



# Certification Status and Experience of U.S. Public School Teachers

Variations Across Student Subgroups



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## EXECUTIVE SUMMARY

This report provides a snapshot of the extent to which U.S. public school students are taught by certified and experienced teachers. The report uses two datasets available to the National Center for Education Statistics (NCES): the Schools and Staffing Survey (SASS) and the National Assessment of Educational Progress (NAEP). SASS provides a comprehensive picture, as it includes teachers of K–12 students in all subjects. NAEP provides a picture specific to grades 4 and 8. In addition, NAEP data are directly related to teachers of two key subjects: reading and mathematics. SASS data are available for the 2011–12 school year and NAEP data are available for 2013 and 2015.

The report presents the percentage of U.S. public school students who are taught by teachers with state certification, by teachers with more than 5 years of experience, and by teachers with a postsecondary degree in the subject in which they teach by various school and student characteristics. Taken together, the information from SASS and NAEP illustrates that access to teachers with certification and other qualifications varies among students in different demographic groups, in different school settings, and in different states and large urban school districts.

### CERTIFICATION

At least 90 percent of the nation's public school students, at the primary and secondary levels, were taught by teachers with state certification in the years studied: 2011–12, 2013, and 2015. However, the percentage differed by various school and student characteristics and across various jurisdictions.

### YEARS OF EXPERIENCE

At least 75 percent of students had a teacher with more than 5 years of experience in the 2011–12 school year and in 2015. As with teacher certification, the percentage differed by various school and student characteristics and across various jurisdictions.

## Grades K–12:

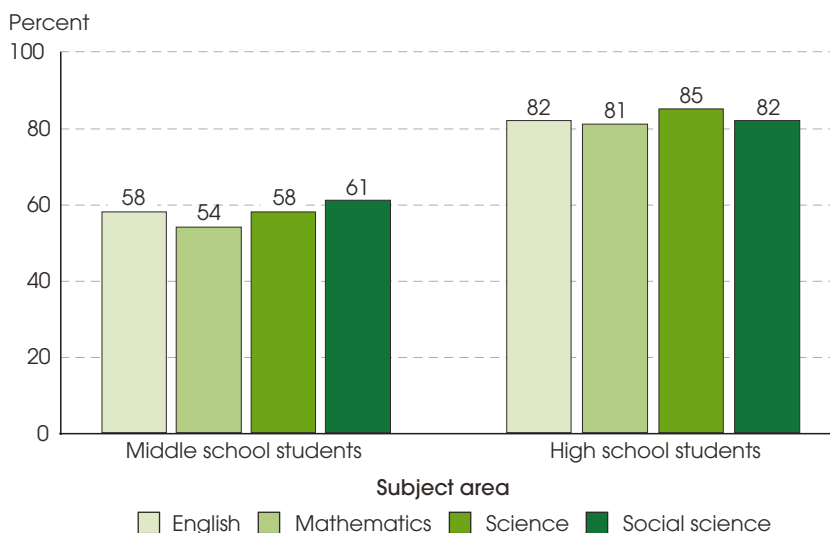
94 percent of public school students were taught by a certified teacher in 2011–12

Based on the SASS data, the percentage of students taught by a state-certified teacher<sup>1</sup> in the 2011–12 school year was about 94 or 95 percent in each of the four school locale categories (i.e., city, suburb, town, and rural) and between 89 and 99 percent in each of the states with reportable data.

In the 2011–12 school year, the percentage of public school students taught by a certified teacher did not vary by students' disability status, English language learner status, or grade level (i.e., primary, middle, and high school).

However, differences existed between the percentages of middle grade and high school students who were taught by a teacher certified in their specific subject area. Specifically, a larger percentage of high school students than middle school students were taught by a teacher certified in the subject area in which they were teaching for English, mathematics, science, and social science classes (see figure ES-1).

**FIGURE ES-1.** Percentage of public school students in departmentalized classes taught by a teacher certified in a specific subject area, by student grade level: 2011–12



NOTE: Middle school includes any classes taught to students in any of grades 6–8. High school includes classes taught to students in any of grades 9–12. A certification is credited if it is a regular or standard state certificate or a probationary in-subject certification and in any of grades 6–8 (for middle school) or at the secondary level (for high school).

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, Schools and Staffing Survey (SASS), "Public School Teacher Data File," 2011–12.

<sup>1</sup> For SASS, teachers are counted as certified if they reported having a "regular or standard state certificate or advanced professional certificate" or "certificate issued after satisfying all requirements except the completion of a probationary period."

## Grades 4 and 8 Mathematics:

At least 90 percent of public school students in 2013 and in 2015 were taught by a certified teacher

Based on the NAEP data, nationally, 92 percent of 4th-graders and 90 percent of 8th-graders in 2015 were taught by a state-certified mathematics teacher.<sup>2</sup> The percentages were 93 percent and 92 percent for grades 4 and 8, respectively, in 2013. However, in each grade, the percentages differed across states and urban school districts, and by various school and student characteristics.<sup>3</sup>

In 2015, the percentage of students who had a mathematics teacher with state certification ranged from 61 percent in Ohio to almost 100 percent in Alabama in 4th grade and from 59 percent in the District of Columbia to 99 percent in Nebraska in 8th grade.

In the 21 urban school districts participating in the NAEP Trial Urban District Assessment (the **TUDA districts**), the percentage of students who were taught by a state-certified teacher ranged from 67 to 97 percent in 4th grade and from 68 to 99 percent in 8th grade in 2015.

Among the various school characteristics, for both grades 4 and 8, the percentage of students who had a mathematics teacher with state certification was lower for students in schools in **cities** than for students in suburban schools and lower for students in schools with **high-minority enrollment** than for students in schools with lower minority enrollment. Furthermore, at grade 4, the percentage was lower for students in schools in cities than in rural schools (see table ES-1).

Among the student characteristics, for both grades 4 and 8, the percentage of students who had a mathematics teacher with state certification was lower for students eligible for the **National School Lunch Program (NSLP)** than for noneligible students and lower for **Black students** than for White students. Furthermore, at grade 8, the percentage was lower for **Hispanic students** than for White students (see table ES-1).

**TABLE ES-1.** Percentage of 4th- and 8th-grade public school students who had a mathematics teacher with state certification, by selected school and student characteristics: 2015

4th grade				
City:	90%	<	Suburban:	93%
City:	90%	<	Rural:	92%
Rural:	92%		Suburban:	93%
High-minority enrollment:	90%	<	Lower minority enrollment:	93%
SD:	92%		Non-SD:	92%
ELL:	91%		Non-ELL:	92%
NSLP:	91%	<	Non-NSLP:	93%
Black:	90%	<	White:	92%
Hispanic:	92%		White:	92%
8th grade				
City:	88%	<	Suburban:	91%
City:	88%		Rural:	89%
Rural:	89%		Suburban:	91%
High-minority enrollment:	84%	<	Lower minority enrollment:	92%
SD:	89%		Non-SD:	90%
ELL:	88%		Non-ELL:	90%
NSLP:	88%	<	Non-NSLP:	92%
Black:	86%	<	White:	91%
Hispanic:	88%	<	White:	91%

< Indicates a statistically significant difference.  
NOTE: High-minority enrollment = schools with minority enrollment of 75 percent or higher. Minority includes the following reporting categories: Black, Hispanic, Asian, American Indian/Alaska Native, Native Hawaiian/Other Pacific Islander, and Two or more races. SD = students with disabilities; ELL = English language learners; NSLP = eligible for National School Lunch Program. Race/ethnicity based on school records. Race categories exclude persons of Hispanic ethnicity.  
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2015 Mathematics Assessment.

