD)	91.8	(1.28)	95.9	(0.8)	97.4	(0.81)
Not identified as SD	95.4	(0.34)	98.6	(0.2)	98.1	(0.21)
Eligibility for free or reduced-price lunch						
Eligible	93.0	(0.51)	97.7	(0.3)	97.4	(0.35)
Not eligible	97.8	(0.36)	99.1	(0.2)	98.5	(0.23)
Information not available	‡	(†)	98.1	(1.3)	‡	(†)
School locale						
City	93.9	(0.66)	97.8	(0.4)	97.9	(0.33)
Suburb	95.8	(0.48)	98.4	(0.3)	98.2	(0.32)
Town	94.3	(1.11)	98.1	(0.6)	97.6	(0.96)
Rural	95.6	(0.75)	98.9	(0.3)	98.1	(0.47)

†Not applicable.
‡Reporting standards not met (too few cases for a reliable estimate).
[1]The student with disability (SD) variable used in this table includes students who have a 504 plan, even if they do not have an Individualized Education Plan (IEP).

NOTE: Digital devices include desktop computers, laptop computers, tablets, and smartphones. Race categories exclude persons of Hispanic ethnicity.
SOURCE: American Institutes for Research, National Assessment of Educational Progress (NAEP) Validity Studies Panel, *Initial Tables From the 2015 Computer Access and Familiarity Study.* (This table was prepared January 2017.)

Table 14.1. Percentage distribution of 4th-, 8th-, and 12th-grade public school students, by when student first used a laptop or desktop computer and selected student and school characteristics: 2015

[Standard errors appear in parentheses]

Selected student or school characteristic	4th-graders, by first use of computer				8th-graders, by first use of computer					12th-graders, by first use of computer					
	In kindergarten or before	In 1st, 2nd, or 3rd grade	In 4th grade	Never used	In kindergarten or before	In 1st, 2nd, or 3rd grade	In 4th or 5th grade	In 6th, 7th, or 8th grade	Never used	In kindergarten or before	In 1st, 2nd, or 3rd grade	In 4th or 5th grade	In 6th, 7th, or 8th grade	In high school	Never used
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Total	**41.1 (0.77)**	**44.0 (0.77)**	**10.6 (0.48)**	**4.3 (0.31)**	**34.8 (0.66)**	**41.7 (0.68)**	**15.8 (0.51)**	**7.0 (0.35)**	**0.7 (0.11)**	**28.9 (0.66)**	**35.1 (0.70)**	**17.0 (0.55)**	**15.0 (0.52)**	**3.5 (0.27)**	**0.5 (0.10)**
Sex															
Male	39.4 (1.07)	44.8 (1.09)	10.7 (0.68)	5.0 (0.48)	32.6 (0.90)	42.6 (0.95)	16.7 (0.72)	7.2 (0.50)	1.0 (0.19)	29.3 (0.94)	35.2 (0.98)	17.0 (0.77)	14.1 (0.72)	3.8 (0.39)	0.7 (0.17)
Female	42.8 (1.09)	43.1 (1.09)	10.5 (0.68)	3.5 (0.41)	37.2 (0.97)	40.7 (0.98)	15.0 (0.71)	6.8 (0.50)	0.3 ! (0.11)	28.6 (0.94)	35.0 (0.99)	16.9 (0.78)	16.0 (0.76)	3.2 (0.37)	0.3 ! (0.11)
Race/ethnicity															
White	46.0 (1.17)	43.7 (1.16)	7.8 (0.63)	2.5 (0.37)	40.0 (1.01)	40.7 (1.01)	13.1 (0.70)	5.7 (0.48)	0.5 ! (0.14)	33.6 (1.02)	34.3 (1.03)	16.2 (0.80)	12.7 (0.72)	2.8 (0.36)	0.4 ! (0.14)
Black	40.4 (1.67)	39.1 (1.66)	14.1 (1.18)	6.5 (0.83)	34.8 (1.57)	41.0 (1.62)	14.2 (1.15)	8.8 (0.93)	1.3 (0.37)	28.6 (1.44)	35.9 (1.53)	15.7 (1.16)	15.7 (1.16)	3.4 (0.58)	0.7 ! (0.27)
Hispanic	33.2 (1.41)	46.7 (1.49)	13.8 (1.03)	6.3 (0.73)	27.3 (1.15)	43.2 (1.28)	20.7 (1.05)	8.3 (0.71)	0.5 ! (0.19)	20.4 (1.22)	36.0 (1.46)	20.5 (1.22)	18.0 (1.17)	4.4 (0.62)	0.6 ! (0.24)
Asian	41.3 (3.53)	50.5 (3.58)	6.6 (1.78)	‡ (†)	31.1 (2.82)	45.6 (3.04)	18.1 (2.35)	5.2 (1.35)	# (†)	26.9 (2.82)	35.7 (3.04)	12.4 (2.10)	19.3 (2.50)	5.2 (1.41)	‡ (†)
Pacific Islander	‡ (†)	‡ (†)	‡ (†)	‡ (†)	‡ (†)	‡ (†)	‡ (†)	‡ (†)	‡ (†)	21.6 (3.93)	34.2 (4.52)	18.9 (3.73)	18.0 (3.66)	7.2 ! (2.47)	# (†)
American Indian/Alaska Native	‡ (†)	‡ (†)	‡ (†)	‡ (†)	‡ (†)	‡ (†)	‡ (†)	‡ (†)	‡ (†)	‡ (†)	‡ (†)	‡ (†)	‡ (†)	‡ (†)	‡ (†)
Two or more races	43.4 (4.68)	49.6 (4.72)	5.3 ! (2.12)	‡ (†)	35.9 (4.26)	41.4 (4.37)	14.8 (3.15)	6.3 ! (2.15)	‡ (†)	37.2 (4.57)	33.6 (4.46)	16.8 (3.53)	11.5 (3.01)	‡ (†)	# (†)
English language learner (ELL) status															
ELL	31.0 (2.17)	41.3 (2.31)	17.4 (1.78)	10.3 (1.43)	18.0 (2.04)	41.0 (2.61)	27.8 (2.38)	11.8 (1.71)	1.4 ! (0.62)	12.3 (2.58)	23.9 (3.35)	21.5 (3.23)	29.4 (3.58)	9.8 (2.34)	3.1 ! (1.35)
Non-ELL	42.4 (0.81)	44.3 (0.82)	9.8 (0.49)	3.5 (0.30)	36.1 (0.69)	41.7 (0.71)	15.0 (0.51)	6.6 (0.36)	0.6 (0.11)	29.5 (0.68)	35.5 (0.71)	16.8 (0.56)	14.5 (0.52)	3.3 (0.26)	0.4 (0.10)
Disability status[1]															
Identified as student with disability (SD)	35.6 (2.27)	38.5 (2.30)	18.3 (1.83)	7.6 (1.26)	29.1 (1.97)	36.2 (2.09)	19.2 (1.71)	13.0 (1.46)	2.5 (0.67)	26.1 (2.25)	27.6 (2.30)	20.3 (2.06)	18.7 (2.00)	6.8 (1.30)	‡ (†)
Not identified as SD	41.8 (0.81)	44.7 (0.82)	9.7 (0.49)	3.9 (0.32)	35.5 (0.70)	42.3 (0.72)	15.5 (0.53)	6.3 (0.36)	0.4 (0.10)	29.2 (0.69)	35.7 (0.73)	16.7 (0.57)	14.7 (0.54)	3.2 (0.27)	0.5 (0.11)
Eligibility for free or reduced-price lunch															
Eligible	36.5 (0.98)	44.6 (1.01)	13.1 (0.69)	5.7 (0.47)	30.5 (0.85)	42.2 (0.91)	17.7 (0.71)	8.5 (0.52)	1.0 (0.18)	22.2 (0.92)	36.3 (1.06)	18.4 (0.86)	18.1 (0.85)	4.1 (0.44)	0.8 (0.20)
Not eligible	47.7 (1.21)	43.2 (1.20)	7.0 (0.62)	2.2 (0.36)	40.8 (1.05)	40.5 (1.05)	13.4 (0.73)	5.1 (0.47)	0.2 ! (0.10)	34.2 (0.93)	34.1 (0.93)	15.8 (0.72)	12.7 (0.65)	3.0 (0.33)	0.3 ! (0.10)
Information not available	‡ (†)	‡ (†)	‡ (†)	‡ (†)	31.4 (4.55)	50.5 (4.90)	14.3 (3.43)	3.8 ! (1.88)	# (†)	‡ (†)	‡ (†)	‡ (†)	‡ (†)	‡ (†)	‡ (†)
School locale															
City	36.9 (1.34)	44.7 (1.38)	13.2 (0.94)	5.3 (0.62)	32.1 (1.25)	42.9 (1.33)	17.1 (1.01)	7.2 (0.69)	0.7 ! (0.23)	28.4 (1.06)	34.6 (1.12)	17.2 (0.89)	15.5 (0.85)	3.7 (0.45)	0.6 ! (0.18)
Suburb	45.6 (1.22)	41.9 (1.21)	8.8 (0.69)	3.7 (0.46)	36.8 (1.02)	41.1 (1.04)	14.3 (0.74)	7.0 (0.54)	0.8 (0.19)	28.1 (1.07)	35.9 (1.14)	17.1 (0.90)	15.6 (0.86)	3.1 (0.41)	0.3 ! (0.14)
Town	35.3 (2.31)	48.8 (2.41)	12.1 (1.57)	3.7 (0.91)	35.3 (2.10)	39.3 (2.15)	19.1 (1.73)	6.2 (1.06)	‡ (†)	32.1 (2.95)	30.6 (2.91)	14.3 (2.21)	17.9 (2.42)	5.2 (1.40)	# (†)
Rural	41.8 (1.81)	44.7 (1.83)	9.3 (1.07)	4.2 (0.74)	33.9 (1.47)	42.6 (1.54)	16.1 (1.14)	7.0 (0.79)	0.5 ! (0.22)	31.0 (1.58)	35.7 (1.64)	16.9 (1.28)	12.1 (1.11)	3.5 (0.63)	0.8 ! (0.31)

†Not applicable.
#Rounds to zero.
!Interpret data with caution. The coefficient of variation (CV) for this estimate is between 30 and 50 percent.
‡Reporting standards not met. Either there are too few cases for a reliable estimate or the coefficient of variation (CV) is 50 percent or greater.

[1]The student with disability (SD) variable used in this table includes students who have a 504 plan, even if they do not have an Individualized Education Plan (IEP).
NOTE: Race categories exclude persons of Hispanic ethnicity. Detail may not sum to totals because of rounding.
SOURCE: American Institutes for Research, National Assessment of Educational Progress (NAEP) Validity Studies Panel, *Initial Tables From the 2015 Computer Access and Familiarity Study.* (This table was prepared January 2017.)

Table 16.1. Average National Assessment of Educational Progress (NAEP) mathematics scale score and percentage distribution of 4th- and 8th-graders, by computer use and internet access at home and other selected characteristics: 2015

[Standard errors appear in parentheses]

Selected characteristic	Percent of all students		Average mathematics scale score[1]								Percentage distribution of students							
			All students		Student uses a computer at home				Student has access to Internet at home[2]				Student uses a computer at home				Student has access to Internet at home[2]			
					Yes		No		Yes		No		Yes		No		Yes		No	
1	2		3		4		5		6		7		8		9		10		11	
Grade 4																				
All 4th-graders	**100**	**(†)**	**240**	**(0.3)**	**243**	**(0.3)**	**230**	**(0.4)**	**244**	**(0.3)**	**222**	**(0.5)**	**83**	**(0.2)**	**17**	**(0.2)**	**82**	**(0.2)**	**18**	**(0.2)**
Sex																				
Male	51	(0.2)	241	(0.3)	244	(0.3)	231	(0.5)	245	(0.3)	223	(0.6)	82	(0.3)	18	(0.3)	82	(0.3)	18	(0.3)
Female	49	(0.2)	239	(0.3)	242	(0.3)	229	(0.5)	243	(0.3)	221	(0.5)	84	(0.3)	16	(0.3)	82	(0.3)	18	(0.3)
Race/ethnicity																				
White	51	(0.3)	248	(0.3)	250	(0.3)	239	(0.5)	251	(0.3)	232	(0.4)	87	(0.2)	13	(0.2)	86	(0.3)	14	(0.3)
Black	15	(0.3)	224	(0.4)	226	(0.4)	218	(0.7)	228	(0.4)	210	(0.7)	80	(0.4)	20	(0.4)	78	(0.5)	22	(0.5)
Hispanic	25	(0.3)	230	(0.5)	232	(0.5)	225	(0.8)	235	(0.5)	218	(0.8)	77	(0.5)	23	(0.5)	74	(0.5)	26	(0.5)
Asian	5	(0.2)	259	(1.2)	260	(1.2)	248	(2.3)	262	(1.1)	228	(2.7)	93	(0.7)	7	(0.7)	91	(0.7)	9	(0.7)
Pacific Islander	#	(†)	231	(2.3)	235	(2.5)	218	(3.6)	237	(2.7)	213	(3.4)	81	(3.1)	19	(3.1)	74	(2.4)	26	(2.4)
American Indian/Alaska Native	1	(#)	227	(1.0)	230	(1.0)	222	(1.8)	233	(1.0)	217	(1.6)	69	(1.4)	31	(1.4)	65	(1.2)	35	(1.2)
Two or more races	3	(0.1)	245	(0.8)	247	(0.9)	234	(1.4)	248	(0.9)	228	(1.9)	84	(0.9)	16	(0.9)	84	(1.0)	16	(1.0)
English language learner (ELL) status																				
ELL	11	(0.3)	218	(0.7)	220	(0.8)	214	(1.0)	224	(0.7)	209	(1.1)	74	(0.8)	26	(0.8)	66	(0.8)	34	(0.8)
Non-ELL	89	(0.3)	243	(0.3)	245	(0.3)	233	(0.4)	246	(0.3)	226	(0.4)	84	(0.2)	16	(0.2)	84	(0.3)	16	(0.3)
Disability status[3]																				
Identified as student with disability (SD)	13	(0.1)	218	(0.5)	220	(0.5)	210	(0.9)	223	(0.5)	203	(0.9)	79	(0.5)	21	(0.5)	74	(0.6)	26	(0.6)
Not identified as SD	87	(0.1)	244	(0.3)	246	(0.3)	234	(0.4)	247	(0.3)	227	(0.4)	84	(0.2)	16	(0.2)	83	(0.3)	17	(0.3)
Percent of students in school eligible for free or reduced-price lunch																				
0–25 percent eligible	19	(0.8)	257	(0.7)	258	(0.7)	247	(1.4)	258	(0.6)	239	(1.4)	93	(0.3)	7	(0.3)	91	(0.4)	9	(0.4)
26–50 percent eligible	25	(1.0)	245	(0.5)	247	(0.5)	237	(1.1)	248	(0.5)	229	(0.8)	87	(0.3)	13	(0.3)	85	(0.5)	15	(0.5)
51–75 percent eligible	26	(1.0)	237	(0.5)	239	(0.5)	230	(0.8)	240	(0.5)	224	(1.0)	80	(0.5)	20	(0.5)	79	(0.7)	21	(0.7)
76–100 percent eligible	30	(0.8)	226	(0.5)	228	(0.5)	223	(0.6)	230	(0.4)	215	(0.7)	74	(0.4)	26	(0.4)	73	(0.5)	27	(0.5)
School control[4]																				
Public	92	(0.2)	240	(0.3)	242	(0.3)	230	(0.4)	244	(0.3)	222	(0.4)	82	(0.2)	18	(0.2)	81	(0.2)	19	(0.2)
Private	‡	(†)	‡	(†)	‡	(†)	‡	(†)	‡	(†)	‡	(†)	‡	(†)	‡	(†)	‡	(†)	‡	(†)
School locale																				
City	31	(0.4)	237	(0.5)	240	(0.5)	227	(0.6)	242	(0.5)	218	(0.6)	82	(0.4)	18	(0.4)	80	(0.4)	20	(0.4)
Large	17	(0.3)	235	(0.6)	237	(0.7)	225	(0.8)	240	(0.7)	216	(0.7)	81	(0.5)	19	(0.5)	79	(0.5)	21	(0.5)
Midsize	7	(0.4)	238	(1.3)	240	(1.4)	230	(1.6)	243	(1.3)	219	(1.6)	82	(1.3)	18	(1.3)	81	(1.1)	19	(1.1)
Small	7	(0.5)	241	(1.5)	244	(1.5)	230	(1.6)	246	(1.5)	221	(1.7)	83	(0.8)	17	(0.8)	82	(1.0)	18	(1.0)
Suburb	41	(0.4)	243	(0.5)	246	(0.5)	231	(0.8)	247	(0.5)	223	(0.8)	86	(0.4)	14	(0.4)	85	(0.5)	15	(0.5)
Large	34	(0.6)	244	(0.6)	246	(0.6)	231	(0.9)	248	(0.6)	224	(0.8)	87	(0.4)	13	(0.4)	85	(0.5)	15	(0.5)
Midsize	4	(0.4)	242	(1.3)	244	(1.4)	232	(1.6)	246	(1.1)	222	(2.2)	85	(1.2)	15	(1.2)	83	(1.4)	17	(1.4)
Small	2	(0.3)	234	(2.8)	236	(2.8)	226	(3.4)	238	(2.4)	218	(3.7)	81	(1.8)	19	(1.8)	79	(2.4)	21	(2.4)
Town	11	(0.4)	238	(0.8)	240	(0.8)	231	(1.2)	241	(0.6)	224	(1.5)	80	(0.5)	20	(0.5)	79	(1.0)	21	(1.0)
Fringe	3	(0.3)	237	(2.5)	239	(2.2)	228	(4.4)	242	(1.4)	219	(5.4)	83	(1.5)	17	(1.5)	80	(2.7)	20	(2.7)
Distant	5	(0.3)	238	(0.9)	240	(1.0)	232	(1.2)	241	(0.9)	226	(1.5)	79	(0.8)	21	(0.8)	79	(0.8)	21	(0.8)
Remote	3	(0.2)	238	(1.1)	240	(1.3)	232	(1.3)	242	(1.4)	225	(1.3)	78	(1.0)	22	(1.0)	78	(1.8)	22	(1.8)
Rural	17	(0.3)	241	(0.6)	243	(0.6)	234	(0.8)	244	(0.6)	228	(0.8)	81	(0.6)	19	(0.6)	81	(0.4)	19	(0.4)
Fringe	9	(0.3)	243	(1.0)	245	(0.9)	234	(1.3)	246	(1.0)	228	(1.3)	83	(0.8)	17	(0.8)	84	(0.6)	16	(0.6)
Distant	6	(0.3)	239	(0.6)	241	(0.7)	234	(1.1)	242	(0.7)	228	(1.2)	78	(1.0)	22	(1.0)	79	(0.8)	21	(0.8)
Remote	2	(0.1)	237	(0.8)	239	(0.9)	232	(1.3)	241	(0.9)	226	(1.3)	76	(1.1)	24	(1.1)	72	(1.5)	28	(1.5)