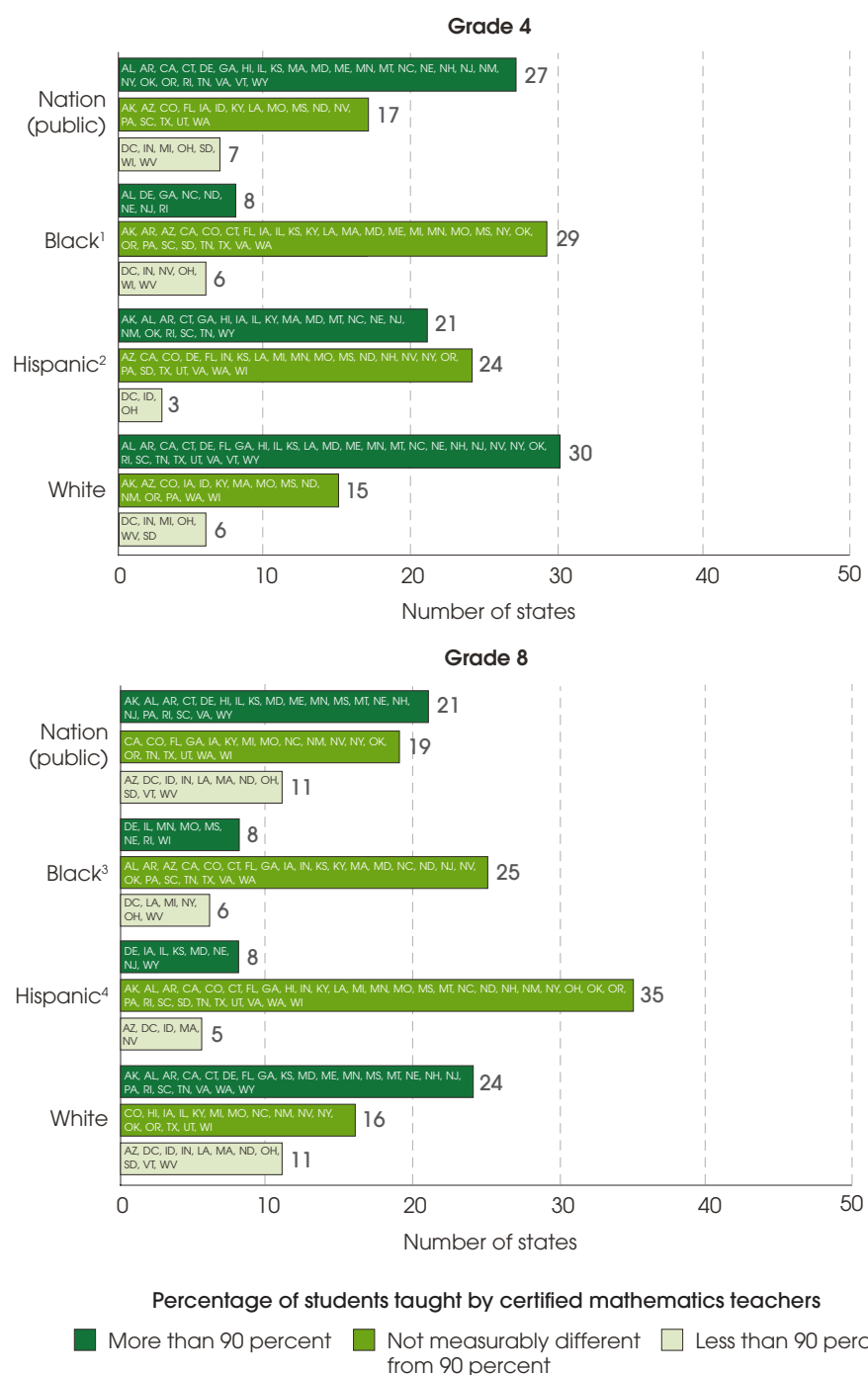
<sup>2</sup> For NAEP, teachers are counted as state certified if they responded “Yes, I hold a permanent certificate” to the question “Do you hold a regular or standard certificate that is valid in the state in which you are currently teaching?” Other response options were “Yes, I hold a temporary certificate. (This type of certificate may require additional coursework, student teaching, etc.),” “No, but I am currently working toward certification,” and “No, and I am not planning to obtain certification.”

<sup>3</sup> Selected large urban schools districts participate in the NAEP assessments. These large urban districts are referred to as the Trial Urban District Assessment districts, or TUDA districts. See the Technical Notes, table TN-2, for a full listing of the 2013 and 2015 participating TUDA districts and their states.



In 2015, there were 27 states in grade 4 and 21 states in grade 8 where the percentage of students who had a mathematics teacher with state certification was higher than 90 percent (the lowest percentage across the two grades for the nation). Differences were found by student race and ethnicity. At grade 4, the percentage of students who had a mathematics teacher with state certification was higher than 90 percent in eight states for Black students, in 21 states for Hispanic students, and in 30 states for White students. Similarly, at grade 8, this percentage was higher than 90 percent in eight states for Black students, eight states for Hispanic students, and in 24 states for White students (see figure ES-2).

**FIGURE ES-2.** Percentage of 4th-grade and 8th-grade public school students who had a mathematics teacher with state certification, by state and selected race/ethnicity: 2015



<sup>1</sup> HI, ID, MT, NH, NM, UT, VT, and WY did not meet reporting standards.

<sup>2</sup> ME, VT, and WV did not meet reporting standards.

<sup>3</sup> AK, HI, ID, ME, MT, NH, NM, OR, SD, UT, VT, and WY did not meet reporting standards.

<sup>4</sup> ME, VT, and WV did not meet reporting standards.

NOTE: Ninety percent was chosen as a reference point because at least 90 percent of the nation's public school students in both grades 4 and 8 were taught by a mathematics teacher with state certification in 2015. Race/ethnicity based on school records. Race categories exclude persons of Hispanic ethnicity.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2015 Mathematics Assessment.



## Grades K–12:

80 percent of public school students in 2011–12 had a teacher with more than 5 years of experience

According to the SASS data, a larger percentage of primary school students (82 percent) than high school students (79 percent) had a teacher with more than 5 years of experience in the 2011–12 school year.

## Grades 4 and 8 Mathematics:

About 75 percent of public school students in 2015 had a teacher with more than 5 years of experience

Based on the NAEP data, about 76 percent of 4th-graders and about 75 percent of 8th-graders had a mathematics teacher with more than 5 years of experience in 2015. However, these percentages differed among states, large cities, and urban school districts and by various school and student characteristics.

In 2015, the percentage of students who had a mathematics teacher with more than 5 years of experience ranged from 54 percent in the District of Columbia to 87 percent in Rhode Island in 4th grade and from 50 percent in the District of Columbia to 89 percent in Alaska and Maine in 8th grade.

Among the participating **TUDA districts** in 2015, the percentage of students who had a mathematics teacher with more than 5 years of experience ranged from 60 percent to 95 percent in 4th grade and from 50 percent to 98 percent in 8th grade.

Among the various school characteristics, for both grades 4 and 8, the percentage of students who had a mathematics teacher with more than 5 years of experience was lower for students in schools in **cities** than for students in suburban and rural schools and lower for students enrolled in **high-minority schools** than for students enrolled in lower minority schools (see table ES-2).

Among the student characteristics, for both grades 4 and 8, the percentage of students who had a mathematics teacher with more than 5 years of experience was lower for **NSLP-eligible students** than for noneligible students, lower for **Black students** than for White students, and lower for **Hispanic students** than for White students. Furthermore, for grade 8, the percentage was lower for ELL students than for non-ELL students.

**TABLE ES-2.** Percentage of 4th- and 8th-grade public school students who had a mathematics teacher with more than 5 years of experience, by selected school and student characteristics: 2015

4th grade				
City:	73%	<	Suburban:	78%
City:	73%	<	Rural:	78%
Rural:	78%		Suburban:	78%
High-minority enrollment:	72%	<	Lower minority enrollment:	78%
SD:	76%		Non-SD:	76%
ELL:	74%		Non-ELL:	77%
NSLP:	74%	<	Non-NSLP:	79%
Black:	71%	<	White:	78%
Hispanic:	75%	<	White:	78%
8th grade				
City:	72%	<	Suburban:	77%
City:	72%	<	Rural:	76%
Rural:	76%		Suburban:	77%
High-minority enrollment:	69%	<	Lower minority enrollment:	77%
SD:	74%		Non-SD:	75%
ELL:	71%	<	Non-ELL:	76%
NSLP:	73%	<	Non-NSLP:	78%
Black:	70%	<	White:	78%
Hispanic:	72%	<	White:	78%

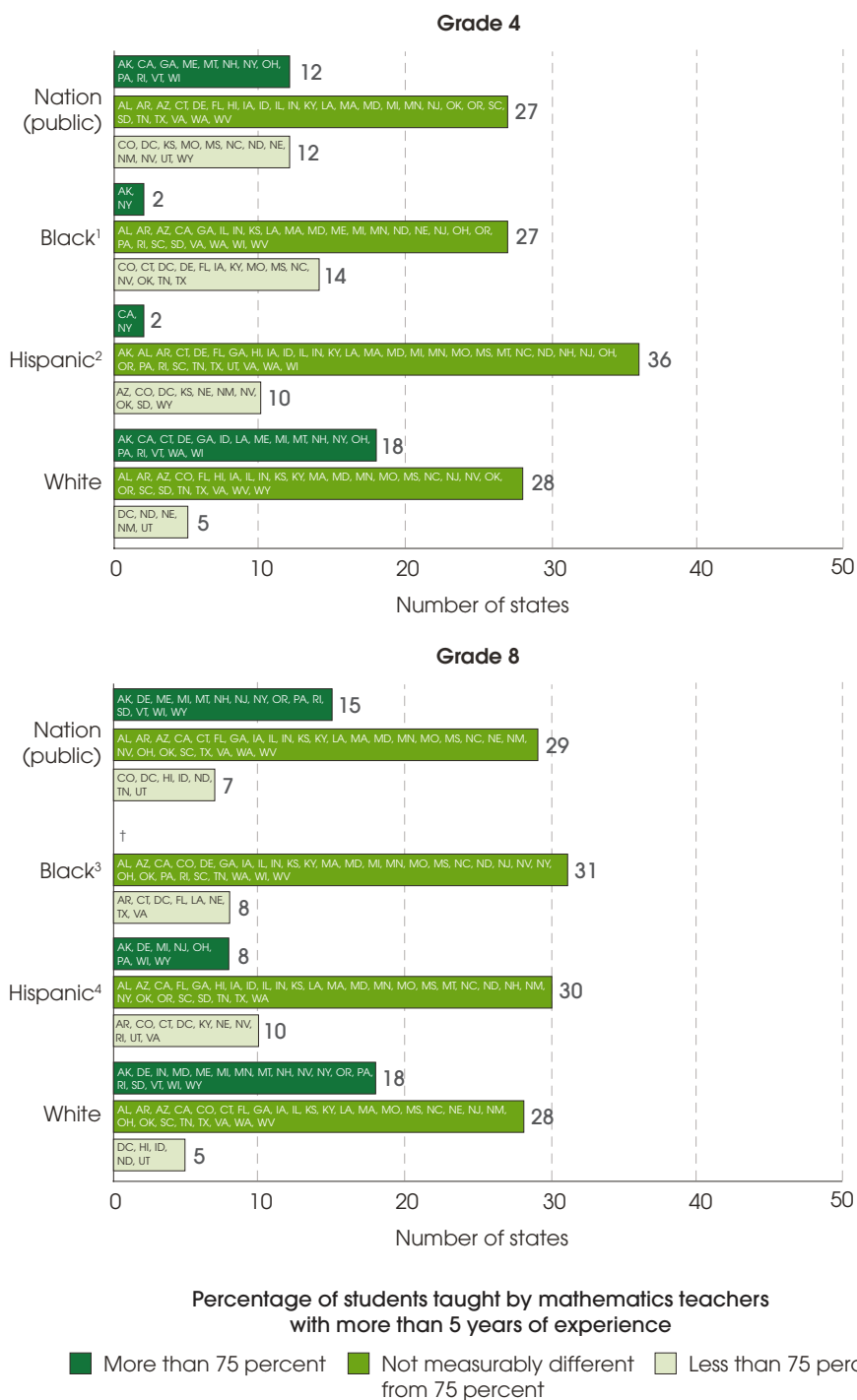
< Indicates a statistically significant difference.

NOTE: High-minority enrollment = schools with minority enrollment of 75 percent or higher. Minority includes the following reporting categories: Black, Hispanic, Asian, American Indian/Alaska Native, Native Hawaiian/Other Pacific Islander, and Two or more races. SD = students with disabilities; ELL = English language learners; NSLP = eligible for National School Lunch Program. Race/ethnicity based on school records. Race categories exclude persons of Hispanic ethnicity.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2015 Mathematics Assessment.

In 2015, there were 12 states in grade 4 and 15 states in grade 8 where the percentage of students who had a mathematics teacher with more than 5 years of experience was higher than 75 percent (the lowest percentage across the two grades for the nation). Differences were found by student race and ethnicity. At grade 4, the percentage of students who had a mathematics teacher with more than 5 years of experience was higher than 75 percent in two states for Black and Hispanic students and in 18 states for White students. Similarly, at grade 8, this percentage was higher than 75 percent in no states for Black students, eight states for Hispanic students, and in 18 states for White students (see figure ES-3).

**FIGURE ES-3.** Percentage of 4th-grade and 8th-grade public school students who had a mathematics teacher with more than 5 years of experience, by state and selected race/ethnicity: 2015



† Not applicable. There are no states that correspond to this category.

<sup>1</sup> HI, ID, MT, NH, NM, UT, VT, and WY did not meet reporting standards.

<sup>2</sup> ME, VT, and WV did not meet reporting standards.

<sup>3</sup> AK, HI, ID, ME, MT, NH, NM, OR, SD, UT, VT, and WY did not meet reporting standards.

<sup>4</sup> ME, VT, and WV did not meet reporting standards.

NOTE: Seventy-five percent was chosen as a reference point because at least 75 percent of the nation's public school students in both grades 4 and 8 were taught by a mathematics teacher with more than 5 years of experience in 2015. Race/ethnicity based on school records. Race categories exclude persons of Hispanic ethnicity.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2015 Mathematics Assessment.

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*List of Appendix B tables starts on page B-1.*

# CHAPTER 1. Introduction

This special report from the National Center for Education Statistics (NCES) provides information about the extent to which students attending U.S. K–12 public schools are taught by teachers with state-conferred teaching certification. It was prepared to address a request by the Committees on Appropriations of the U.S. House of Representatives and the U.S. Senate; the Committee on Education and the Workforce of the U.S. House of Representatives; and the Committee on Health, Education, Labor and Pensions of the U.S. Senate. Their request was to provide

... data from the most recent school year by State and each local educational agency, regarding the extent at the school-level to which students in the following categories are taught by teachers who have not yet obtained full State certification: students with disabilities, English Learners, students in rural areas, students from low-income families, and minority students (H.R. 3020 2016, p. 77).

In addition to the data on teachers with state certification, the report includes data on other teacher qualifications, such as years of experience and field of postsecondary education, to provide additional context.