See notes at end of table.

Table 16.1. Average National Assessment of Educational Progress (NAEP) mathematics scale score and percentage distribution of 4th- and 8th-graders, by computer use and internet access at home and other selected characteristics: 2015—Continued

[Standard errors appear in parentheses]

Selected characteristic	Percent of all students		Average mathematics scale score[1]								Percentage distribution of students							
			All students		Student uses a computer at home				Student has access to Internet at home[2]				Student uses a computer at home				Student has access to Internet at home[2]			
					Yes		No		Yes		No		Yes		No		Yes		No	
1	2		3		4		5		6		7		8		9		10		11	
Grade 8																				
All 8th-graders	**100**	**(†)**	**282**	**(0.3)**	**285**	**(0.3)**	**262**	**(0.5)**	**284**	**(0.3)**	**261**	**(0.6)**	**88**	**(0.2)**	**12**	**(0.2)**	**92**	**(0.1)**	**8**	**(0.1)**
Sex																				
Male	51	(0.1)	282	(0.3)	285	(0.4)	263	(0.6)	284	(0.4)	260	(0.9)	88	(0.3)	12	(0.3)	92	(0.2)	8	(0.2)
Female	49	(0.1)	282	(0.4)	285	(0.4)	262	(0.7)	284	(0.4)	262	(0.8)	88	(0.2)	12	(0.2)	92	(0.2)	8	(0.2)
Race/ethnicity																				
White	52	(0.4)	292	(0.3)	294	(0.3)	272	(0.7)	293	(0.3)	275	(0.7)	92	(0.2)	8	(0.2)	93	(0.1)	7	(0.1)
Black	15	(0.3)	260	(0.5)	262	(0.6)	252	(0.8)	262	(0.5)	242	(1.3)	83	(0.4)	17	(0.4)	91	(0.3)	9	(0.3)
Hispanic	24	(0.4)	270	(0.5)	273	(0.6)	259	(0.8)	272	(0.6)	251	(1.1)	82	(0.5)	18	(0.5)	89	(0.4)	11	(0.4)
Asian	5	(0.2)	307	(1.5)	309	(1.5)	277	(4.3)	309	(1.5)	264	(5.0)	96	(0.5)	4	(0.5)	97	(0.4)	3	(0.4)
Pacific Islander	#	(†)	276	(2.9)	280	(3.2)	256	(5.4)	279	(3.2)	255	(3.9)	87	(2.0)	13	(2.0)	89	(1.3)	11	(1.3)
American Indian/Alaska Native	1	(#)	267	(1.3)	271	(1.6)	258	(2.5)	270	(1.5)	257	(2.5)	75	(1.6)	25	(1.6)	78	(1.5)	22	(1.5)
Two or more races	2	(0.1)	285	(1.1)	288	(1.1)	264	(1.9)	286	(1.1)	271	(2.4)	89	(0.6)	11	(0.6)	93	(0.4)	7	(0.4)
English language learner (ELL) status																				
ELL	6	(0.1)	246	(0.8)	249	(0.9)	239	(1.4)	249	(0.9)	233	(1.7)	77	(0.9)	23	(0.9)	81	(0.7)	19	(0.7)
Non-ELL	94	(0.1)	284	(0.3)	287	(0.3)	265	(0.5)	286	(0.3)	265	(0.6)	89	(0.2)	11	(0.2)	93	(0.1)	7	(0.1)
Disability status[3]																				
Identified as student with disability (SD)	12	(0.1)	247	(0.5)	250	(0.6)	235	(1.0)	250	(0.6)	230	(1.1)	82	(0.5)	18	(0.5)	85	(0.4)	15	(0.4)
Not identified as SD	88	(0.1)	287	(0.3)	289	(0.3)	268	(0.5)	288	(0.3)	269	(0.6)	89	(0.2)	11	(0.2)	93	(0.1)	7	(0.1)
Percent of students in school eligible for free or reduced-price lunch																				
0–25 percent eligible	21	(0.8)	301	(0.6)	302	(0.6)	275	(2.0)	302	(0.6)	283	(1.6)	96	(0.3)	4	(0.3)	95	(0.2)	5	(0.2)
26–50 percent eligible	29	(0.9)	287	(0.5)	289	(0.5)	268	(0.9)	288	(0.5)	269	(1.0)	91	(0.3)	9	(0.3)	92	(0.3)	8	(0.3)
51–75 percent eligible	25	(1.0)	276	(0.7)	279	(0.7)	265	(0.9)	278	(0.7)	261	(1.1)	84	(0.4)	16	(0.4)	91	(0.3)	9	(0.3)
76–100 percent eligible	25	(0.8)	264	(0.7)	266	(0.8)	256	(1.0)	266	(0.7)	248	(1.3)	79	(0.5)	21	(0.5)	88	(0.4)	12	(0.4)
School control[4]																				
Public	92	(0.2)	281	(0.3)	284	(0.3)	262	(0.5)	283	(0.3)	261	(0.6)	87	(0.2)	13	(0.2)	92	(0.2)	8	(0.2)
Private	‡	(†)	‡	(†)	‡	(†)	‡	(†)	‡	(†)	‡	(†)	‡	(†)	‡	(†)	‡	(†)	‡	(†)
School locale																				
City	31	(0.4)	278	(0.7)	282	(0.7)	259	(0.9)	281	(0.7)	252	(1.0)	86	(0.4)	14	(0.4)	92	(0.3)	8	(0.3)
Large	16	(0.4)	276	(1.0)	279	(1.1)	257	(1.2)	278	(1.0)	248	(1.5)	85	(0.6)	15	(0.6)	92	(0.4)	8	(0.4)
Midsize	7	(0.4)	277	(1.7)	281	(1.7)	258	(1.9)	279	(1.7)	253	(2.7)	85	(1.1)	15	(1.1)	92	(0.5)	8	(0.5)
Small	8	(0.4)	286	(1.3)	289	(1.3)	264	(1.8)	287	(1.4)	261	(2.0)	89	(1.0)	11	(1.0)	93	(0.4)	7	(0.4)
Suburb	41	(0.4)	286	(0.5)	288	(0.5)	262	(0.9)	288	(0.5)	263	(1.1)	91	(0.2)	9	(0.2)	93	(0.2)	7	(0.2)
Large	35	(0.5)	287	(0.5)	289	(0.6)	262	(1.1)	288	(0.5)	264	(1.3)	92	(0.2)	8	(0.2)	93	(0.2)	7	(0.2)
Midsize	4	(0.3)	282	(1.6)	284	(1.7)	266	(2.0)	283	(1.6)	260	(2.8)	89	(0.9)	11	(0.9)	94	(0.6)	6	(0.6)
Small	2	(0.3)	283	(3.2)	286	(3.0)	259	(3.7)	284	(3.4)	263	(3.8)	88	(1.7)	12	(1.7)	92	(0.8)	8	(0.8)
Town	11	(0.3)	279	(0.7)	281	(0.8)	266	(1.1)	280	(0.7)	267	(1.6)	84	(0.6)	16	(0.6)	89	(0.4)	11	(0.4)
Fringe	3	(0.3)	282	(2.0)	284	(1.8)	265	(3.8)	283	(1.9)	270	(5.5)	86	(1.0)	14	(1.0)	92	(0.9)	8	(0.9)
Distant	5	(0.4)	278	(1.0)	280	(1.1)	267	(1.7)	279	(1.0)	267	(2.2)	83	(0.9)	17	(0.9)	88	(0.8)	12	(0.8)
Remote	3	(0.2)	278	(1.5)	281	(1.8)	265	(1.9)	280	(1.5)	264	(1.9)	83	(1.2)	17	(1.2)	88	(0.8)	12	(0.8)
Rural	18	(0.4)	282	(0.6)	285	(0.6)	267	(0.7)	284	(0.6)	265	(1.1)	86	(0.4)	14	(0.4)	90	(0.3)	10	(0.3)
Fringe	10	(0.5)	284	(0.9)	286	(0.9)	266	(1.4)	285	(0.9)	265	(2.0)	88	(0.6)	12	(0.6)	92	(0.5)	8	(0.5)
Distant	6	(0.3)	281	(0.7)	283	(0.8)	268	(1.1)	282	(0.7)	267	(1.6)	83	(0.7)	17	(0.7)	89	(0.7)	11	(0.7)
Remote	2	(0.1)	278	(1.1)	281	(1.1)	266	(1.8)	281	(1.1)	263	(2.2)	83	(1.1)	17	(1.1)	85	(0.8)	15	(0.8)

†Not applicable.
#Rounds to zero.
‡Reporting standards not met (too few cases for a reliable estimate).
[1]Scale ranges from 0 to 500.
[2]"Access to the Internet" was one item on a list preceded by the question "Do you have the following in your home?" For each item, students could either select "Yes" or leave the item blank. Students who left "Access to the Internet" blank are counted as having no internet access at home.
[3]The student with disability (SD) variable used in this table includes students who have a 504 plan, even if they do not have an Individualized Education Plan (IEP).
[4]Based on a variable that includes five categories: Public, Other private, Catholic, Bureau of Indian Education, and Department of Defense. Bureau of Indian Education and Department of Defense were omitted from this table, and Other private and Catholic were collapsed to create the Private category.
NOTE: Includes students tested with accommodations (14 percent of all 4th-graders and 12 percent of all 8th-graders); excludes only those students with disabilities and English language learners who were unable to be tested even with accommodations (2 percent of all students at both grades). Includes public and private schools. Race categories exclude persons of Hispanic ethnicity. Detail may not sum to totals because of rounding.
SOURCE: U.S. Department of Education, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2015 Mathematics Assessment, retrieved September 23, 2016, from the Main NAEP Data Explorer (http://nces.ed.gov/nationsreportcard/naepdata/). (This table was prepared October 2016.)