The report utilizes data on teachers with state certification from two NCES data collections: the National Assessment of Educational Progress

(NAEP) and the Schools and Staffing Survey (SASS). The data from these collections can be used to provide information on the percentages of U.S. public school students who are taught by teachers with state certification and to provide evidence about whether these percentages differ by student characteristics, school characteristics, and school location.

Teacher credentials (e.g., certification status) and experience are the most widely used indicators of teachers' individual inputs to the workforce (Goldhaber, Lavery, and Theobald 2015).

However, the literature does not suggest a strong association between these indicators and student achievement, perhaps due to the complexity of the relationships among other teacher attributes, student and school characteristics, and student achievement (Darling-Hammond 2000; Goldhaber 2015; Goldhaber, Lavery, and Theobald 2015; Harris and Sass 2011; Wayne and Youngs 2003). Accordingly, recent studies have tended to include other indicators—such as teacher licensure exam scores and estimates of teacher effectiveness from value-added models—which indeed seem to be more closely related to student achievement gains (Goldhaber 2015; Goldhaber, Lavery, and Theobald 2015). Yet at the national level, these indicators can be problematic because teacher licensure exams vary substantially by state, and value-added models can produce varying results depending on the conceptual framework on which they are based.



Focusing on schools with high-poverty and high-minority student populations, the research consistently shows that these schools tend to have teachers with temporary certification, with fewer years of teaching experience, and who teach in fields in which they are not necessarily certified (Clotfelter et al. 2006; Darling-Hammond 2002; Hanushek, Kain, and Rivkin 2004; Imazeki and Goe 2009; Rice 2013). In addition, highly qualified teachers—that is, teachers who scored well on their knowledge certification exams and completed all of the requirements for full certification—are more likely to transfer from or quit lower achieving schools than higher achieving schools (e.g., Boyd et al. 2005). Moreover, newly hired teachers are more likely to start their career at a school in a city or in a rural area with more minority students and more students eligible for the National School Lunch Program (NSLP), an indicator of poverty, than in a school in a suburban area with fewer minority students and fewer students eligible for the NSLP (Gagnon and Mattingly 2012; Goe 2002). A study of 26 school districts found similar patterns of teacher hiring, transfers, and attrition (Isenberg et al. 2016). However, except in a small number of study districts, these patterns of teacher hiring and transfers contributed only to small differences between high- and low-income students in terms of their access to effective teachers. Regarding the pattern of teacher attrition, the difference was not statistically significant.

Clotfelter, Ladd, and Vigdor (2010) studied high school students in North Carolina and found that students in higher poverty schools had less qualified teachers—as measured by years of experience and educational background, licensure test scores, and type of licensure—than those in lower poverty schools. With the value-added estimates incorporated, Goldhaber, Lavery, and Theobald (2015) also found that economically disadvantaged students, underrepresented minority students, and students with low prior

academic performance in Washington State were less likely to be assigned to highly qualified teachers at various grade levels.

This report focuses on teachers' certification status, years of experience, and postsecondary education, emphasizing that they are important in developing an understanding of the status of U.S. public teachers at the national and state levels, but that they are nonetheless only part of the larger context that conceptualizes teacher quality.

## DATA SOURCES

This report uses data from two national data collections—SASS and NAEP—sponsored and implemented by NCES. SASS provides information on teachers of students in all of grades K–12; however, SASS is limited in terms of the recency of its data, as its last data collection was in the 2011–12 school year. NAEP provides data from 2013 and 2015, but its data are specific to teachers of students at grades 4 and 8. NAEP data are directly related to teachers of two key subjects: reading and mathematics. An overview of each collection is provided next. More detailed information related to sampling, methodology, and definitions is provided in the **Technical Notes**.

## SCHOOLS AND STAFFING SURVEY

SASS collects information that can be used to provide a detailed picture of U.S. elementary and secondary schools and their staff. This information is collected through the following surveys: district, school, principal, teacher, and library media center. SASS is a national and state-level representative sample survey of public (including traditional public and charter schools) and private K–12 schools in the 50 states and the District of Columbia. This report presents results for public school students from the 2011–12 school year, the last time SASS was conducted.

The 2011–12 SASS used a school-based sample of public schools. The school sample was drawn to support estimates on a wide range of topics by public school characteristics such as grade level and community type. Teachers associated with a selected school were sampled from a teacher list provided by the school or district. The data collected from public school teachers included class organization, subject taught, grade level taught, and number of students taught. Teachers also provided the counts of their students with an Individualized Education Program (IEP) because they have disabilities or are special education students and the counts of English language learners (ELL). Data were also collected about teachers' education and state teaching certification.

## NATIONAL ASSESSMENT OF EDUCATIONAL PROGRESS

NAEP is an assessment program conducted by NCES to inform the public of what elementary and secondary students in the United States know and can do in various subject areas, including mathematics and reading. The NAEP reading and mathematics assessments at grades 4 and 8 are congressionally mandated to be conducted biannually. All 50 states and the District of Columbia, as well as selected large urban schools districts, participate in these assessments. These large urban districts are referred to as the Trial Urban District Assessment districts, or TUDA districts, throughout this report.<sup>1</sup> The National Assessment Governing Board oversees and sets policy for the NAEP program. Results from 2015 and 2013, the two

most recent NAEP data collection years, are provided for both grades 4 and 8. Comparisons are provided within each grade. No comparisons are made either between years within a grade or between grades.

Results from NAEP are based on nationally representative samples of students. Schools are selected to participate in NAEP, and students at the target grade level are randomly selected from these schools. The “subject teacher” of each selected student at grades 4 and 8 (i.e., the teacher of the subject in which the student is assessed in NAEP) is asked to complete a questionnaire that asks for information regarding permanent state certification, years of experience, and educational background. Since the teachers are linked with the sample of students, NAEP can provide information on the percentage of students who have subject teachers with certain characteristics.

For comparisons between SASS and NAEP on their purpose, sampling, data collection window, collection of information at the state and district levels, and collection of student information, see exhibit 1.

## INTERPRETING RESULTS

Using estimates calculated from data based on a sample of the population requires consideration of several factors before the estimates become meaningful. Data from samples can provide only an approximation of the true or actual value. The range of estimates of the true value 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 variation is called the “standard error” of an estimate.

<sup>1</sup> The District of Columbia participates in NAEP as both a state and a TUDA district, and the results differ due to the treatment of public charter schools. When the District of Columbia is reported as a state, public charter schools are included in the results. When it is reported as a TUDA district, public charter schools are not included in the results. See the Technical Notes, table TN-2, for a full listing of the 2013 and 2015 participating TUDA districts and their states.

**EXHIBIT 1.** Selected components of the NCES Schools and Staffing Survey and the National Assessment of Educational Progress

Survey component	SASS	NAEP
Survey purpose	Surveys background and qualifications of teachers	Assesses subject-specific knowledge and skills of students and links students' performance with teacher qualifications
Sampling	Teachers from selected K–12 schools	Students from grades 4, 8, and 12 in selected schools
Data collection window	September to June. Every 4 even school years	January through March. Odd years for reading and mathematics
State and school district	All 50 states and the District of Columbia are included in the universe of schools; the first stage of SASS sampling involves the selection of schools	Mandatory for all 50 states to participate in biannual grade 4 and 8 reading and mathematics assessments; some selected large urban school districts volunteer to participate
Student demographic information	Teachers provide a count of students they teach, a count of students with disabilities, and a count of English language learners	Collected directly from the school. Demographics include gender, race/ethnicity, disability and English language learner status, and eligibility for the National School Lunch Program

Note that all differences calculated in this report are based on unrounded estimates. In this report, differences between estimates are provided only when they are statistically significant in order to ensure that they are larger than might be expected due to sampling variation. To determine whether the differences reported are statistically significant, *t* tests at the .05 level of significance were performed. Differences identified in this report as *higher*, *lower*, *larger*, or *smaller* meet the requirements for statistical significance. Although one estimate may appear to be larger than another, a statistical test for significance may find that the apparent difference between them is not significant due to the amount of 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. No adjustments were made for multiple comparisons.

The data presented in this report were taken from two different data sources in order to provide a picture of teacher certification and other teacher quality indicators in grades K–12 as well as in two specific grades (4 and 8). However, the results should not be directly compared across data sources as there are differences in the populations studied, study designs, and reference periods, as shown above in exhibit 1. More information on these two data sources can be found in the **Technical Notes** of this report.

The data in this report cannot be used to investigate more complex hypotheses or support causal inferences. Readers who are interested in more complex relationships and in-depth analysis are encouraged to explore other NCES resources, including publications, online data tools, and public- and restricted-use datasets at <http://nces.ed.gov>.

## ORGANIZATION OF THIS REPORT

This report presents detailed results from SASS and from NAEP for two research questions. Chapter 2 examines the extent to which U.S. public school students are taught by certified teachers. It shows results from the 2011–12 SASS for grades K–12 and from the 2013 and 2015 NAEP for grade 4 (mathematics) and grade 8 (mathematics and reading). Chapter 3 examines the extent to which U.S. public school students are taught by teachers who have more than 5 years of teaching experience. Again, results are presented first from the 2011–12 SASS for grades K–12 and then from the 2015 NAEP for grade 4 (mathematics) and grade 8 (mathematics and reading). Chapter 3 also provides information from the 2015 NAEP mathematics and reading assessments for grade 8 on whether teachers had a major or minor in a mathematics field (for students assessed in mathematics) or a reading field (for students assessed in reading) during their postsecondary studies.

For both chapters, results are presented in two major segments. “Results across student subgroups” include results for students at the national, school locale (i.e., city, suburb, town, and rural), state, and large urban school district (i.e., TUDA district) levels, where available. “Results by student subgroups” include results for students by race/ethnicity, for students with disabilities (SD), for English language learners (ELL), and for students eligible for the National School Lunch Program (NSLP), where available.

The Technical Notes provide detailed information on the survey questions, definitions of categories, and sampling and methodology for each data collection. Tables of estimates and their associated standard errors can be found in the appendices. Appendix A includes data tables related to the results found in chapter 2, and appendix B has data tables related to the results found in chapter 3.

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## CHAPTER 2. To What Extent Are Students Taught by Certified Teachers?

State teaching certification is often used as a measure of teacher quality. The requirements for certification and licensing vary by state, and these requirements can include a test of basic skills, a subject knowledge exam, a subject-specific pedagogy exam, and an assessment of teaching performance. In addition, not all states have the same set of requirements for teachers in charter schools, and 15 states and the District of Columbia do not require teachers in charter schools to have any certification (NCES 2016).

This chapter examines the following question:

**What percentage of public school students have a teacher with state certification? Does this percentage differ by various student and school characteristics and across various jurisdictions?**

The first section of the chapter focuses on students in K–12 public schools and presents national- and state-level data from the 2011–12 Schools and Staffing Survey (SASS). The next section focuses on students in grades 4 and 8 and presents data for the nation, states, large cities, and TUDA districts from the 2013 and 2015 National Assessment of Educational Progress (NAEP). Where possible, results are presented across student subgroups for the nation and by selected subgroups. Student subgroups include students with disabilities, English language learners, and students eligible for the National School Lunch Program.

### K–12: RESULTS FROM THE SCHOOLS AND STAFFING SURVEY

One purpose of SASS was to provide national- and state-level data about public school teachers. The data collected from public school teachers covered class organization, subject taught, grade level taught, and number of students taught. Data were also collected about teachers' education and state teaching certification. With proper weight adjustments, the data can also be used to study public school student experiences. For more information on SASS and data definitions, see the **Technical Notes**.

Specifically, this section presents information on the extent to which K–12 public school students are taught by teachers who have obtained full state certification by selected student characteristics. It also provides additional context by providing information on in-grade teaching at the primary level and in-field teaching at the middle and high school levels.

The 2011–12 SASS public school teacher survey contained a series of questions about the sampled teacher's state teaching certification, including the type, content area(s), and grade range(s) of the certificate(s). Data were collected for up to two certificates in the state in which the teacher currently teaches using the following question:



“Which of the following describes the teaching certificate you currently hold that certifies you to teach in THIS state?” The response options were as follows:

1. “Regular or standard state certificate or advanced professional certificate;”
2. “Certificate issued after satisfying all requirements except the completion of a probationary period;”
3. “Certificate that requires some additional coursework, student teaching, or passage of a test before regular certification can be obtained;”
4. “Certificate issued to persons who must complete a certification program in order to continue teaching;” and
5. “I do not hold any of the above certifications in THIS state.”

For the SASS results presented in this report, teachers are defined as having full state teaching certification if they selected (1) “regular or standard state certificate or advanced professional certificate” or (2) “certificate issued after satisfying all requirements except the completion of a probationary period.” This definition reflects the fact that some states issue an initial or preliminary license to all fully qualified teachers for an initial period. Thus, references to “certified teachers” or “state-certified teachers” reflect this definition of state teaching certification. All SASS estimates and their standard errors for this section can be found in **appendix A**, tables A-1 through A-5.

## K-12 RESULTS

**Results across student subgroups:** Nationally, among K-12 public school students, 94 percent were taught by teachers with full state certification in the 2011-12 school year (see table 2-1). The percentages did not differ measurably by school locale, with 94 percent of students in city and suburban schools and 95 percent of students

in town and rural schools taught by state-certified teachers (see table A-1).

**TABLE 2-1.** Percentage of K-12 public school students taught by teachers with full state certification, by selected student characteristics and school location 2011-12

	Total	Students with disabilities <sup>1</sup>	English language learners <sup>2</sup>
<b>Total</b>	<b>94.3</b>	<b>93.7</b>	<b>93.2</b>
<b>School location</b>			
City	93.6	92.2	93.9
Suburb	94.5	95.1	92.3
Town	94.9	93.3	93.5
Rural	94.5	93.7	93.0

<sup>1</sup> Based on the 12 percent of K-12 public school students who have an Individualized Education Program (IEP).

<sup>2</sup> Based on the 9 percent of K-12 public school students who are limited English proficient or are English language learners (ELLs). NOTE: Teachers are counted as certified if they reported having a “regular or standard state certificate or advanced professional certificate” or “certificate issued after satisfying all requirements except the completion of a probationary period.”

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, Schools and Staffing Survey (SASS), “Public School Teacher Data File,” 2011-12.

Across the states, the percentage of K-12 students taught by state-certified teachers ranged from 89 percent in Arizona to 99 percent in Iowa and Nebraska.<sup>2</sup> By locale, the percentages ranged from 87 percent in Louisiana and Washington to about 100 percent in Nebraska and West Virginia for city schools; 85 percent in Virginia to about 100 percent in Mississippi and Nebraska for suburban schools; 74 percent in Washington to almost 100 percent in Massachusetts and Wyoming for town schools; and from 88 percent in Pennsylvania to 99 percent in Idaho, Illinois, Iowa, New Jersey, and Nebraska for rural schools (see table A-2).<sup>3</sup>

## Results by student subgroups

**Students with disabilities:** Among students who had an Individualized Education Program (IEP) because they have disabilities or are special

<sup>2</sup> Forty-five of the 50 states and the District of Columbia had data that met reporting standards. Reporting standards were not met when the coefficient of variation (CV) for the estimate was 50 percent or greater (i.e., the standard error was 50 percent or more of the estimate), the response rate for the state was below 50 percent, or there were too few cases for a reliable estimate.