Table 17.1. Average National Assessment of Educational Progress (NAEP) science scale score and percentage distribution of 4th- and 8th-graders, by computer use and internet access at home and other selected characteristics: 2015

[Standard errors appear in parentheses]

Grade and selected characteristic	Percent of all students		Average science scale score[1]								Percentage distribution of students							
			All students		Student uses a computer at home				Student has access to Internet at home[2]				Student uses a computer at home				Student has access to Internet at home[2]			
					Yes		No		Yes		No		Yes		No		Yes		No	
1	2		3		4		5		6		7		8		9		10		11	
Grade 4																				
All 4th-graders	**100**	**(†)**	**154**	**(0.3)**	**156**	**(0.3)**	**141**	**(0.5)**	**158**	**(0.3)**	**133**	**(0.6)**	**83**	**(0.2)**	**17**	**(0.2)**	**82**	**(0.2)**	**18**	**(0.2)**
Sex																				
Male	51	(0.2)	154	(0.4)	157	(0.4)	142	(0.7)	159	(0.4)	133	(0.8)	82	(0.3)	18	(0.3)	82	(0.3)	18	(0.3)
Female	49	(0.2)	154	(0.3)	156	(0.4)	140	(0.7)	158	(0.3)	133	(0.6)	84	(0.3)	16	(0.3)	82	(0.3)	18	(0.3)
Race/ethnicity																				
White	51	(0.3)	166	(0.3)	167	(0.3)	156	(0.6)	168	(0.3)	150	(0.6)	87	(0.2)	13	(0.2)	86	(0.3)	14	(0.3)
Black	14	(0.3)	133	(0.4)	135	(0.5)	126	(0.8)	137	(0.5)	116	(0.9)	80	(0.5)	20	(0.5)	78	(0.5)	22	(0.5)
Hispanic	25	(0.3)	139	(0.7)	142	(0.7)	132	(1.2)	145	(0.7)	122	(1.1)	77	(0.6)	23	(0.6)	76	(0.6)	24	(0.6)
Asian	5	(0.2)	169	(1.4)	171	(1.4)	149	(2.9)	172	(1.3)	132	(2.7)	92	(0.6)	8	(0.6)	91	(0.7)	9	(0.7)
Pacific Islander	#	(†)	143	(2.2)	148	(2.8)	131	(4.9)	151	(2.5)	120	(4.2)	75	(2.8)	25	(2.8)	74	(2.7)	26	(2.7)
American Indian/Alaska Native	1	(#)	139	(1.5)	144	(1.7)	134	(2.6)	146	(1.5)	126	(2.6)	70	(1.8)	30	(1.8)	65	(1.7)	35	(1.7)
Two or more races	3	(0.1)	158	(1.0)	161	(1.1)	148	(1.9)	162	(1.0)	138	(2.2)	83	(0.9)	17	(0.9)	83	(0.8)	17	(0.8)
English language learner (ELL) status																				
ELL	11	(0.3)	121	(1.0)	123	(1.0)	117	(1.8)	127	(1.0)	109	(1.5)	74	(1.0)	26	(1.0)	67	(0.9)	33	(0.9)
Non-ELL	89	(0.3)	158	(0.3)	160	(0.3)	146	(0.5)	161	(0.3)	139	(0.5)	84	(0.2)	16	(0.2)	84	(0.2)	16	(0.2)
Disability status[3]																				
Identified as student with disability (SD)	13	(0.1)	131	(0.6)	135	(0.7)	121	(1.4)	138	(0.6)	113	(1.1)	78	(0.6)	22	(0.6)	73	(0.7)	27	(0.7)
Not identified as SD	87	(0.1)	157	(0.3)	159	(0.3)	145	(0.5)	161	(0.3)	138	(0.7)	84	(0.2)	16	(0.2)	83	(0.3)	17	(0.3)
Percent of students in school eligible for free or reduced-price lunch																				
0–25 percent eligible	19	(0.8)	172	(0.6)	174	(0.6)	162	(2.0)	174	(0.6)	154	(1.7)	93	(0.4)	7	(0.4)	91	(0.5)	9	(0.5)
26–50 percent eligible	24	(0.9)	161	(0.7)	163	(0.7)	152	(1.0)	164	(0.7)	144	(1.1)	87	(0.4)	13	(0.4)	85	(0.4)	15	(0.4)
51–75 percent eligible	26	(1.0)	151	(0.7)	153	(0.7)	144	(1.2)	155	(0.7)	136	(1.6)	80	(0.5)	20	(0.5)	79	(0.6)	21	(0.6)
76–100 percent eligible	30	(0.8)	134	(0.6)	136	(0.6)	130	(0.9)	140	(0.5)	121	(0.8)	74	(0.5)	26	(0.5)	73	(0.6)	27	(0.6)
School control[4]																				
Public	92	(0.2)	153	(0.3)	155	(0.3)	141	(0.5)	157	(0.3)	132	(0.6)	83	(0.2)	17	(0.2)	82	(0.3)	18	(0.3)
Private	‡	(†)	‡	(†)	‡	(†)	‡	(†)	‡	(†)	‡	(†)	‡	(†)	‡	(†)	‡	(†)	‡	(†)
School locale																				
City	31	(0.5)	148	(0.6)	151	(0.6)	135	(0.9)	153	(0.6)	125	(0.9)	82	(0.4)	18	(0.4)	80	(0.4)	20	(0.4)
Large	17	(0.3)	144	(0.8)	147	(0.9)	132	(1.1)	150	(0.9)	122	(1.3)	81	(0.6)	19	(0.6)	79	(0.5)	21	(0.5)
Midsize	7	(0.4)	151	(2.1)	154	(2.2)	136	(2.3)	156	(2.0)	127	(2.5)	83	(1.0)	17	(1.0)	82	(1.0)	18	(1.0)
Small	7	(0.5)	153	(2.2)	156	(2.1)	139	(2.8)	158	(1.9)	130	(3.1)	82	(1.0)	18	(1.0)	82	(1.0)	18	(1.0)
Suburb	41	(0.4)	157	(0.6)	159	(0.6)	143	(1.3)	161	(0.5)	134	(1.3)	87	(0.4)	13	(0.4)	85	(0.5)	15	(0.5)
Large	34	(0.6)	158	(0.7)	160	(0.6)	142	(1.3)	162	(0.6)	135	(1.2)	87	(0.5)	13	(0.5)	85	(0.6)	15	(0.6)
Midsize	4	(0.5)	156	(2.1)	158	(2.3)	147	(2.9)	159	(1.9)	133	(3.3)	84	(1.5)	16	(1.5)	86	(1.3)	14	(1.3)
Small	2	(0.3)	151	(4.5)	154	(4.1)	136	(6.4)	157	(2.9)	127	(8.6)	81	(2.5)	19	(2.5)	79	(3.0)	21	(3.0)
Town	11	(0.4)	153	(0.8)	155	(0.7)	144	(1.9)	157	(0.7)	138	(1.8)	79	(0.8)	21	(0.8)	79	(0.8)	21	(0.8)
Fringe	3	(0.3)	153	(2.4)	157	(1.6)	138	(6.4)	158	(1.7)	133	(6.0)	82	(2.2)	18	(2.2)	82	(1.8)	18	(1.8)
Distant	5	(0.3)	153	(1.2)	155	(1.3)	147	(1.9)	157	(1.2)	142	(1.9)	79	(0.8)	21	(0.8)	78	(1.0)	22	(1.0)
Remote	3	(0.2)	151	(1.1)	154	(1.2)	145	(2.0)	155	(1.1)	137	(1.5)	77	(1.1)	23	(1.1)	79	(1.3)	21	(1.3)
Rural	17	(0.3)	157	(0.7)	160	(0.7)	149	(1.0)	161	(0.7)	142	(1.1)	81	(0.5)	19	(0.5)	80	(0.5)	20	(0.5)
Fringe	9	(0.3)	159	(1.3)	161	(1.2)	147	(1.9)	163	(1.2)	139	(1.9)	83	(0.9)	17	(0.9)	83	(1.0)	17	(1.0)
Distant	6	(0.3)	157	(0.8)	159	(0.7)	152	(1.5)	160	(0.8)	146	(1.4)	79	(0.8)	21	(0.8)	79	(0.8)	21	(0.8)
Remote	2	(0.1)	153	(1.3)	156	(1.3)	145	(2.1)	157	(1.3)	139	(1.9)	76	(1.1)	24	(1.1)	74	(1.2)	26	(1.2)

See notes at end of table.

Table 17.1. Average National Assessment of Educational Progress (NAEP) science scale score and percentage distribution of 4th- and 8th-graders, by computer use and internet access at home and other selected characteristics: 2015—Continued

[Standard errors appear in parentheses]

Grade and selected characteristic	Percent of all students		Average science scale score[1]								Percentage distribution of students							
					Student uses a computer at home				Student has access to Internet at home[2]				Student uses a computer at home				Student has access to Internet at home[2]			
			All students		Yes		No		Yes		No		Yes		No		Yes		No	
1	2		3		4		5		6		7		8		9		10		11	
Grade 8																				
All 8th-graders	**100**	**(†)**	**154**	**(0.3)**	**156**	**(0.3)**	**136**	**(0.5)**	**156**	**(0.3)**	**135**	**(0.8)**	**88**	**(0.2)**	**12**	**(0.2)**	**92**	**(0.1)**	**8**	**(0.1)**
Sex																				
Male	51	(0.2)	155	(0.3)	158	(0.3)	139	(0.8)	157	(0.4)	136	(1.1)	88	(0.3)	12	(0.3)	92	(0.2)	8	(0.2)
Female	49	(0.2)	152	(0.4)	155	(0.4)	134	(0.9)	154	(0.4)	134	(1.0)	89	(0.2)	11	(0.2)	92	(0.2)	8	(0.2)
Race/ethnicity																				
White	52	(0.5)	166	(0.3)	167	(0.3)	151	(0.7)	166	(0.3)	154	(0.9)	92	(0.2)	8	(0.2)	93	(0.2)	7	(0.2)
Black	15	(0.3)	132	(0.5)	134	(0.5)	122	(1.0)	133	(0.5)	112	(1.5)	84	(0.5)	16	(0.5)	91	(0.4)	9	(0.4)
Hispanic	24	(0.4)	140	(0.5)	142	(0.5)	130	(1.2)	142	(0.5)	121	(1.5)	82	(0.4)	18	(0.4)	90	(0.4)	10	(0.4)
Asian	5	(0.2)	166	(0.9)	167	(0.9)	142	(3.9)	168	(0.9)	128	(5.1)	96	(0.5)	4	(0.5)	97	(0.4)	3	(0.4)
Pacific Islander	#	(†)	138	(2.5)	144	(3.1)	112	(6.1)	141	(2.9)	119	(4.6)	80	(2.9)	20	(2.9)	84	(2.4)	16	(2.4)
American Indian/Alaska Native	1	(0.1)	139	(1.6)	143	(2.1)	133	(2.2)	143	(2.0)	128	(3.1)	73	(1.4)	27	(1.4)	77	(1.6)	23	(1.6)
Two or more races	3	(0.1)	159	(1.3)	162	(1.5)	141	(2.6)	161	(1.4)	143	(3.3)	89	(0.9)	11	(0.9)	92	(0.7)	8	(0.7)
English language learner (ELL) status																				
ELL	6	(0.1)	110	(1.1)	113	(1.3)	102	(2.2)	114	(1.2)	95	(2.4)	78	(0.9)	22	(0.9)	81	(1.0)	19	(1.0)
Non-ELL	94	(0.1)	157	(0.3)	159	(0.3)	141	(0.5)	158	(0.3)	141	(0.7)	89	(0.2)	11	(0.2)	93	(0.1)	7	(0.1)
Disability status[3]																				
Identified as student with disability (SD)	12	(0.1)	124	(0.6)	127	(0.7)	114	(1.4)	127	(0.6)	106	(1.4)	82	(0.5)	18	(0.5)	85	(0.6)	15	(0.6)
Not identified as SD	88	(0.1)	158	(0.3)	160	(0.3)	141	(0.6)	159	(0.3)	143	(0.9)	89	(0.2)	11	(0.2)	93	(0.1)	7	(0.1)
Percent of students in school eligible for free or reduced-price lunch																				
0–25 percent eligible	21	(0.8)	170	(0.6)	171	(0.6)	149	(2.0)	171	(0.6)	155	(2.4)	96	(0.3)	4	(0.3)	95	(0.3)	5	(0.3)
26–50 percent eligible	29	(0.9)	161	(0.5)	162	(0.5)	145	(1.5)	162	(0.4)	147	(1.8)	91	(0.3)	9	(0.3)	92	(0.4)	8	(0.4)
51–75 percent eligible	25	(1.0)	150	(0.6)	152	(0.6)	140	(1.0)	151	(0.6)	135	(1.2)	85	(0.5)	15	(0.5)	91	(0.3)	9	(0.3)
76–100 percent eligible	25	(0.8)	134	(0.8)	136	(0.8)	128	(1.2)	136	(0.7)	120	(1.8)	80	(0.6)	20	(0.6)	89	(0.4)	11	(0.4)
School control[4]																				
Public	92	(0.2)	153	(0.3)	155	(0.3)	136	(0.5)	155	(0.3)	135	(0.8)	88	(0.2)	12	(0.2)	92	(0.2)	8	(0.2)
Private	‡	(†)	‡	(†)	‡	(†)	‡	(†)	‡	(†)	‡	(†)	‡	(†)	‡	(†)	‡	(†)	‡	(†)
School locale																				
City	30	(0.4)	148	(0.6)	151	(0.6)	129	(1.2)	150	(0.6)	124	(1.4)	87	(0.3)	13	(0.3)	92	(0.2)	8	(0.2)
Large	16	(0.4)	144	(0.9)	147	(0.9)	126	(1.7)	146	(0.9)	118	(1.8)	86	(0.5)	14	(0.5)	92	(0.4)	8	(0.4)
Midsize	7	(0.4)	149	(1.6)	152	(1.6)	129	(2.7)	151	(1.6)	124	(4.0)	87	(0.8)	13	(0.8)	92	(0.7)	8	(0.7)
Small	8	(0.4)	156	(1.3)	158	(1.2)	136	(2.6)	157	(1.2)	138	(2.9)	89	(0.8)	11	(0.8)	93	(0.4)	7	(0.4)
Suburb	41	(0.4)	158	(0.4)	160	(0.4)	137	(0.9)	159	(0.5)	138	(1.3)	91	(0.2)	9	(0.2)	94	(0.2)	6	(0.2)
Large	35	(0.5)	158	(0.5)	160	(0.5)	136	(1.1)	159	(0.5)	139	(1.4)	91	(0.3)	9	(0.3)	93	(0.3)	7	(0.3)
Midsize	4	(0.4)	154	(1.9)	157	(1.9)	138	(3.3)	156	(2.0)	131	(3.6)	88	(1.0)	12	(1.0)	94	(0.6)	6	(0.6)
Small	2	(0.3)	159	(3.4)	161	(3.7)	141	(3.4)	160	(3.4)	143	(6.1)	90	(1.4)	10	(1.4)	94	(0.8)	6	(0.8)
Town	11	(0.3)	154	(0.7)	156	(0.7)	141	(1.4)	155	(0.6)	141	(1.8)	85	(0.6)	15	(0.6)	91	(0.4)	9	(0.4)
Fringe	3	(0.3)	157	(1.7)	158	(1.6)	143	(3.8)	158	(1.7)	140	(3.4)	88	(1.0)	12	(1.0)	93	(0.5)	7	(0.5)
Distant	5	(0.4)	152	(1.2)	154	(1.3)	140	(1.7)	153	(1.2)	143	(2.4)	84	(1.0)	16	(1.0)	89	(0.7)	11	(0.7)
Remote	3	(0.2)	154	(1.4)	156	(1.2)	142	(4.2)	155	(1.3)	139	(2.8)	85	(1.2)	15	(1.2)	90	(0.6)	10	(0.6)
Rural	18	(0.4)	156	(0.6)	158	(0.6)	145	(1.1)	158	(0.5)	141	(1.6)	87	(0.4)	13	(0.4)	90	(0.5)	10	(0.5)
Fringe	10	(0.5)	157	(1.0)	159	(0.9)	142	(1.9)	159	(0.8)	139	(2.8)	89	(0.6)	11	(0.6)	91	(0.9)	9	(0.9)
Distant	6	(0.3)	156	(0.9)	158	(1.0)	150	(1.5)	158	(0.9)	144	(1.9)	84	(0.7)	16	(0.7)	89	(0.7)	11	(0.7)
Remote	2	(0.1)	154	(1.0)	157	(0.9)	146	(2.6)	157	(1.0)	141	(2.4)	82	(1.0)	18	(1.0)	84	(1.3)	16	(1.3)

†Not applicable.
#Rounds to zero.
‡Reporting standards not met (too few cases for a reliable estimate).
[1]Scale ranges from 0 to 300.
[2]"Access to the Internet" was one item on a list preceded by the question "Do you have the following in your home?" For each item, students could either select "Yes" or leave the item blank. Students who left "Access to the Internet" blank are counted as having no internet access at home.
[3]The student with disability (SD) variable used in this table includes students who have a 504 plan, even if they do not have an Individualized Education Plan (IEP).
[4]Based on a variable that includes five categories: Public, Other private, Catholic, Bureau of Indian Education, and Department of Defense. Bureau of Indian Education and Department of Defense were omitted from this table, and Other private and Catholic were collapsed to create the Private category.
NOTE: Includes students tested with accommodations (14 percent of all 4th-graders and 10 percent of all 8th-graders); excludes only those students with disabilities and English language learners who were unable to be tested even with accommodations (1 percent of all students at both grades). Race categories exclude persons of Hispanic ethnicity. Detail may not sum to totals because of rounding.
SOURCE: U.S. Department of Education, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2015 Science Assessment, retrieved November 7, 2016, from the Main NAEP Data Explorer (http://nces.ed.gov/nationsreportcard/naepdata/). (This table was prepared November 2016.)

Table 18.1. Average scale score of 8th-graders on the information and communication technology (ICT) content area of the National Assessment of Educational Progress (NAEP) technology and engineering literacy (TEL) assessment and percentage distribution of 8th-graders, by computer use and internet access at home and other selected characteristics: 2014

[Standard errors appear in parentheses]

Selected characteristic	Percent of all students		Average ICT scale score[1]								Percentage distribution of students							
			All students		Student uses a computer at home				Student has access to Internet at home[2]				Student uses a computer at home				Student has access to Internet at home[2]			
					Yes		No		Yes		No		Yes		No		Yes		No	
1	2		3		4		5		6		7		8		9		10		11	
Total	**100**	**(†)**	**150**	**(0.6)**	**152**	**(0.7)**	**128**	**(1.2)**	**152**	**(0.6)**	**124**	**(1.7)**	**91**	**(0.3)**	**9**	**(0.3)**	**94**	**(0.2)**	**6**	**(0.2)**
Sex																				
Male	51	(0.3)	147	(0.7)	150	(0.8)	124	(1.6)	149	(0.7)	121	(2.1)	91	(0.3)	9	(0.3)	94	(0.2)	6	(0.2)
Female	49	(0.3)	153	(0.7)	155	(0.7)	131	(1.5)	155	(0.6)	127	(2.4)	91	(0.3)	9	(0.3)	93	(0.3)	7	(0.3)
Race/ethnicity																				
White	54	(1.4)	159	(0.8)	161	(0.9)	138	(2.3)	160	(0.8)	136	(2.4)	94	(0.3)	6	(0.3)	95	(0.4)	5	(0.4)
Black	16	(0.8)	130	(1.2)	133	(1.2)	117	(1.8)	132	(1.1)	110	(3.1)	87	(0.6)	13	(0.6)	92	(0.4)	8	(0.4)
Hispanic	22	(1.2)	138	(1.0)	141	(1.0)	124	(1.5)	140	(1.0)	120	(2.2)	85	(0.7)	15	(0.7)	90	(0.5)	10	(0.5)
Asian	5	(0.4)	163	(1.9)	165	(1.7)	‡	(†)	166	(1.7)	‡	(†)	97	(0.6)	3	(0.6)	96	(0.7)	4	(0.7)
Pacific Islander	#	(†)	137	(4.5)	140	(5.5)	‡	(†)	139	(5.2)	‡	(†)	84	(4.9)	16	(4.9)	94	(2.6)	6	(2.6)
American Indian/Alaska Native	1	(0.1)	147	(4.3)	150	(4.7)	‡	(†)	151	(4.4)	‡	(†)	85	(3.7)	15	(3.7)	88	(4.7)	12	(4.7)
Two or more races	2	(0.2)	152	(2.8)	155	(2.7)	‡	(†)	154	(2.8)	‡	(†)	90	(2.0)	10	(2.0)	94	(1.2)	6	(1.2)
English language learner (ELL) status																				
ELL	5	(0.3)	107	(1.7)	109	(1.9)	99	(2.7)	110	(1.7)	95	(3.4)	80	(1.2)	20	(1.2)	82	(1.1)	18	(1.1)
Non-ELL	95	(0.3)	152	(0.6)	154	(0.7)	131	(1.2)	154	(0.6)	129	(1.7)	91	(0.2)	9	(0.2)	94	(0.2)	6	(0.2)
Disability status[3]																				
Identified as student with disability (SD)	12	(0.3)	115	(1.3)	118	(1.4)	98	(2.0)	118	(1.2)	95	(2.6)	86	(0.7)	14	(0.7)	86	(0.9)	14	(0.9)
Not identified as SD	88	(0.3)	155	(0.6)	157	(0.6)	134	(1.3)	156	(0.6)	134	(1.6)	92	(0.3)	8	(0.3)	95	(0.2)	5	(0.2)
Percent of students in school eligible for free or reduced-price lunch																				
0 to 25 percent eligible	20	(1.5)	167	(1.2)	168	(1.2)	141	(4.7)	168	(1.2)	‡	(†)	97	(0.4)	3	(0.4)	98	(0.3)	2	(0.3)
26 to 50 percent eligible	32	(2.3)	155	(1.1)	157	(1.2)	138	(2.3)	156	(1.1)	134	(3.6)	93	(0.5)	7	(0.5)	94	(0.4)	6	(0.4)
51 to 75 percent eligible	26	(2.0)	142	(1.0)	145	(1.1)	125	(1.9)	144	(1.0)	123	(2.3)	89	(0.6)	11	(0.6)	92	(0.4)	8	(0.4)
76 to 100 percent eligible	21	(1.6)	132	(1.2)	135	(1.3)	123	(1.6)	135	(1.1)	117	(2.9)	82	(0.8)	18	(0.8)	88	(0.7)	12	(0.7)
School control																				
Public	92	(0.5)	149	(0.6)	151	(0.7)	127	(1.2)	151	(0.6)	124	(1.7)	90	(0.3)	10	(0.3)	93	(0.2)	7	(0.2)
Private	8	(0.5)	163	(1.4)	164	(1.4)	‡	(†)	164	(1.4)	‡	(†)	98	(0.4)	2	(0.4)	99	(0.4)	1	(0.4)
School locale																				
City	29	(1.2)	145	(1.0)	148	(1.1)	124	(1.3)	147	(1.0)	120	(2.3)	89	(0.6)	11	(0.6)	92	(0.4)	8	(0.4)
Large	14	(1.3)	142	(1.2)	145	(1.2)	123	(1.7)	144	(1.2)	118	(2.4)	88	(0.8)	12	(0.8)	92	(0.5)	8	(0.5)
Midsize	10	(1.6)	146	(2.2)	149	(2.3)	123	(2.8)	148	(2.1)	122	(5.1)	89	(1.0)	11	(1.0)	91	(1.0)	9	(1.0)
Small	5	(1.0)	149	(3.5)	152	(3.2)	129	(4.9)	151	(3.3)	124	(5.0)	91	(1.3)	9	(1.3)	95	(1.1)	5	(1.1)
Suburb	35	(1.3)	154	(1.0)	156	(1.0)	128	(2.0)	156	(1.0)	122	(2.8)	93	(0.4)	7	(0.4)	95	(0.3)	5	(0.3)
Large	29	(1.4)	155	(1.1)	157	(1.1)	128	(2.3)	156	(1.1)	121	(3.2)	93	(0.5)	7	(0.5)	95	(0.4)	5	(0.4)
Midsize	3	(1.2)	158	(2.6)	159	(2.4)	‡	(†)	158	(2.6)	‡	(†)	97	(0.9)	3	(0.9)	98	(0.4)	2	(0.4)
Small	3	(0.9)	145	(5.2)	147	(5.7)	‡	(†)	147	(4.9)	‡	(†)	91	(2.5)	9	(2.5)	93	(1.7)	7	(1.7)
Town	11	(1.6)	148	(1.8)	151	(1.9)	123	(2.5)	150	(1.6)	124	(4.8)	89	(0.7)	11	(0.7)	92	(0.5)	8	(0.5)
Fringe	1	(0.4)	164	(4.6)	164	(4.6)	‡	(†)	164	(4.7)	‡	(†)	96	(1.8)	4	(1.8)	97	(1.3)	3	(1.3)
Distant	5	(1.5)	145	(1.7)	148	(1.9)	123	(3.4)	147	(1.7)	121	(3.6)	89	(1.2)	11	(1.2)	92	(0.9)	8	(0.9)
Remote	4	(1.5)	148	(4.6)	151	(4.8)	‡	(†)	150	(3.8)	‡	(†)	89	(1.6)	11	(1.6)	91	(1.5)	9	(1.5)
Rural	25	(1.4)	151	(1.4)	153	(1.4)	134	(2.3)	152	(1.4)	130	(2.6)	91	(0.6)	9	(0.6)	93	(0.6)	7	(0.6)
Fringe	15	(1.0)	152	(1.6)	154	(1.6)	132	(2.7)	153	(1.7)	127	(2.7)	92	(0.7)	8	(0.7)	94	(0.5)	6	(0.5)
Distant	9	(1.1)	149	(2.0)	151	(2.1)	134	(3.1)	151	(1.9)	134	(4.9)	89	(1.0)	11	(1.0)	92	(1.3)	8	(1.3)
Remote	2	(0.7)	‡	(†)	‡	(†)	‡	(†)	‡	(†)	‡	(†)	‡	(†)	‡	(†)	‡	(†)	‡	(†)

†Not applicable.
#Rounds to zero.
‡Reporting standards not met (too few cases for a reliable estimate).
[1]Scale ranges from 0 to 300. Information and communication technology (ICT) is one of three content areas on the TEL assessment. The ICT content area covers software and systems used for accessing, creating, and communicating information, and for facilitating creative expression.
[2]"Access to the Internet" was one item on a list preceded by the question "Do you have the following in your home?" For each item, students could either select "Yes" or leave the item blank. Students who left "Access to the Internet" blank are counted as having no internet access at home.
[3]The student with disability (SD) variable used in this table includes students who have a 504 plan, even if they do not have an Individualized Education Plan (IEP).
NOTE: Includes students tested with accommodations (10 percent of all 8th-graders); excludes only those students with disabilities and English language learners who were unable to be tested even with accommodations (1 percent of all 8th-graders). Race categories exclude persons of Hispanic ethnicity. Detail may not sum to totals because of rounding.
SOURCE: U.S. Department of Education, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2014 Technology and Engineering Literacy (TEL) Assessment, retrieved August 18, 2016, from the Main NAEP Data Explorer (http://nces.ed.gov/nationsreportcard/naepdata/). (This table was prepared August 2016.)

Table 20.1. Average science score and percentage of eighth-graders, by access to the Internet at home, access to a computer or tablet at home or other place outside of school, frequency of computer or tablet use for schoolwork outside of school, and country or other education system: 2015

[Standard errors appear in parentheses]