<sup>3</sup> For city, town, and rural school data, 45 states met reporting standards; for suburban schools, 41 states met reporting standards.



education students, 94 percent were taught by state-certified teachers. Across locales, the percentages taught by state-certified teachers were 92 percent for city, 95 percent for suburban, 93 percent for town, and 94 percent for rural schools. Across the states, the percentage of students with an IEP taught by state-certified teachers ranged from 88 percent in Arizona to 99 percent in Iowa and Nebraska (see tables A-1 and A-2).

**English language learners:** Among students who were limited English proficient or were ELL students, about 93 percent were taught by state-certified teachers. The percentages of ELL students taught by state-certified teachers were 94 percent for city, 92 percent for suburban, 93 percent for town, and 93 percent for rural schools. Across the states, the percentage of ELL students taught by state-certified teachers ranged from 73 percent in Montana to about 100 percent in Iowa, Nebraska, and West Virginia (see tables A-1 and A-2).

## IN-GRADE CERTIFICATION

This section presents findings for in-grade certification for all grade levels. The SASS public school teacher survey collected information on the grades that the teacher taught during the 2011-12 school year and the grade level(s) that the state certification allowed the teacher to teach.

Teachers are counted as having certification in grade range if they were certified in “early childhood, preschool, or at least one of grades K-5” for primary school students, were certified in “at least one of grades 6-8” for middle school students, or were certified in “at least one of grades 9-12” for high school students.

**Results across student subgroups:** About 92 percent of all students were taught by teachers with certification in the grade level that they taught (see table 2-2 and table A-3). The

percentage did not vary among the primary, middle, and high school levels.

**TABLE 2-2.** Percentage of public-school students taught by teachers with full state certification, by certification in-grade range status and student grade level: 2011-12

Characteristic	Taught by teachers with full state certification:	
	Certified in grade range	Not certified in grade range
<b>Total</b>	<b>92.3</b>	<b>2.0</b>
<b>Student grade level</b>		
Primary (grades K-5)	91.6	2.6
Middle (grades 6-8)	92.1	2.3
High (grades 9-12)	93.3	0.9

NOTE: Details do not add to totals because the category “Taught by teachers without full state certification” is not shown. Teachers are counted as certified if they reported having a “regular or standard state certificate or advanced professional certificate” or “certificate issued after satisfying all requirements except the completion of a probationary period.” Teachers are counted as having certification in grade range if they were certified in “early childhood, preschool, or at least one of grades K-5” for primary school students, were certified in “at least one of grades 6-8” for middle school students, or were certified in “at least one of grades 9-12” for high school students.  
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, Schools and Staffing Survey (SASS), “Public School Teacher Data File,” 2011-12.

## Results by student subgroups

**Students with disabilities:** Among K-5 students who had an IEP because they had disabilities or were special education students, 93 percent were taught by teachers certified in the grade range, which was not measurably different from the percentage for all students (see table A-4).

**English language learners:** Among K-5 students who were limited English proficient or were ELL students, 92 percent were taught by teachers certified in the grade range, a percentage not measurably different from that for all students (see table A-4).

## IN-FIELD CERTIFICATION

SASS also collected information on the subject taught, the content area(s) that the state certification allowed the teacher to teach, and the teacher’s postsecondary education degree. Teacher qualifications were measured by the correspondence between the major field of the teacher’s degree and the subject(s) taught. Using

**TABLE 2-3.** Percentage distribution of public school students in middle grade and high school departmentalized classes taught by a certified teacher in a specific subject area, by the teacher's certification and major status in selected subject areas: 2011-12

Grade level	English	Mathematics	Science	Social science	General elementary education
<b>Middle school</b>					
Total certified in subject	57.9	54.4	58.1	60.6	64.9
Both certification and major	37.5	23.7	34.3	39.6	53.2
Certification only	20.4	30.7	23.8	20.9	11.7!
Major only	10.2	7.1	11.1	12.1	23.6!
Neither major nor certification	31.9	38.5	30.8	27.4	11.5
<b>High school</b>					
Total certified in subject	81.7	80.8	84.6	82.3	†
Both certification and major	68.6	61.5	72.1	67.6	†
Certification only	13.0	19.3	12.5	14.7	†
Major only	9.9	8.7	6.7	11.3	†
Neither major nor certification	8.5	10.5	8.7!	6.4	†

† Not applicable.

! Interpret data with caution. The standard error is at least 30 percent and less than 50 percent of the estimate.

NOTE: Middle grade includes any classes taught to students in any of grades 6-8. High school includes classes taught to students in any of grades 9-12.

Majors are included regardless of whether they are held within or outside the school/college of education. Majors in main assignment are credited if they are held at the bachelor's degree level or higher. A certification is credited if it is a regular or standard state certificate or a probationary in-subject certification and in any of grades 6-8 (for middle grades) or at the secondary level (for high school). Detail may not sum to totals because of rounding.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, Schools and Staffing Survey (SASS).

"Public School Teacher Data File," 2011-12.

this information, teachers were classified into one of the following categories based on the correspondence of their state certification and major field to the subject matter taught:

(1) both the certification and major were in field, (2) only the certification was in field, (3) only the major was in field, or (4) neither the certification nor the major was in field. Information is only available for students in grades 6-12 and is not available by student subgroups. For more details, see the **Technical Notes**.

At the middle grade level (grades 6-8), 58 percent of students in English, 54 percent in mathematics, 58 percent in science, 61 percent in social science, and 65 percent in general elementary education were taught by a teacher certified in the subject area (see tables 2-3 and

A-5).<sup>4</sup> At the high school level (grades 9-12), 82 percent of students in English, 81 percent in mathematics, 85 percent in science, and 82 percent in social science were taught by a teacher certified in the subject area. In each of these four subjects, a larger percentage of high school students than middle grade students were taught by a teacher certified in the subject area.

Furthermore, the percentage of middle grade students in departmentalized classes taught by teachers with both an in-field certification and major ranged from 24 percent for mathematics to 40 percent for social studies. In addition, 53 percent of middle grade students were taught by teachers with both an in-field certification and major for general elementary education classes. The percentage of middle grade students

<sup>4</sup> While the term "general elementary education" implies that it was not an assignment applicable to middle grade teachers, some teachers who reported this assignment taught students meeting the SASS definition of the middle grades. Of the total general elementary classrooms in grades 5-8, 59 percent were 5th-grade classrooms, 28 percent were 6th-grade classrooms, 6 percent were 7th-grade classrooms, and 7 percent were 8th-grade classrooms.

in departmentalized classes taught by teachers with neither an in-field certification nor an in-field major ranged from 27 percent for social science to 38 percent for mathematics; furthermore, 12 percent of middle grade students in general elementary classes were taught by a teacher with neither an in-field certification nor an in-field major.

The percentage of high school students in departmentalized classes taught by teachers with both an in-field certification and major ranged from 62 percent for mathematics to 72 percent for science. The percentage of high school students in departmentalized classes taught by teachers with neither an in-field certification nor an in-field major ranged from 6 percent for social science to 10 percent for mathematics (see tables 2-3 and A-5).

## GRADES 4 AND 8: RESULTS FROM THE NATIONAL ASSESSMENT OF EDUCATIONAL PROGRESS

In NAEP, the assessed students identified the teacher who taught them in the subject area of the assessment (e.g., reading or mathematics), and these teachers were asked to provide information related to their demographic characteristics; preparation, credentials, and experiences; attitudes and expectations; job support; and job satisfaction. NAEP was conducted in mathematics and reading in grades 4 and 8 in 2013 and 2015.