Country or other education system[1]	Total, all eighth-graders		Access to the Internet at home: Yes, has internet connection at home		Access to the Internet at home: No internet connection at home		Access to a computer or tablet outside of school: Access at home: Yes, has own or shared computer or tablet at home		Access to a computer or tablet outside of school: Access at home: No access to computer or tablet at home		Access to a computer or tablet outside of school: For students with no access at home, access at some other place outside of school: Yes, has access only at some other place[2]		Access to a computer or tablet outside of school: For students with no access at home, access at some other place outside of school: No access outside of school		Frequency of computer or tablet use for schoolwork outside of school: At home: Every day or almost every day		Frequency of computer or tablet use for schoolwork outside of school: At home: Once or twice a week		Frequency of computer or tablet use for schoolwork outside of school: At home: Once or twice a month		Frequency of computer or tablet use for schoolwork outside of school: At home: Never or almost never		Frequency of computer or tablet use for schoolwork outside of school: At some other place than home or school: Every day or almost every day		Frequency of computer or tablet use for schoolwork outside of school: At some other place than home or school: Once or twice a week		Frequency of computer or tablet use for schoolwork outside of school: At some other place than home or school: Once or twice a month		Frequency of computer or tablet use for schoolwork outside of school: At some other place than home or school: Never or almost never	
1	2		3		4		5		6		7		8		9		10		11		12		13		14		15		16	
	Average science score[3]																											
International average[4]	**492**	**(0.6)**	**498**	**(0.6)**	**445**	**(2.1)**	**496**	**(0.6)**	**444**	**(1.7)**	**443**	**(2.6)**	**451**	**(2.3)**	**491**	**(0.7)**	**502**	**(0.7)**	**499**	**(0.9)**	**468**	**(1.1)**	**478**	**(0.8)**	**494**	**(0.8)**	**501**	**(0.8)**	**500**	**(0.7)**
Australia	512	(2.7)	516	(2.5)	452	(6.9)	514	(2.6)	448	(9.1)	438	(11.8)	466	(14.2)	517	(2.9)	518	(3.0)	497	(4.9)	474	(6.7)	500	(4.9)	509	(2.8)	519	(3.8)	523	(3.2)
Bahrain	466	(2.2)	471	(2.2)	398	(11.0)	471	(2.1)	413	(9.0)	405	(11.7)	438	(11.8)	462	(2.6)	483	(3.6)	485	(8.9)	444	(7.9)	451	(3.4)	473	(4.1)	483	(5.6)	486	(3.4)
Canada[5,6,7]	526	(2.2)	528	(2.1)	487	(7.2)	528	(2.0)	497	(8.5)	498	(13.0)	500	(13.7)	529	(2.1)	530	(2.5)	528	(3.7)	512	(5.8)	517	(2.9)	525	(2.9)	533	(2.6)	536	(2.6)
Chile	454	(3.1)	458	(3.1)	437	(5.2)	456	(3.1)	421	(7.2)	418	(9.3)	428	(9.2)	449	(3.8)	470	(3.7)	466	(4.3)	428	(5.0)	431	(4.8)	456	(3.9)	462	(3.8)	464	(3.9)
Chinese Taipei	569	(2.1)	573	(2.1)	541	(5.1)	572	(2.1)	507	(8.9)	517	(14.0)	501	(10.1)	554	(3.3)	587	(2.8)	586	(2.6)	543	(3.7)	525	(5.5)	566	(3.7)	587	(3.3)	571	(2.2)
Egypt	371	(4.3)	394	(4.4)	347	(5.3)	382	(4.0)	338	(6.6)	334	(7.7)	361	(6.3)	370	(4.1)	388	(6.1)	391	(5.9)	369	(6.7)	376	(5.2)	380	(5.2)	382	(6.7)	379	(4.2)
England (United Kingdom)	537	(3.8)	538	(3.8)	490	(13.7)	538	(3.8)	480	(16.6)	‡	(†)	‡	(†)	543	(4.1)	544	(4.7)	504	(6.5)	486	(7.5)	519	(5.1)	530	(4.5)	549	(4.4)	545	(4.4)
Georgia[6,8]	443	(3.1)	451	(3.0)	416	(6.1)	449	(3.2)	410	(5.8)	421	(6.9)	423	(12.7)	439	(4.0)	456	(4.2)	466	(5.8)	436	(7.9)	433	(5.0)	455	(3.5)	451	(4.4)	460	(4.1)
Hong Kong (China)	546	(3.9)	548	(3.8)	504	(9.3)	546	(3.9)	520	(10.6)	517	(15.2)	523	(12.3)	550	(5.1)	549	(4.3)	549	(3.9)	522	(6.0)	522	(7.3)	548	(5.3)	550	(4.9)	549	(3.6)
Hungary	527	(3.4)	530	(3.3)	443	(12.4)	530	(3.2)	429	(13.3)	432	(15.3)	439	(17.9)	519	(3.5)	542	(4.0)	545	(4.5)	506	(9.6)	501	(4.7)	522	(4.1)	528	(4.5)	548	(3.5)
Iran, Islamic Republic of	456	(4.0)	478	(4.9)	430	(3.7)	469	(4.4)	413	(4.1)	424	(4.4)	403	(6.0)	460	(5.2)	470	(4.5)	472	(5.2)	426	(5.4)	444	(5.1)	461	(4.8)	469	(4.2)	453	(5.4)
Ireland	530	(2.8)	530	(2.8)	513	(15.8)	531	(2.8)	505	(9.7)	490	(13.2)	519	(13.5)	518	(3.4)	544	(3.1)	546	(4.0)	527	(5.5)	495	(5.1)	524	(3.9)	532	(3.6)	547	(2.9)
Israel[9]	507	(3.9)	515	(3.7)	412	(10.7)	511	(3.8)	424	(9.9)	432	(16.8)	433	(12.9)	497	(5.6)	521	(4.7)	530	(4.1)	490	(6.0)	482	(6.8)	501	(5.2)	517	(4.5)	522	(3.9)
Italy[8]	499	(2.4)	501	(2.3)	466	(8.6)	499	(2.4)	462	(13.3)	469	(18.5)	464	(18.2)	485	(3.3)	509	(2.9)	512	(4.4)	494	(5.1)	470	(5.2)	494	(3.2)	511	(3.0)	508	(2.9)
Japan	571	(1.8)	574	(1.8)	546	(4.1)	574	(1.8)	547	(4.3)	528	(8.5)	553	(4.5)	549	(2.6)	582	(2.6)	582	(2.7)	569	(3.1)	526	(4.5)	562	(3.6)	570	(3.4)	579	(2.1)
Jordan	426	(3.4)	443	(3.1)	385	(4.6)	435	(3.3)	375	(5.9)	379	(8.7)	385	(7.4)	434	(3.6)	440	(3.7)	436	(7.3)	398	(6.0)	439	(4.4)	437	(4.8)	437	(5.0)	426	(3.8)
Kazakhstan	533	(4.4)	539	(4.5)	515	(8.0)	537	(4.3)	507	(9.2)	515	(8.1)	503	(12.3)	533	(4.7)	535	(5.2)	543	(6.4)	520	(8.6)	521	(5.6)	531	(5.0)	538	(6.0)	543	(5.7)
Korea, Republic of	556	(2.2)	557	(2.2)	512	(8.8)	557	(2.2)	508	(9.1)	515	(12.8)	504	(10.6)	554	(3.8)	566	(2.6)	557	(2.6)	539	(3.8)	536	(4.7)	555	(4.2)	559	(2.9)	560	(2.6)
Kuwait	411	(5.2)	414	(5.5)	371	(8.7)	416	(5.5)	338	(7.5)	344	(10.1)	344	(14.2)	407	(6.5)	424	(6.1)	420	(8.4)	395	(8.8)	394	(6.3)	432	(7.2)	431	(8.2)	418	(5.9)
Lebanon	398	(5.3)	408	(5.9)	369	(6.4)	403	(5.5)	355	(7.3)	363	(13.0)	352	(9.7)	401	(6.7)	405	(6.8)	409	(8.1)	370	(9.7)	410	(5.7)	406	(7.8)	402	(7.3)	393	(7.0)
Lithuania[8]	519	(2.8)	523	(2.7)	459	(9.2)	521	(2.7)	457	(11.4)	466	(13.9)	457	(26.1)	522	(3.2)	521	(3.5)	519	(5.5)	489	(8.8)	508	(5.0)	521	(4.3)	522	(3.8)	525	(3.2)
Malaysia	471	(4.1)	484	(4.2)	449	(5.0)	478	(4.0)	436	(5.6)	443	(6.1)	431	(6.7)	480	(4.4)	472	(4.5)	473	(5.3)	440	(5.9)	469	(4.4)	476	(4.5)	481	(4.8)	464	(4.9)
Malta	481	(1.6)	484	(1.6)	342	(23.1)	483	(1.6)	394	(22.1)	‡	(†)	‡	(†)	479	(2.1)	507	(4.0)	496	(4.6)	426	(10.1)	453	(3.9)	482	(3.4)	500	(4.5)	506	(2.9)
Morocco	393	(2.5)	409	(3.2)	384	(2.4)	400	(2.6)	379	(3.0)	380	(3.2)	388	(3.9)	396	(3.2)	399	(3.3)	400	(3.3)	389	(3.2)	393	(3.1)	403	(3.3)	396	(3.1)	398	(3.4)
New Zealand[7]	513	(3.1)	518	(3.0)	447	(5.8)	515	(3.1)	467	(7.6)	464	(8.0)	482	(11.3)	515	(3.1)	522	(4.3)	506	(5.9)	473	(7.9)	487	(4.2)	513	(3.0)	528	(4.4)	526	(4.5)
Norway[10]	509	(2.8)	510	(2.7)	‡	(†)	510	(2.7)	442	(16.2)	‡	(†)	‡	(†)	509	(3.8)	514	(2.9)	508	(4.5)	479	(7.6)	490	(5.7)	502	(5.1)	508	(3.1)	519	(3.0)
Oman	455	(2.7)	461	(2.7)	443	(4.0)	460	(2.5)	427	(5.4)	437	(5.9)	433	(6.2)	456	(3.3)	463	(3.6)	462	(4.0)	444	(4.5)	453	(3.5)	471	(3.6)	463	(2.8)	456	(3.7)
Qatar	457	(3.0)	464	(2.7)	345	(11.3)	462	(2.9)	355	(9.0)	342	(14.5)	374	(12.8)	466	(3.6)	459	(3.8)	454	(5.1)	413	(7.3)	447	(4.8)	462	(4.6)	462	(5.5)	467	(3.9)
Russian Federation	544	(4.2)	545	(4.2)	523	(12.6)	545	(4.0)	519	(15.9)	501	(20.8)	541	(16.0)	544	(4.4)	548	(5.2)	551	(5.8)	530	(9.2)	532	(4.9)	547	(5.8)	551	(5.1)	553	(4.1)
Saudi Arabia	396	(4.5)	404	(4.3)	339	(8.3)	402	(4.4)	345	(7.9)	361	(12.4)	348	(10.6)	401	(5.2)	404	(5.7)	413	(6.9)	351	(8.3)	404	(5.2)	408	(7.5)	409	(6.0)	398	(5.7)
Singapore[8]	597	(3.2)	599	(3.1)	498	(10.3)	599	(3.0)	510	(9.5)	494	(13.1)	522	(11.8)	603	(3.2)	602	(3.9)	594	(3.8)	566	(5.9)	582	(4.6)	595	(3.7)	597	(4.0)	603	(3.5)
Slovenia	551	(2.4)	551	(2.3)	541	(17.9)	551	(2.4)	539	(12.1)	530	(14.9)	559	(17.4)	541	(2.5)	568	(3.8)	578	(5.3)	552	(8.5)	522	(3.8)	540	(3.1)	557	(3.8)	567	(3.3)
Sweden	522	(3.4)	524	(3.4)	453	(17.8)	524	(3.4)	471	(21.0)	‡	(†)	‡	(†)	519	(5.0)	532	(3.5)	533	(4.7)	500	(6.8)	512	(5.4)	524	(5.3)	534	(4.0)	525	(4.1)
Thailand	456	(4.2)	470	(5.0)	432	(4.3)	463	(4.6)	429	(4.9)	434	(5.7)	426	(5.5)	467	(5.1)	457	(4.6)	452	(5.9)	428	(5.7)	455	(5.6)	466	(5.1)	462	(4.6)	452	(4.6)
Turkey	493	(4.0)	512	(4.4)	466	(4.4)	506	(4.2)	448	(4.5)	457	(4.8)	457	(6.4)	492	(4.4)	509	(4.4)	505	(6.0)	475	(5.6)	496	(5.0)	501	(5.0)	505	(5.0)	500	(5.3)
United Arab Emirates	477	(2.3)	481	(2.3)	406	(5.0)	479	(2.3)	405	(6.0)	404	(7.4)	412	(10.3)	479	(2.2)	489	(3.8)	466	(6.0)	407	(7.1)	453	(2.3)	488	(3.1)	495	(3.8)	494	(3.3)
United States[7]	530	(2.8)	533	(2.8)	488	(6.0)	532	(2.8)	491	(5.6)	484	(9.0)	500	(6.4)	530	(3.3)	537	(3.3)	534	(3.4)	513	(3.8)	515	(3.3)	528	(3.3)	536	(3.5)	539	(3.2)

See notes at end of table.

Table 20.1. Average science score and percentage of eighth-graders, by access to the Internet at home, access to a computer or tablet at home or other place outside of school, frequency of computer or tablet use for schoolwork outside of school, and country or other education system: 2015—Continued

[Standard errors appear in parentheses]