In this section, results are presented for public school students in grades 4 and 8. Results for each grade are presented for the nation, states, large cities, and TUDA districts and by selected school and student characteristics. Results for 2015 are presented and supplemented with results from 2013, when relevant, to show recent changes.

Fourth-grade students, or elementary students in general, are often taught by the same teacher for reading and mathematics. For example, according to the 2015 NAEP mathematics assessment, approximately 72 percent of 4th-grade students were taught by a mathematics teacher who teaches all or most subjects. For this reason, one would expect few differences between these subject areas in the prevalence of teachers with permanent certification. Therefore, in the body of the text, results for grade 4 are presented only for the mathematics assessment. For grade 8, results are presented for the mathematics and reading assessments.

All NAEP estimates and their standard errors for this section can be found in appendix A. Data for 2013 and 2015 can be found in tables A-6 through A-17 for grade 4 mathematics; in tables A-18 through A-29 for grade 4 reading; in tables A-30 through A-42 for grade 8 mathematics; and in tables A-43 through A-54 for grade 8 reading.

Teachers of the assessed students were asked, “Do you hold a regular or standard certificate that is valid in the state in which you are currently teaching?” with four response options to consider:

1. “Yes, I hold a permanent certificate;”
2. “Yes, I hold a temporary certificate. (This type of certificate may require additional coursework, student teaching, etc.);”
3. “No, but I am currently working toward certification;” and
4. “No, and I am not planning to obtain certification.”

For this report, the percentage of students with teachers who have state certification includes teachers who selected response option (1) “Yes, I hold a permanent certificate.” All other responses were recoded to calculate the percentage of students with teachers who do not have a permanent certification. In the following

section, therefore, references to “teachers with certification” or “certified teachers” reflect this definition. Readers should note that the question and responses differ from those posed in SASS; therefore, direct comparisons should not be made between the results from the two surveys.

## GRADE 4

**Results across student subgroups:** Nationally, in both 2013 and 2015, over 90 percent of all public school students in grade 4 had a teacher who had a permanent teaching certificate in the state where they taught (92 percent in 2015 and 93 percent in 2013). In 2015, across the school locales, this percentage was lower for students in city schools (90 percent) than in suburban schools (93 percent) and rural schools (92 percent). In public schools with high percentages of minority students (defined in this report as schools with minority enrollment of 75 percent or higher), this percentage was lower than it was in schools with less than 75 percent minority enrollment (90 vs. 93 percent). In 2013, the percentage of 4th-grade students who had a state-certified teacher was about the same in cities and suburban schools (94 percent each), and both percentages were higher than the percentage for students in towns (91 percent) (see table A-6).

The percentage of 4th-grade students with a teacher who had a state certification varied across the states,<sup>5</sup> ranging from 61 percent in Ohio and 64 percent in the District of Columbia to almost 100 percent in Alabama in 2015. The percentage of 4th-grade students who had a teacher with state certification was higher than 90 percent in 27 states. In 2013, the percentage ranged from 66 percent in Ohio and 72 percent in the District of Columbia to almost 100 percent in Nebraska (see table A-7).

<sup>5</sup>Throughout this report, references to “states” include the 50 states and the District of Columbia.

In large cities, the percentage of 4th-grade students with a teacher who had a state certification was 88 percent in 2015 and 92 percent in 2013. For the 21 urban school districts that participated in NAEP’s Trial Urban District Assessment in 2015 (the TUDA districts),<sup>6</sup> the percentage ranged from 67 percent in Cleveland to 97 percent in Miami-Dade. In addition, for the 21 TUDA districts that participated in the 2013 NAEP, the percentage ranged from 65 percent in Cleveland to 99 percent in Hillsborough County (see table A-8).

## Results by student subgroups

**Race and ethnicity:** In NAEP, information on race and ethnicity is collected for each student from the sampled school. NAEP typically reports race/ethnicity using seven mutually exclusive race/ethnicity categories: American Indian/Alaska Native, Asian, Black, Native Hawaiian/Pacific Islander, Hispanic, White, and Two or more races.<sup>7</sup> Although results for three major groups—Black, Hispanic, and White—are highlighted here, results for all race/ethnicity categories are available in the data tables in **appendix A**.

In 2015, the percentage of 4th-grade students who had a certified teacher was lower for Black students (90 percent) than for White students (92 percent), while there was no measurable difference between the percentages of Hispanic students (92 percent) and White students (see table 2-4). Unlike 2015, in 2013, the percentage of 4th-grade students who had certified teachers was not measurably different for Black and White students. However, such percentages varied by school locale and the percentage of minority enrollment. For example, in both years, for students in schools located in cities and in

<sup>6</sup>See the Technical Notes, table TN-2, for a full listing of the 2013 and 2015 participating TUDA districts and their states.

<sup>7</sup>Throughout this report, all students of Hispanic origin are categorized as Hispanic regardless of race, and all students referred to as being in a specific race category are non-Hispanic.

schools with high-minority enrollment, the percentage who had teachers with certification was lower for Black students than for White students (see table A-6).

**TABLE 2-4.** Percentage of 4th-grade public school students who had a mathematics teacher with state certification, by selected race/ethnicity and school characteristics: 2015

Selected characteristic	White	Black	Hispanic
<b>Nation (public)</b>	92.2	89.9*	92.0
<b>Location</b>			
City	92.5	86.1*	90.0*
Suburban	92.8	92.7	93.0
Town	91.5	93.7	92.8
Rural	91.5	94.4*	96.0*
<b>Minority enrollment</b>			
75 percent or more	91.8	88.2*	90.6
Less than 75 percent	92.2	92.2	94.1*

\* Significantly different ( $p < .05$ ) from the percentage for White.  
NOTE: Race/ethnicity based on school records. Race categories exclude persons of Hispanic ethnicity.  
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2015 Mathematics Assessment.

In eight states in 2015, the percentage of 4th-grade students who had a teacher with certification was lower for Black students than for White students. For example, in the District of Columbia, 59 percent of Black students had a teacher with certification, compared to 83 percent of White students. In contrast, in North Dakota and Rhode Island, the percentages of students who had a teacher with certification were higher for Black students than for White students. The results varied similarly across the states in 2013 (see table A-7).

In five states in 2015, the percentage of Hispanic 4th-graders whose teachers had certification was lower than the percentage of White students, with a 16-percentage-point gap in the District of Columbia. However, in three states—Iowa, Massachusetts, and Michigan—the percentages of students who had a teacher with certification were higher for Hispanic students than for White students. Similar differences across the states were seen in 2013 (see table A-7).

In 2015, within large cities,<sup>8</sup> the percentage of Black students with a teacher who had certification was lower than the percentage of White students, by about 9 percentage points (82 vs. 91 percent). A similar pattern was seen in four TUDA districts—Boston, Chicago, the District of Columbia,<sup>9</sup> and San Diego. The gap ranged from 8 percentage points in Boston (88 vs. 96 percent) and Chicago (91 vs. 99 percent) to 13 percentage points in San Diego (86 vs. 99 percent). Similar results were seen in 2013 (see table A-8).

Although no measurable difference was found in large cities overall in 2015, the percentage of Hispanic students who had a teacher with certification was lower than for White students in five TUDA districts: Albuquerque, Boston, Dallas, the District of Columbia, and San Diego. Although the results were similar in 2013, a higher percentage of Hispanic students than White students had a teacher with certification in Boston (95 vs. 90 percent) and Atlanta (about 100 vs. 97 percent) (see table A-8).

**Students with disabilities:** Within public schools in 2015, the percentage of students who had a teacher with certification was 92 percent for both SD and non-SD students (see table A-9).