Country or other education system[1]	Total, all eighth-graders	Access to the Internet at home: Yes, has internet connection at home	Access to the Internet at home: No internet connection at home	Access to a computer or tablet outside of school: Access at home: Yes, has own or shared computer or tablet at home	Access at home: No access to computer or tablet at home	For students with no access at home, access at some other place outside of school: Yes, has access only at some other place[2]	For students with no access at home, access at some other place outside of school: No access outside of school	Frequency of computer or tablet use for schoolwork outside of school: At home: Every day or almost every day	At home: Once or twice a week	At home: Once or twice a month	At home: Never or almost never	At some other place than home or school: Every day or almost every day	At some other place than home or school: Once or twice a week	At some other place than home or school: Once or twice a month	At some other place than home or school: Never or almost never
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Benchmarking education systems															
Abu Dhabi (United Arab Emirates)	454 (5.6)	459 (5.6)	373 (10.0)	457 (5.6)	388 (11.6)	395 (13.1)	380 (18.3)	457 (4.9)	469 (9.9)	449 (13.7)	384 (11.1)	438 (4.2)	466 (7.2)	476 (8.5)	464 (9.2)
Buenos Aires[7] (Argentina)	386 (4.2)	389 (4.4)	354 (8.2)	388 (4.5)	338 (12.5)	‡ (†)	340 (19.7)	378 (5.0)	398 (5.6)	412 (7.3)	369 (10.9)	367 (7.8)	396 (6.8)	407 (6.1)	393 (5.3)
Dubai (United Arab Emirates)	525 (2.0)	526 (2.0)	472 (10.1)	526 (2.0)	435 (14.3)	424 (17.4)	453 (24.4)	527 (2.3)	528 (3.6)	509 (7.1)	467 (14.8)	494 (3.5)	531 (2.5)	537 (4.8)	541 (4.2)
Florida[6,11] (United States)	508 (6.0)	511 (6.0)	462 (10.9)	511 (5.9)	447 (12.9)	‡ (†)	454 (15.9)	513 (6.8)	510 (7.1)	499 (8.7)	495 (7.8)	503 (8.5)	505 (5.9)	519 (7.5)	513 (5.9)
Ontario (Canada)	524 (2.5)	526 (2.3)	474 (9.2)	526 (2.3)	476 (10.3)	‡ (†)	‡ (†)	528 (2.6)	527 (3.1)	517 (4.0)	502 (6.4)	517 (3.8)	522 (4.0)	529 (3.0)	533 (3.3)
Quebec[12] (Canada)	530 (4.4)	532 (4.1)	517 (11.8)	532 (4.0)	518 (14.4)	‡ (†)	527 (15.3)	531 (3.3)	537 (5.2)	541 (7.8)	518 (11.1)	517 (3.6)	533 (4.1)	545 (5.6)	539 (4.6)
	Percent of students														
International average[4]	**100.0 (†)**	**86.6 (0.12)**	**13.4 (0.12)**	**92.4 (0.10)**	**7.6 (0.10)**	**47.3 (0.85)**	**52.7 (0.85)**	**48.5 (0.18)**	**27.5 (0.13)**	**13.1 (0.11)**	**10.9 (0.12)**	**20.2 (0.13)**	**20.3 (0.12)**	**20.2 (0.12)**	**39.2 (0.16)**
Australia	100.0 (†)	95.1 (0.36)	4.9 (0.36)	98.3 (0.17)	1.7 (0.17)	50.4 (5.97)	49.6 (5.97)	59.1 (1.16)	27.4 (0.82)	8.4 (0.52)	5.1 (0.38)	16.5 (0.73)	26.2 (0.67)	22.2 (0.60)	35.0 (0.77)
Bahrain	100.0 (†)	95.3 (0.32)	4.7 (0.32)	94.3 (0.38)	5.7 (0.38)	55.8 (3.41)	44.2 (3.41)	59.4 (1.03)	24.1 (0.73)	10.4 (0.68)	6.2 (0.40)	35.3 (0.89)	21.9 (0.60)	18.3 (0.60)	24.4 (0.80)
Canada[5,6,7]	100.0 (†)	98.2 (0.22)	1.8 (0.22)	98.4 (0.17)	1.6 (0.17)	42.7 (6.16)	57.3 (6.16)	59.4 (1.02)	23.9 (0.74)	10.1 (0.62)	6.6 (0.40)	21.4 (0.73)	22.3 (0.72)	17.9 (0.54)	38.4 (0.99)
Chile	100.0 (†)	82.9 (0.89)	17.1 (0.89)	95.2 (0.39)	4.8 (0.39)	54.0 (3.65)	46.0 (3.65)	48.5 (0.92)	28.9 (0.82)	12.3 (0.51)	10.3 (0.68)	19.6 (0.81)	20.9 (0.76)	20.7 (0.61)	38.7 (0.79)
Chinese Taipei	100.0 (†)	90.4 (0.48)	9.6 (0.48)	96.7 (0.27)	3.3 (0.27)	33.7 (3.42)	66.3 (3.42)	23.4 (0.69)	26.4 (0.75)	29.3 (0.83)	20.9 (0.84)	8.1 (0.40)	10.8 (0.49)	18.8 (0.60)	62.3 (0.69)
Egypt	100.0 (†)	58.1 (1.18)	41.9 (1.18)	79.1 (1.01)	20.9 (1.01)	46.7 (2.06)	53.3 (2.06)	47.9 (1.01)	25.0 (0.69)	8.4 (0.45)	18.8 (0.93)	22.0 (0.78)	19.7 (0.81)	19.6 (0.75)	38.7 (1.21)
England (United Kingdom)	100.0 (†)	98.9 (0.21)	1.1 (0.21)	99.3 (0.14)	0.7 (0.14)	‡ (†)	66.5 (9.66)	60.0 (1.10)	29.1 (1.00)	6.9 (0.48)	4.0 (0.32)	14.0 (0.67)	22.2 (0.77)	23.0 (0.73)	40.7 (0.93)
Georgia[6,8]	100.0 (†)	81.6 (1.28)	18.4 (1.28)	87.1 (1.16)	12.9 (1.16)	65.5 (3.58)	34.5 (3.58)	53.4 (1.13)	24.8 (0.90)	11.8 (0.70)	10.0 (0.86)	24.4 (0.88)	23.2 (1.00)	20.4 (0.81)	32.1 (1.11)
Hong Kong (China)	100.0 (†)	95.9 (0.40)	4.1 (0.40)	97.6 (0.30)	2.4 (0.30)	30.7 (4.97)	69.3 (4.97)	41.0 (1.26)	25.8 (0.93)	19.6 (0.98)	13.6 (0.94)	10.6 (0.56)	12.2 (0.56)	16.2 (0.57)	61.1 (0.98)
Hungary	100.0 (†)	96.9 (0.42)	3.1 (0.42)	97.5 (0.37)	2.5 (0.37)	58.1 (6.49)	41.9 (6.49)	53.1 (1.13)	25.8 (0.73)	15.0 (0.69)	6.1 (0.67)	18.6 (0.82)	18.7 (0.71)	21.2 (0.63)	41.5 (1.01)
Iran, Islamic Republic of	100.0 (†)	56.9 (1.33)	43.1 (1.33)	78.3 (1.19)	21.7 (1.19)	50.6 (2.41)	49.4 (2.41)	36.2 (1.04)	28.1 (0.84)	14.7 (0.56)	21.0 (1.20)	12.4 (0.74)	21.6 (0.83)	30.4 (0.77)	35.6 (1.31)
Ireland	100.0 (†)	98.3 (0.22)	1.7 (0.22)	98.0 (0.35)	2.0 (0.35)	42.8 (6.16)	57.2 (6.16)	46.0 (1.32)	28.6 (1.00)	15.7 (0.74)	9.7 (0.59)	16.3 (0.64)	17.9 (0.75)	17.2 (0.64)	48.6 (0.87)
Israel[9]	100.0 (†)	93.7 (0.53)	6.3 (0.53)	96.3 (0.31)	3.7 (0.31)	40.8 (4.36)	59.2 (4.36)	41.6 (0.89)	24.6 (0.73)	20.9 (0.64)	12.9 (0.61)	18.5 (0.70)	15.8 (0.54)	19.0 (0.58)	46.7 (0.94)
Italy[6]	100.0 (†)	95.3 (0.38)	4.7 (0.38)	98.1 (0.27)	1.9 (0.27)	38.7 (5.88)	61.3 (5.88)	35.0 (1.16)	36.0 (0.93)	16.6 (0.78)	12.4 (0.73)	14.3 (0.69)	19.6 (0.71)	19.9 (0.72)	46.2 (0.96)
Japan	100.0 (†)	88.6 (0.55)	11.4 (0.55)	90.2 (0.56)	9.8 (0.56)	20.3 (2.16)	79.7 (2.16)	20.2 (0.79)	22.8 (0.76)	26.9 (0.58)	30.2 (0.99)	8.2 (0.51)	10.6 (0.52)	13.4 (0.57)	67.9 (1.07)
Jordan	100.0 (†)	76.0 (1.01)	24.0 (1.01)	86.9 (0.77)	13.1 (0.77)	43.5 (2.60)	56.5 (2.60)	56.1 (1.01)	24.3 (0.60)	8.2 (0.36)	11.4 (0.77)	26.6 (0.74)	20.4 (0.57)	21.9 (0.60)	31.2 (0.96)
Kazakhstan	100.0 (†)	75.7 (1.52)	24.3 (1.52)	85.8 (1.00)	14.2 (1.00)	56.3 (2.34)	43.7 (2.34)	42.2 (1.24)	32.8 (0.93)	12.1 (0.63)	12.9 (0.82)	21.7 (1.05)	20.2 (0.79)	23.6 (0.99)	34.6 (1.27)
Korea, Republic of	100.0 (†)	97.2 (0.28)	2.8 (0.28)	97.1 (0.26)	2.9 (0.26)	47.4 (4.62)	52.6 (4.62)	25.8 (0.76)	30.9 (0.91)	25.5 (0.76)	17.8 (0.77)	12.0 (0.50)	17.8 (0.60)	19.7 (0.60)	50.6 (0.78)
Kuwait	100.0 (†)	93.2 (0.61)	6.8 (0.61)	92.9 (0.56)	7.1 (0.56)	65.7 (2.91)	34.3 (2.91)	56.3 (1.33)	27.4 (0.83)	9.7 (0.79)	6.6 (0.61)	38.4 (1.50)	21.2 (0.89)	13.1 (0.69)	27.4 (1.41)
Lebanon	100.0 (†)	78.5 (0.94)	21.5 (0.94)	92.5 (0.65)	7.5 (0.65)	60.6 (4.77)	39.4 (4.77)	55.7 (1.49)	24.6 (1.00)	11.8 (0.97)	7.9 (1.07)	32.3 (1.24)	21.0 (0.87)	19.8 (1.03)	26.9 (1.20)
Lithuania[6]	100.0 (†)	94.9 (0.53)	5.1 (0.53)	97.6 (0.27)	2.4 (0.27)	63.4 (7.19)	36.6 (7.19)	55.1 (1.16)	28.0 (0.94)	10.8 (0.62)	6.2 (0.52)	13.2 (0.75)	18.0 (0.66)	23.4 (0.93)	45.5 (1.09)
Malaysia	100.0 (†)	64.8 (1.20)	35.2 (1.20)	82.3 (0.83)	17.7 (0.83)	57.8 (1.57)	42.2 (1.57)	47.9 (0.98)	26.2 (0.63)	12.8 (0.39)	13.1 (0.69)	23.7 (0.69)	22.4 (0.66)	24.3 (0.64)	29.5 (0.89)
Malta	100.0 (†)	99.0 (0.14)	1.0 (0.14)	99.2 (0.16)	0.8 (0.16)	‡ (†)	66.4 (10.45)	67.9 (0.78)	20.8 (0.70)	8.0 (0.38)	3.3 (0.26)	25.0 (0.64)	24.4 (0.61)	19.2 (0.57)	31.4 (0.75)
Morocco	100.0 (†)	43.9 (0.84)	56.1 (0.84)	69.8 (0.84)	30.2 (0.84)	48.5 (1.53)	51.5 (1.53)	37.1 (1.00)	26.2 (0.59)	9.7 (0.38)	27.1 (1.09)	21.6 (0.68)	24.4 (0.65)	21.6 (0.52)	32.4 (0.94)
New Zealand[7]	100.0 (†)	93.0 (0.38)	7.0 (0.38)	96.5 (0.22)	3.5 (0.22)	60.0 (2.91)	40.0 (2.91)	63.4 (0.95)	23.5 (0.74)	7.9 (0.52)	5.2 (0.38)	20.0 (0.70)	29.8 (0.97)	22.8 (0.81)	27.4 (0.91)
Norway[10]	100.0 (†)	99.4 (0.09)	0.6 (0.09)	99.1 (0.16)	0.9 (0.16)	38.8 (9.41)	61.2 (9.41)	37.9 (1.60)	40.6 (0.91)	17.0 (1.07)	4.4 (0.57)	10.0 (0.72)	18.6 (0.73)	27.0 (0.84)	44.3 (1.00)
Oman	100.0 (†)	71.4 (1.03)	28.6 (1.03)	85.3 (0.65)	14.7 (0.65)	42.8 (1.60)	57.2 (1.60)	40.8 (1.04)	32.9 (0.86)	12.3 (0.44)	14.1 (0.58)	22.3 (0.74)	20.8 (0.46)	22.1 (0.62)	34.8 (0.88)
Qatar	100.0 (†)	94.6 (0.47)	5.4 (0.47)	96.4 (0.28)	3.6 (0.28)	38.4 (3.92)	61.6 (3.92)	51.6 (1.04)	29.5 (0.64)	12.8 (0.59)	6.1 (0.45)	22.3 (0.68)	21.1 (0.73)	19.7 (0.74)	36.8 (1.04)
Russian Federation	100.0 (†)	96.2 (0.44)	3.8 (0.44)	97.5 (0.26)	2.5 (0.26)	48.3 (5.61)	51.7 (5.61)	67.9 (0.82)	21.0 (0.73)	6.4 (0.44)	4.8 (0.44)	29.8 (0.93)	19.6 (0.70)	14.8 (0.80)	35.8 (0.96)
Saudi Arabia	100.0 (†)	91.0 (0.69)	9.0 (0.69)	91.1 (0.71)	8.9 (0.71)	45.8 (4.45)	54.2 (4.45)	53.2 (1.27)	26.7 (0.99)	12.1 (0.54)	8.0 (0.73)	28.5 (1.04)	17.4 (0.76)	17.7 (0.91)	36.4 (1.28)
Singapore[8]	100.0 (†)	97.5 (0.23)	2.5 (0.23)	97.3 (0.27)	2.7 (0.27)	36.9 (4.14)	63.1 (4.14)	41.7 (0.69)	27.6 (0.67)	21.2 (0.56)	9.5 (0.44)	14.4 (0.51)	15.2 (0.47)	18.9 (0.55)	51.4 (0.73)
Slovenia	100.0 (†)	99.0 (0.18)	1.0 (0.18)	98.2 (0.23)	1.8 (0.23)	50.5 (5.80)	49.5 (5.80)	61.6 (1.11)	25.1 (0.87)	10.1 (0.55)	3.3 (0.28)	15.3 (0.66)	21.2 (0.87)	21.5 (0.70)	42.0 (0.97)
Sweden	100.0 (†)	98.9 (0.18)	1.1 (0.18)	99.2 (0.17)	0.8 (0.17)	‡ (†)	52.9 (10.73)	43.0 (1.99)	36.4 (0.96)	13.8 (1.07)	6.8 (0.73)	16.1 (0.92)	20.5 (0.74)	23.3 (0.87)	40.0 (1.34)
Thailand	100.0 (†)	64.0 (1.37)	36.0 (1.37)	79.3 (1.02)	20.7 (1.02)	54.7 (2.49)	45.3 (2.49)	48.2 (1.13)	27.5 (0.74)	8.8 (0.46)	15.6 (0.81)	20.0 (0.69)	25.2 (0.77)	19.6 (0.81)	35.2 (1.00)
Turkey	100.0 (†)	61.1 (1.41)	38.9 (1.41)	78.3 (1.40)	21.7 (1.40)	50.6 (2.18)	49.4 (2.18)	35.3 (0.86)	36.1 (1.01)	11.8 (0.49)	16.8 (0.97)	19.8 (1.01)	26.9 (0.85)	19.8 (0.74)	33.5 (1.05)
United Arab Emirates	100.0 (†)	94.9 (0.24)	5.1 (0.24)	97.2 (0.17)	2.8 (0.17)	56.4 (2.93)	43.6 (2.93)	70.8 (0.70)	21.9 (0.61)	4.0 (0.19)	3.3 (0.18)	33.4 (0.56)	23.9 (0.43)	17.2 (0.43)	25.4 (0.51)
United States[7]	100.0 (†)	95.0 (0.29)	5.0 (0.29)	96.6 (0.22)	3.4 (0.22)	39.7 (2.45)	60.3 (2.45)	51.0 (1.04)	26.4 (0.68)	12.1 (0.55)	10.5 (0.56)	22.0 (0.57)	18.2 (0.38)	18.2 (0.50)	41.6 (0.86)

See notes at end of table.

Table 20.1. Average science score and percentage of eighth-graders, by access to the Internet at home, access to a computer or tablet at home or other place outside of school, frequency of computer or tablet use for schoolwork outside of school, and country or other education system: 2015—Continued

[Standard errors appear in parentheses]

Country or other education system[1]	Total, all eighth-graders	Access to the Internet at home		Access to a computer or tablet outside of school				Frequency of computer or tablet use for schoolwork outside of school							
				Access at home		For students with no access at home, access at some other place outside of school		At home				At some other place than home or school			
		Yes, has internet connection at home	No internet connection at home	Yes, has own or shared computer or tablet at home	No access to computer or tablet at home	Yes, has access only at some other place[2]	No access outside of school	Every day or almost every day	Once or twice a week	Once or twice a month	Never or almost never	Every day or almost every day	Once or twice a week	Once or twice a month	Never or almost never
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Benchmarking education systems															
Abu Dhabi (United Arab Emirates)	100.0 (†)	95.2 (0.41)	4.8 (0.41)	96.9 (0.37)	3.1 (0.37)	53.8 (4.48)	46.2 (4.48)	71.9 (1.48)	20.2 (1.20)	3.9 (0.41)	3.9 (0.36)	36.6 (1.15)	23.8 (0.84)	16.0 (0.71)	23.6 (1.10)
Buenos Aires[7] (Argentina)	100.0 (†)	90.4 (0.75)	9.6 (0.75)	96.2 (0.47)	3.8 (0.47)	45.2 (5.39)	54.8 (5.39)	50.0 (1.38)	28.6 (1.00)	11.9 (0.85)	9.5 (0.76)	16.4 (0.89)	17.1 (0.74)	19.6 (0.85)	47.0 (1.07)
Dubai (United Arab Emirates)	100.0 (†)	97.5 (0.23)	2.5 (0.23)	98.9 (0.15)	1.1 (0.15)	60.4 (7.06)	39.6 (7.06)	72.7 (0.74)	22.2 (0.68)	3.4 (0.24)	1.6 (0.20)	25.8 (0.71)	26.2 (0.58)	20.1 (0.66)	27.9 (0.92)
Florida[6,11] (United States)	100.0 (†)	95.7 (0.68)	4.3 (0.68)	96.8 (0.53)	3.2 (0.53)	41.6 (5.58)	58.4 (5.58)	58.6 (2.38)	22.1 (1.19)	11.0 (0.93)	8.2 (0.87)	24.3 (1.41)	18.6 (0.70)	18.2 (0.96)	38.9 (1.18)
Ontario (Canada)	100.0 (†)	98.1 (0.28)	1.9 (0.28)	98.7 (0.22)	1.3 (0.22)	53.7 (8.84)	46.3 (8.84)	61.9 (1.39)	24.1 (1.04)	8.7 (0.66)	5.4 (0.53)	21.7 (1.04)	23.2 (0.93)	19.1 (0.67)	35.9 (1.29)
Quebec[12] (Canada)	100.0 (†)	98.7 (0.21)	1.3 (0.21)	98.3 (0.31)	1.7 (0.31)	39.9 (7.89)	60.1 (7.89)	58.8 (1.35)	21.5 (1.16)	12.0 (1.02)	7.7 (0.72)	22.1 (0.91)	21.1 (1.02)	14.7 (1.04)	42.1 (1.32)

†Not applicable.
‡Reporting standards not met. Either there are too few cases for a reliable estimate or the coefficient of variation (CV) is 50 percent or greater.
[1]Most of the education systems represent complete countries, but some represent subnational entities; examples include two Canadian provinces (Ontario and Quebec), a component of the United Kingdom (England), the U.S. state of Florida, and a few individual cities (such as Abu Dhabi within the United Arab Emirates).
[2]Students were asked how often they used a computer or tablet to do schoolwork "(including classroom tasks, homework, studying outside of class)" in each of the following three places: "at home," "at school," and "some other place." The frequency choices were "Every day or almost every day," "Once or twice a week," "Once or twice a month," and "Never or almost never." If students had no access to a computer or tablet at home, and their frequency at "some other place" was at least "once or twice a month," they are classified as having access to a computer or tablet outside of school only at some other place.
[3]Trends in International Mathematics and Science Study (TIMSS) scores are reported on a scale from 0 to 1,000, with the scale centerpoint set at 500 and the standard deviation set at 100.
[4]The international average includes only education systems that are members of the International Association for the Evaluation of Educational Achievement (IEA), which develops and implements TIMSS at the international level. "Benchmarking" education systems are not members of the IEA and are therefore not included in the average.
[5]Data for Canada include only students from the provinces of Manitoba, Newfoundland, Ontario, and Quebec.
[6]National Target Population does not include all of the International Target Population.
[7]Met guidelines for sample participation rates only after replacement schools were included.
[8]National Defined Population covers 90 to 95 percent of National Target Population.
[9]National Defined Population covers less than 90 percent of the National Target Population (but at least 77 percent).
[10]Norway collected data from students in their ninth year of schooling rather than in grade 8 because year 1 in Norway is considered the equivalent of kindergarten rather than the first year of primary school.
[11]U.S. state-level data are based on public school students only.
[12]Did not satisfy guidelines for sample participation rates.
NOTE: Countries and other education systems were required to draw probability samples of students who were nearing the end of their eighth year of formal schooling (counting the first year of primary school as year 1), provided that the mean age at the time of testing was at least 13.5 years. Detail may not sum to totals because of rounding.
SOURCE: International Association for the Evaluation of Educational Achievement (IEA), Trends in International Mathematics and Science Study (TIMSS), 2015. (This table was prepared January 2017.)

Table 21.1. Average reading literacy, mathematics literacy, and science literacy scores of 15-year-old students, by computer and internet access at home and country or other education system: 2015

[Standard errors appear in parentheses]

Country or other education system	Reading literacy								Mathematics literacy								Science literacy							
	Access to a computer at home for schoolwork				Access to the Internet at home				Access to a computer at home for schoolwork				Access to the Internet at home				Access to a computer at home for schoolwork				Access to the Internet at home			
	Yes		No		Yes		No		Yes		No		Yes		No		Yes		No		Yes		No	
1	2		3		4		5		6		7		8		9		10		11		12		13	
OECD average[1]	**499**	**(0.5)**	**436**	**(1.3)**	**497**	**(0.5)**	**415**	**(2.1)**	**496**	**(0.4)**	**440**	**(1.2)**	**494**	**(0.4)**	**420**	**(1.9)**	**499**	**(0.4)**	**441**	**(1.1)**	**498**	**(0.4)**	**424**	**(1.8)**
Australia	509	(1.7)	426	(6.0)	508	(1.7)	428	(7.4)	500	(1.6)	429	(3.9)	499	(1.6)	428	(6.7)	516	(1.5)	437	(4.0)	515	(1.5)	433	(5.8)
Austria	487	(2.8)	420	(8.5)	487	(2.7)	383	(12.4)	499	(2.8)	432	(8.3)	499	(2.8)	395	(13.0)	497	(2.4)	431	(7.8)	497	(2.4)	406	(10.5)
Belgium	504	(2.3)	417	(6.7)	502	(2.3)	401	(10.9)	512	(2.3)	434	(6.0)	510	(2.3)	425	(10.4)	507	(2.2)	425	(5.7)	505	(2.2)	410	(9.3)
Canada	532	(2.2)	464	(4.8)	530	(2.2)	455	(10.6)	520	(2.3)	457	(5.2)	518	(2.3)	454	(8.5)	532	(2.1)	471	(4.4)	531	(2.1)	470	(8.4)
Chile	468	(2.6)	417	(4.1)	468	(2.7)	421	(4.6)	431	(2.7)	387	(4.3)	431	(2.6)	389	(4.0)	455	(2.5)	412	(3.8)	456	(2.5)	412	(3.8)
Czech Republic	494	(2.4)	412	(8.3)	491	(2.4)	414	(14.1)	498	(2.2)	414	(7.9)	496	(2.2)	408	(12.2)	499	(2.1)	417	(6.4)	496	(2.1)	423	(10.2)
Denmark	502	(2.5)	439	(10.3)	501	(2.5)	413	(20.3)	513	(2.2)	450	(8.8)	512	(2.2)	434	(14.3)	504	(2.4)	426	(8.5)	503	(2.4)	417	(18.8)
Estonia	520	(2.3)	519	(5.3)	520	(2.2)	456	(15.6)	522	(2.0)	512	(4.9)	521	(2.0)	456	(14.0)	536	(2.1)	530	(5.1)	535	(2.1)	481	(17.0)
Finland	530	(2.4)	474	(9.7)	528	(2.5)	353	(29.4)	514	(2.3)	470	(8.6)	512	(2.3)	383	(27.8)	534	(2.3)	481	(8.7)	532	(2.3)	407	(22.8)
France	507	(2.3)	424	(7.2)	503	(2.3)	413	(15.3)	499	(2.0)	431	(5.8)	496	(2.0)	410	(11.3)	502	(1.9)	429	(6.1)	498	(1.9)	417	(12.7)
Germany	521	(3.0)	427	(7.8)	518	(3.0)	413	(10.7)	514	(2.9)	440	(7.6)	512	(2.9)	432	(9.5)	519	(2.7)	442	(6.5)	517	(2.7)	437	(8.8)
Greece	474	(3.9)	406	(7.5)	473	(4.1)	398	(8.4)	459	(3.5)	409	(6.7)	458	(3.6)	412	(8.7)	462	(3.6)	400	(7.0)	460	(3.7)	401	(8.4)
Hungary	476	(2.6)	392	(6.7)	473	(2.7)	396	(9.5)	483	(2.5)	409	(6.8)	480	(2.6)	413	(9.7)	483	(2.4)	403	(6.6)	480	(2.5)	407	(9.4)
Iceland	484	(2.0)	428	(16.4)	484	(2.0)	‡	(†)	490	(2.1)	444	(13.1)	489	(2.1)	‡	(†)	475	(1.7)	432	(12.5)	475	(1.7)	‡	(†)
Ireland	527	(2.4)	487	(4.3)	524	(2.4)	447	(8.9)	509	(2.0)	471	(4.0)	506	(2.0)	453	(10.7)	508	(2.3)	469	(4.4)	505	(2.3)	435	(9.9)
Israel	487	(3.9)	395	(7.8)	487	(4.0)	376	(9.8)	477	(3.7)	396	(7.7)	477	(3.9)	384	(8.6)	476	(3.5)	395	(7.1)	476	(3.7)	380	(7.9)
Italy	490	(2.6)	443	(8.2)	488	(2.7)	433	(8.5)	494	(2.9)	458	(5.7)	493	(2.9)	444	(7.0)	485	(2.5)	443	(5.9)	484	(2.5)	434	(6.4)
Japan	529	(3.2)	496	(3.6)	521	(3.1)	468	(5.4)	544	(3.1)	516	(3.4)	538	(3.0)	485	(5.1)	550	(3.1)	521	(3.4)	544	(2.9)	492	(4.6)
Korea, Republic of	523	(3.4)	471	(6.5)	522	(3.4)	422	(9.8)	528	(3.7)	485	(6.2)	528	(3.7)	427	(9.2)	520	(3.1)	478	(5.4)	519	(3.1)	428	(7.5)
Latvia	490	(1.7)	445	(10.5)	490	(1.7)	423	(15.4)	485	(1.9)	429	(9.3)	484	(1.9)	404	(13.3)	493	(1.6)	451	(8.0)	492	(1.5)	430	(13.0)
Luxembourg	486	(1.5)	418	(6.3)	485	(1.5)	396	(8.3)	490	(1.4)	430	(5.8)	489	(1.3)	411	(7.5)	487	(1.2)	424	(5.3)	486	(1.2)	405	(6.9)
Mexico	446	(2.9)	397	(2.9)	443	(3.1)	402	(2.9)	426	(2.7)	388	(2.5)	423	(2.7)	393	(2.4)	435	(2.5)	394	(2.2)	432	(2.7)	399	(2.2)
Netherlands	507	(2.5)	427	(9.0)	505	(2.4)	400	(15.4)	515	(2.2)	445	(8.5)	514	(2.2)	408	(13.4)	512	(2.3)	440	(8.6)	511	(2.2)	414	(12.4)
New Zealand	518	(2.6)	436	(6.5)	515	(2.5)	437	(9.8)	502	(2.3)	435	(5.7)	500	(2.3)	428	(7.8)	521	(2.4)	443	(5.9)	519	(2.4)	440	(7.5)
Norway	517	(2.4)	456	(11.0)	516	(2.4)	466	(17.0)	505	(2.2)	442	(8.3)	504	(2.2)	435	(15.0)	502	(2.1)	434	(9.8)	501	(2.1)	437	(13.3)
Poland	507	(2.5)	468	(10.6)	507	(2.5)	452	(12.5)	506	(2.4)	469	(9.4)	506	(2.4)	450	(12.2)	503	(2.5)	472	(10.5)	503	(2.5)	458	(13.0)
Portugal	502	(2.7)	429	(7.0)	502	(2.6)	409	(9.2)	495	(2.5)	428	(7.6)	495	(2.4)	409	(8.7)	505	(2.4)	436	(5.5)	504	(2.4)	426	(8.2)
Slovak Republic	465	(2.7)	351	(6.6)	462	(2.7)	320	(7.8)	486	(2.6)	385	(6.2)	483	(2.6)	365	(7.6)	471	(2.5)	373	(6.4)	468	(2.5)	354	(7.4)
Slovenia	508	(1.5)	456	(8.9)	507	(1.5)	433	(15.2)	512	(1.3)	464	(7.6)	511	(1.3)	459	(15.2)	516	(1.3)	463	(7.6)	514	(1.3)	448	(11.8)
Spain	500	(2.3)	446	(5.4)	499	(2.3)	438	(6.3)	491	(2.1)	434	(5.6)	489	(2.2)	428	(6.6)	498	(2.0)	441	(5.3)	496	(2.0)	433	(5.6)
Sweden	505	(3.4)	447	(8.2)	504	(3.3)	413	(14.5)	497	(3.1)	445	(6.4)	497	(3.0)	424	(10.9)	497	(3.6)	445	(6.4)	497	(3.5)	429	(11.5)
Switzerland	495	(3.0)	438	(9.9)	494	(3.0)	380	(15.4)	524	(2.9)	471	(8.7)	523	(2.9)	416	(15.8)	508	(2.9)	460	(9.2)	507	(2.8)	408	(15.5)
Turkey	445	(4.2)	398	(4.3)	445	(4.1)	403	(4.6)	436	(4.4)	394	(4.5)	437	(4.4)	397	(4.6)	441	(4.1)	398	(4.3)	441	(4.0)	402	(4.6)
United Kingdom	504	(2.8)	451	(5.8)	501	(2.8)	414	(13.5)	498	(2.5)	451	(6.1)	496	(2.5)	421	(13.5)	515	(2.6)	457	(5.1)	513	(2.5)	423	(13.2)
United States	505	(3.3)	454	(5.5)	503	(3.2)	431	(7.7)	477	(3.2)	433	(4.4)	475	(3.1)	413	(5.1)	504	(3.1)	454	(4.6)	503	(3.0)	430	(5.2)
Non-OECD education systems																								
Albania	‡	(†)	‡	(†)	‡	(†)	‡	(†)	‡	(†)	‡	(†)	‡	(†)	‡	(†)	‡	(†)	‡	(†)	‡	(†)	‡	(†)
Algeria	359	(3.8)	342	(3.1)	358	(4.3)	347	(3.0)	371	(3.9)	351	(2.9)	372	(4.6)	355	(3.0)	386	(3.4)	367	(2.6)	386	(4.0)	372	(2.6)
Beijing, Shanghai, Jiangsu, Guangdong (China)	526	(5.4)	449	(6.1)	529	(4.6)	423	(5.7)	558	(5.7)	495	(5.3)	561	(4.9)	470	(5.2)	546	(5.2)	479	(5.3)	549	(4.4)	454	(5.0)
Brazil	430	(3.1)	372	(3.0)	420	(2.9)	370	(3.7)	397	(3.1)	345	(2.8)	388	(3.0)	343	(4.0)	422	(2.7)	367	(2.0)	411	(2.5)	368	(2.9)
Buenos Aires (Argentina)	481	(7.3)	420	(11.1)	482	(7.4)	412	(12.4)	462	(7.1)	405	(9.9)	462	(7.0)	394	(10.7)	481	(6.5)	423	(8.2)	481	(6.5)	414	(9.4)
Bulgaria	441	(4.6)	340	(9.4)	440	(4.6)	311	(11.0)	448	(3.8)	376	(8.5)	447	(3.8)	349	(10.0)	454	(4.1)	369	(8.0)	453	(4.0)	343	(9.2)
Chinese Taipei	504	(2.6)	454	(4.6)	499	(2.5)	449	(7.3)	550	(3.1)	494	(5.2)	546	(3.0)	479	(8.3)	540	(2.8)	487	(4.4)	535	(2.7)	480	(6.9)
Colombia	449	(2.7)	388	(3.9)	446	(2.8)	394	(3.7)	407	(2.4)	363	(3.0)	405	(2.4)	368	(3.0)	436	(2.4)	385	(3.0)	433	(2.4)	391	(3.0)
Costa Rica	444	(2.6)	386	(3.4)	441	(2.8)	394	(3.1)	412	(2.7)	369	(2.7)	411	(2.8)	374	(2.8)	432	(2.2)	387	(2.9)	431	(2.3)	392	(2.6)
Croatia	491	(2.7)	452	(5.6)	489	(2.7)	433	(11.9)	468	(2.8)	424	(5.1)	466	(2.8)	412	(12.0)	479	(2.5)	440	(5.0)	477	(2.5)	433	(10.2)

See notes at end of table.

Table 21.1. Average reading literacy, mathematics literacy, and science literacy scores of 15-year-old students, by computer and internet access at home and country or other education system: 2015—Continued

[Standard errors appear in parentheses]

Country or other education system	Reading literacy								Mathematics literacy								Science literacy							
	Access to a computer at home for schoolwork				Access to the Internet at home				Access to a computer at home for schoolwork				Access to the Internet at home				Access to a computer at home for schoolwork				Access to the Internet at home			
	Yes		No		Yes		No		Yes		No		Yes		No		Yes		No		Yes		No	
1	2		3		4		5		6		7		8		9		10		11		12		13	
Cyprus	450	(1.8)	382	(5.7)	448	(1.8)	372	(7.7)	444	(1.6)	385	(5.1)	442	(1.6)	365	(7.7)	439	(1.4)	379	(4.6)	437	(1.4)	369	(6.3)
Dominican Republic	379	(3.9)	337	(3.2)	373	(3.5)	333	(3.5)	344	(3.6)	315	(3.1)	340	(3.2)	313	(3.5)	350	(3.5)	316	(2.4)	346	(3.1)	311	(2.8)
Georgia	417	(2.9)	353	(4.8)	412	(3.0)	352	(5.3)	416	(2.8)	369	(4.1)	413	(2.8)	368	(5.1)	422	(2.5)	380	(3.4)	418	(2.5)	382	(4.2)
Hong Kong (China)	531	(2.7)	469	(6.1)	530	(2.6)	422	(11.8)	551	(2.9)	502	(6.3)	550	(2.9)	462	(10.6)	527	(2.5)	480	(5.3)	526	(2.5)	441	(9.7)
Indonesia	436	(4.0)	383	(3.1)	426	(3.2)	384	(3.2)	433	(4.7)	369	(3.1)	419	(4.0)	372	(3.0)	439	(4.4)	390	(2.6)	429	(3.4)	391	(2.6)
Jordan	422	(3.0)	370	(4.6)	423	(2.9)	370	(4.4)	394	(2.6)	348	(4.3)	393	(2.7)	352	(4.5)	422	(2.6)	373	(4.0)	422	(2.6)	376	(3.9)
Kosovo	353	(1.5)	328	(5.6)	353	(1.5)	317	(5.5)	367	(1.7)	344	(4.4)	368	(1.7)	325	(5.8)	383	(1.8)	363	(4.1)	384	(1.8)	351	(4.8)
Lebanon	366	(4.8)	293	(4.8)	362	(4.8)	296	(5.7)	412	(3.9)	354	(4.9)	409	(3.8)	356	(5.6)	400	(3.7)	351	(4.0)	398	(3.6)	351	(4.5)
Lithuania	476	(2.7)	405	(7.5)	476	(2.7)	402	(8.7)	482	(2.3)	416	(8.4)	482	(2.3)	413	(7.4)	479	(2.6)	415	(8.1)	479	(2.6)	415	(8.2)
Macao (China)	511	(1.3)	469	(5.5)	510	(1.3)	454	(10.7)	546	(1.2)	502	(5.2)	545	(1.1)	490	(11.5)	531	(1.1)	485	(4.6)	530	(1.1)	466	(9.9)
Macedonia, Republic of	359	(1.4)	292	(5.9)	358	(1.4)	290	(7.0)	379	(1.3)	310	(7.1)	378	(1.3)	309	(8.5)	390	(1.3)	338	(5.0)	389	(1.3)	335	(6.5)
Malta	453	(1.9)	363	(9.8)	453	(1.8)	300	(15.0)	485	(1.9)	401	(8.9)	484	(1.8)	338	(13.9)	471	(1.8)	389	(8.7)	470	(1.7)	328	(12.8)
Massachusetts[2] (USA)	534	(5.8)	459	(10.6)	531	(6.0)	460	(19.0)	507	(5.4)	435	(10.1)	504	(5.4)	440	(13.8)	536	(6.6)	458	(9.1)	533	(6.6)	456	(14.4)
Moldova, Republic of	429	(2.6)	371	(4.5)	428	(2.7)	363	(4.5)	431	(2.5)	379	(5.4)	430	(2.5)	370	(6.4)	439	(2.0)	392	(4.1)	438	(2.0)	381	(4.5)
Montenegro, Republic of	433	(1.8)	396	(4.7)	433	(1.8)	396	(4.7)	423	(1.6)	392	(4.3)	422	(1.6)	392	(5.1)	417	(1.2)	383	(4.1)	416	(1.2)	386	(4.6)
North Carolina[2] (USA)	507	(5.4)	443	(9.4)	503	(5.4)	453	(10.5)	478	(4.3)	421	(7.5)	474	(4.5)	429	(7.4)	509	(4.9)	451	(9.0)	506	(4.9)	459	(9.8)
Peru	433	(3.4)	358	(2.4)	435	(3.7)	367	(2.8)	414	(3.3)	356	(2.4)	415	(3.5)	363	(2.7)	424	(2.8)	366	(2.0)	424	(3.0)	374	(2.3)
Puerto Rico (USA)	421	(7.5)	387	(6.6)	416	(7.1)	385	(11.2)	388	(6.4)	355	(4.8)	382	(5.8)	361	(8.7)	413	(6.6)	374	(5.8)	406	(6.2)	382	(9.6)
Qatar	415	(1.2)	336	(2.9)	412	(1.1)	311	(4.2)	413	(1.3)	352	(3.8)	410	(1.4)	332	(4.0)	428	(1.1)	366	(2.8)	426	(1.1)	345	(3.3)
Romania	442	(3.9)	383	(6.2)	442	(4.0)	387	(5.8)	451	(3.8)	401	(6.0)	450	(3.8)	405	(6.2)	442	(3.2)	393	(5.0)	442	(3.2)	396	(5.0)
Russian Federation	500	(3.0)	455	(7.6)	499	(3.1)	449	(11.3)	498	(3.1)	468	(9.7)	497	(3.1)	467	(10.8)	491	(2.8)	457	(8.5)	490	(2.9)	455	(8.4)
Singapore	544	(1.9)	464	(4.5)	539	(1.6)	421	(9.3)	572	(1.7)	495	(3.9)	567	(1.4)	462	(9.3)	565	(1.5)	479	(4.4)	559	(1.2)	438	(8.4)
Thailand	427	(4.0)	383	(2.8)	421	(3.9)	384	(3.3)	428	(3.8)	395	(3.1)	424	(3.6)	395	(3.6)	438	(3.6)	398	(2.4)	433	(3.4)	397	(3.0)
Trinidad and Tobago	438	(1.9)	385	(4.2)	438	(1.8)	376	(4.4)	427	(1.6)	378	(4.3)	427	(1.7)	372	(4.2)	434	(1.6)	386	(3.8)	434	(1.6)	382	(4.5)
Tunisia	377	(3.3)	335	(4.0)	374	(3.3)	338	(3.9)	383	(3.5)	340	(3.5)	380	(3.4)	342	(3.5)	399	(2.6)	368	(2.3)	396	(2.5)	369	(2.5)
United Arab Emirates	442	(2.7)	380	(5.2)	440	(2.8)	355	(5.6)	435	(2.3)	383	(5.1)	433	(2.3)	365	(5.6)	444	(2.3)	393	(4.5)	443	(2.3)	367	(4.2)
Uruguay	446	(2.6)	402	(5.0)	447	(2.5)	385	(4.8)	426	(2.5)	392	(5.5)	426	(2.5)	382	(5.6)	443	(2.2)	405	(4.3)	444	(2.2)	393	(3.9)
Vietnam	509	(4.4)	470	(3.5)	510	(4.7)	468	(3.7)	519	(5.4)	476	(4.4)	519	(5.5)	474	(4.4)	545	(5.0)	509	(3.5)	545	(5.1)	508	(3.6)

†Not applicable.
‡Reporting standards not met (too few cases for a reliable estimate).
[1]Refers to the mean of the data values for all Organization for Economic Cooperation and Development (OECD) countries, to which each country contributes equally, regardless of the absolute size of the student population of each country.
[2]Results are for public school students only.
NOTE: Program for International Student Assessment (PISA) scores are reported on a scale from 0 to 1,000.
SOURCE: Organization for Economic Cooperation and Development (OECD), Program for International Student Assessment (PISA), 2015. (This table was prepared January 2017.)

Table 22.1. Percentage of 16- to 19-year-olds who were not assessed in the problem solving in technology-rich environments domain and percentage distribution of those who were assessed, by proficiency level, selected U.S. and international respondent characteristics, and country or subnational region: 2012, 2014, and 2015

[Standard errors appear in parentheses]

U.S. or international respondent characteristic and country or subnational region[1]	Percent of 16- to 19-year-olds not assessed in problem solving in technology-rich environments[2]		Percentage distribution of those who were assessed,[3] by level of proficiency on the problem solving in technology-rich environments scale[4]							
			Below level 1		Level 1		Level 2		Level 3	
1	2		3		4		5		6	
United States[5]										
U.S. total	**7.4**	**(0.95)**	**18.5**	**(2.66)**	**46.7**	**(3.59)**	**31.0**	**(2.99)**	**3.8 !**	**(1.32)**
Sex										
Male	10.8	(1.54)	19.5	(3.58)	44.8	(4.04)	31.9	(3.43)	3.8 !	(1.78)
Female	3.2	(0.96)	17.3	(3.31)	48.8	(5.23)	30.1	(4.46)	3.8 !	(1.74)
Race/ethnicity										
White	6.5	(1.32)	11.9	(2.55)	42.9	(3.85)	39.3	(3.99)	5.9 !	(2.21)
Black	10.0	(2.59)	31.7	(8.96)	57.2	(9.17)	11.0 !	(4.87)	‡	(†)
Hispanic	9.4	(2.51)	26.9	(5.98)	48.7	(7.25)	23.8	(5.64)	‡	(†)
Asian/Pacific Islander	7.7	(3.94)	‡	(†)	47.7 !	(15.17)	30.4 !	(13.27)	‡	(†)
Other[6]	3.3	(2.05)	16.2 !	(7.03)	52.3	(14.54)	26.5 !	(12.58)	‡	(†)
Highest level of parental education										
Neither parent attained high school degree	14.1	(3.01)	22.8 !	(9.45)	56.0	(9.78)	21.2 !	(7.96)	‡	(†)
At least one parent attained high school degree	8.0	(1.90)	23.6	(3.50)	48.9	(5.46)	25.4	(3.89)	‡	(†)
At least one parent attained college degree	5.4	(1.31)	12.6	(3.35)	41.6	(4.45)	39.5	(4.66)	6.3 !	(2.67)
OECD average[7,8]										
Total	**9.0**	**(0.32)**	**12.4**	**(0.50)**	**40.2**	**(0.78)**	**40.9**	**(0.74)**	**6.5**	**(0.37)**
Sex										
Male	10.0	(0.44)	12.3	(0.67)	39.2	(1.04)	41.4	(1.01)	7.1	(0.54)
Female	7.9	(0.44)	12.4	(0.66)	41.3	(1.06)	40.5	(1.01)	5.8	(0.48)
Highest level of parental education										
Neither parent attained high school degree	16.3	(1.33)	26.6	(2.70)	48.2	(3.25)	23.2	(2.45)	‡	(†)
At least one parent attained high school degree	8.6	(0.54)	13.3	(0.74)	44.7	(1.18)	37.5	(1.09)	4.5	(0.47)
At least one parent attained college degree	6.2	(0.58)	6.0	(0.66)	34.0	(1.32)	50.3	(1.37)	9.8	(0.73)
Individual OECD countries[8]										
Austria	6.0	(1.28)	9.2	(2.11)	42.9	(3.60)	41.6	(3.36)	6.2	(1.71)
Canada	6.7	(0.87)	9.4	(1.21)	36.8	(2.79)	44.5	(2.56)	9.3	(1.57)
Chile[9]	9.5	(1.85)	30.3	(4.36)	43.2	(4.56)	24.3	(5.50)	2.2 !	(1.06)
Czech Republic	5.0	(1.28)	8.4	(2.12)	34.6	(4.80)	47.0	(4.17)	10.0 !	(3.39)
Denmark	7.1	(1.19)	8.7	(1.81)	42.2	(2.97)	44.5	(2.95)	4.6	(1.31)
England (UK)	5.2	(1.35)	9.0	(2.60)	50.8	(4.88)	35.6	(4.50)	4.5 !	(2.01)
Estonia	4.4	(1.00)	9.2	(1.53)	41.0	(3.57)	43.6	(3.02)	6.2	(1.31)
Finland	4.6	(1.02)	4.1	(1.22)	36.1	(2.98)	52.0	(3.11)	7.8	(2.02)
Flanders (Belgium)	2.5	(0.84)	8.3	(1.84)	34.4	(3.39)	49.0	(3.52)	8.3	(2.05)
Germany	3.0	(0.80)	9.9	(1.83)	36.8	(2.88)	44.0	(3.21)	9.3	(2.11)
Greece[9]	12.0	(2.69)	32.7	(5.24)	45.9	(6.28)	20.1	(4.75)	‡	(†)
Ireland	10.7	(1.91)	11.9	(2.84)	45.6	(4.57)	37.3	(4.50)	5.2 !	(2.06)
Israel[9]	20.6	(1.75)	19.2	(2.43)	39.5	(2.58)	33.6	(2.90)	7.6	(1.83)
Japan	26.4	(2.87)	6.9 !	(2.08)	34.8	(4.44)	46.6	(4.79)	11.7	(2.47)
Korea, Republic of	4.8	(0.95)	1.9 !	(0.81)	31.6	(3.33)	58.8	(3.15)	7.8	(2.11)
Netherlands	4.9	(1.07)	7.1	(1.86)	35.5	(3.03)	47.8	(2.97)	9.6	(1.88)
New Zealand[9]	4.7	(1.01)	7.6	(1.85)	32.7	(3.24)	46.5	(3.13)	13.2	(1.97)
Northern Ireland (UK)	3.7	(1.41)	9.7	(2.85)	49.6	(5.60)	37.7	(5.00)	‡	(†)
Norway	4.9	(1.04)	9.1	(1.68)	39.0	(2.91)	47.0	(2.92)	4.8	(1.43)
Poland	17.8	(1.54)	12.3	(1.78)	38.2	(2.66)	40.0	(3.57)	9.5	(2.21)
Slovak Republic	12.4	(1.48)	7.9	(1.66)	44.9	(3.73)	43.0	(3.56)	4.1 !	(1.84)
Slovenia[9]	2.2	(0.66)	11.7	(2.18)	41.3	(3.12)	43.1	(2.92)	3.9 !	(1.69)
Sweden	5.0	(1.33)	9.2	(2.01)	33.3	(3.36)	51.0	(3.99)	6.5	(1.60)
Turkey[9]	34.1	(3.71)	36.6	(4.31)	48.6	(5.04)	13.6	(3.10)	‡	(†)
Non-OECD participants										
Lithuania[9]	3.6	(1.41)	24.39	(3.40)	45.1	(4.34)	29.0	(4.90)	‡	(†)
Russian Federation[10]	8.5	(1.74)	17.7	(4.43)	41.6	(5.01)	30.1	(4.59)	10.6 !	(3.57)
Singapore[9]	6.0	(0.95)	7.0	(1.66)	27.2	(2.79)	51.5	(3.25)	14.3	(2.28)

†Not applicable.
!Interpret data with caution. The coefficient of variation (CV) for this estimate is between 30 and 50 percent.
‡Reporting standards not met. Either there are too few cases for a reliable estimate or the coefficient of variation (CV) is 50 percent or greater.
[1]Most entities participating in the Program for the International Assessment of Adult Competencies (PIAAC) survey are countries, but a few of them are subnational regions. Following the name of each subnational region, its country is indicated in parentheses. For example, England and Northern Ireland are both part of the United Kingdom (UK).
[2]Items on the problem solving in technology-rich environments domain were offered only on computer. This column shows the percentages of 16- to 19-year-old respondents who were not assessed in this domain because they were unable to or elected not to take a computer-based assessment.
[3]For each country/region, percentages are based on only those 16- to 19-year-old respondents who were assessed in the domain of problem solving in technology-rich environments, which is defined as "using digital technology, communication tools, and networks to acquire and evaluate information, communicate with others, and perform practical tasks."
[4]The proficiency levels correspond to the following score ranges on a scale of 0 to 500: below level 1 (0-240.9), level 1 (241.0-290.9), level 2 (291.0-340.9), and level 3 (341.0-500.0). Tasks at a higher level are more demanding in terms of requirements such as using specific as well as generic technology applications, using multiple functions and navigation, performing a greater number of steps, generating subgoals, evaluating information, and applying higher level forms of reasoning. For detailed descriptions of each proficiency level, as well as specific examples of tasks at each level, see appendix B of the report *Skills of U.S. Unemployed, Young, and Older Adults in Sharper Focus* (NCES 2016-039rev), available at http://nces.ed.gov/pubs2016/2016039rev.pdf.
[5]Results for the United States are based on combined data from 2012 and 2014.
[6]Includes persons of all other races and those of Two or more races.
[7]Refers to the mean of the data values for all reporting Organization for Economic Cooperation and Development (OECD) countries and subnational regions, to which each country or subnational region reporting data contributes equally. The average in this table includes the United States and all other OECD countries/regions that assessed problem solving in technology-rich environments.
[8]France, Italy, and Spain are omitted from this table because these OECD countries did not assess problem solving in technology-rich environments.
[9]Data are from 2015. Except where otherwise noted, data for other countries/regions are from 2012.
[10]The Russian Federation does not include the population of the Moscow municipal region.
NOTE: Unless otherwise noted, all countries' and subnational regions' data are from 2012. Race categories exclude persons of Hispanic ethnicity. Detail may not sum to totals because of rounding.
SOURCE: U.S. Department of Education, National Center for Education Statistics, Program for the International Assessment of Adult Competencies (PIAAC), U.S. PIAAC 2012/2014; Organization for Economic Cooperation and Development (OECD), PIAAC 2012 and 2015. (This table was prepared October 2016.)

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