Across the states, only Rhode Island in 2015 had a measurable difference in the percentage of students with and without a disability who had a teacher with certification. In Rhode Island, about 99 percent of SD students had a teacher with

<sup>8</sup> In NAEP, “large cities” includes students from all cities in the nation with populations of 250,000 or more, including the participating TUDA districts.

<sup>9</sup> The District of Columbia is classified both as a state and a TUDA district; however, the results differ due to the treatment of public charter schools. When the District of Columbia is reported as a state, public charter schools are included in the results. When it is reported as a TUDA district, public charter schools are not included in the results.



certification, compared to 96 percent of non-SD students (see table A-10).

Differences between the percentages of SD students and non-SD students who had a teacher with certification were found in only New York City in 2015 and Los Angeles in 2013. In New York City in 2015, the percentage of SD students who had a teacher with certification was lower than that of non-SD students (83 vs. 91 percent). In Los Angeles in 2013, almost all SD students, compared to 97 percent of non-SD students, had a teacher with certification (see table A-11).

**English language learners:** In 2015, about 91 percent of all ELL students had a teacher who had certification. Within rural schools, a higher percentage of ELL students had a teacher with a certification than did non-ELL students (96 vs. 92 percent). In 2013, the overall results differed, with a lower percentage of ELL students (92 percent) than non-ELL students (94 percent) who had a teacher with certification. Additionally, within city schools and schools with less than 75 percent minority enrollment, the percentage for ELL students was lower than the percentage for non-ELL students (see table A-12).

In four states (Massachusetts, Michigan, Rhode Island, and Tennessee) in 2015, the percentage of 4th-grade students who had a teacher with certification was higher for ELL students than for non-ELL students. For example, in Michigan, 97 percent of ELL students had a teacher with certification, compared to 85 percent of non-ELL students. In 2013, the percentage of ELL students was lower than the percentage for non-ELL students in five states, yet percentages were higher for ELL than non-ELL students in Connecticut, Delaware, and Georgia (see table A-13).

In two TUDA districts, the percentage of ELL students with a teacher who had certification was lower than the percentage of non-ELL students

(by 16 percentage points in Dallas and by 15 percentage points in the District of Columbia) in 2015. In contrast, in Detroit, 96 percent of ELL students had a teacher with certification, compared to 80 percent of non-ELL students. Similar contrasts across TUDA districts were observed in 2013 (see table A-14).

### Students eligible for the National School

**Lunch Program:** In 2015, the percentage of NSLP-eligible students who had a teacher with certification was lower than that for students who were not eligible (91 vs. 93 percent). The same pattern was found for students within suburban schools and schools with less than 75 percent minority enrollment. While the overall results were similar in 2013, lower percentages of NSLP-eligible than noneligible students were observed for students in schools in cities and suburbs and in both categories of minority enrollment (see table A-15).

In 2015, in seven states (the District of Columbia, Illinois, Kansas, Maryland, Nevada, New York, and Vermont), the percentage of students who had a teacher with certification was lower for NSLP-eligible students than for students who were not eligible. The differences in these states ranged from 2 percentage points in Vermont to 16 percentage points in the District of Columbia. Similarly, the percentages varied by states in 2013 (see table A-16).

In 2015, the percentage for three TUDA districts was lower for NSLP-eligible students than for noneligible students. These districts were the District of Columbia (75 vs. 86 percent), Fresno (92 vs. almost 100 percent), and San Diego (85 vs. 98 percent). Some results in 2013 were different. For example, in large cities, the percentage of NSLP-eligible students who had a teacher with certification (91 percent) was lower than the percentage of noneligible students (95 percent). In addition, in eight TUDA districts—Atlanta,

Austin, Charlotte, Dallas, District of Columbia, Fresno, Houston, and Philadelphia—the percentage was lower for NSLP-eligible students than for noneligible students, and in Boston, a higher percentage of NSLP-eligible students than noneligible students (95 vs. 90 percent) had a teacher with certification (see table A-17).

## GRADE 8

This section examines data from the NAEP mathematics and reading assessments at grade 8. It should be noted that in 2015, there was an atypically high nonresponse rate among teachers. Specifically, nine states and the District of Columbia and 15 of the 21 NAEP TUDA districts were missing teacher data for more than 15 percent of their students. Readers should use caution when interpreting data for these states and TUDA districts. More information can be found in the **Technical Notes**.

The estimates presented in the text are based on nonmissing information for the variable of interest. A footnote is included when the comparison in the text is for a category, state, or TUDA district that is missing teacher data for more than 15 percent of students.

## GRADE 8: MATHEMATICS

**Results across student subgroups:** In 2015, 90 percent of 8th-grade students had a mathematics teacher with state certification. The percentage was lower for students in schools in cities (88 percent) than in suburbs (91 percent). In schools with high percentages of minority students (i.e., with a minority enrollment of 75 percent or more), this percentage was 8 percentage points lower, at 84 percent, than in schools with less than 75 percent minority enrollment. In 2013, the same patterns generally held and the percentage of students who had a mathematics

teacher with state certification was 92 percent overall (see table A-30).<sup>10</sup>

The percentage of 8th-grade students with a mathematics teacher who had state certification varied across the states in 2015, ranging from 59 percent in the District of Columbia and 62 percent in Ohio to almost 99 percent in Nebraska. The percentage of 8th-grade students who had a mathematics teacher with state certification was higher than 90 percent in 21 states. The results for 2013 also varied by state, ranging from 62 percent in the District of Columbia to 99 percent in Illinois and Nebraska (see table A-31).<sup>11</sup>

In large cities, the percentage of 8th-grade students who had a mathematics teacher with state certification was 84 percent in 2015 and 88 percent in 2013. For the 21 TUDA districts that participated in NAEP in 2015, the percentage ranged from 68 percent in Cleveland to 99 percent in Philadelphia, and the percentage of 8th-grade students with teachers who had state certification was higher than 90 percent in five TUDA districts. Similar results were found in the TUDA districts in 2013 (see table A-32).<sup>12</sup>

## Results by student subgroups

**Race and ethnicity:** In 2015, the percentage of 8th-grade students who had a mathematics teacher with certification was lower for Black (86 percent) and Hispanic (88 percent) students than for White students (91 percent). Such percentages varied by school locale and by the percentage of school minority enrollment (see table 2-5). For example, within cities, the percentage of students who had a teacher with certification was lower

<sup>10</sup> More than 15 percent of students were missing teacher data in the category of “city” (2015) and “75 percent or more minority enrollment” (2015).

<sup>11</sup> More than 15 percent of students were missing teacher data in the District of Columbia (2013 and 2015).

<sup>12</sup> More than 15 percent of students were missing teacher data in the category of “large city” (2015) and in Cleveland (2015).



for Black students (83 percent) and Hispanic students (85 percent) than for White students (93 percent). In addition, in schools with a high percentage of minority students, the percentage of Black students with a mathematics teacher who had certification was 80 percent, compared to 88 percent for White students.<sup>13</sup>

**TABLE 2-5.** Percentage of 8th-grade public school students who had a mathematics teacher with state certification, by selected race/ethnicity and school characteristics: 2015

Selected characteristic	White	Black	Hispanic
<b>Nation (public)</b>	91.1	85.5*	87.9*
<b>Location</b>			
City	93.0	82.7*	84.7*
Suburban	91.8	87.7*	91.4
Town	89.1	84.2	91.0
Rural	89.8	89.7	83.9
<b>Minority enrollment</b>			
75 percent or more	88.1	79.7*	83.9
Less than 75 percent	91.2	91.8	92.9*

\* Significantly different ( $p < .05$ ) from the percentage for White.  
NOTE: Race/ethnicity based on school records. Race categories exclude persons of Hispanic ethnicity.  
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2015 Mathematics Assessment.

Similar patterns were observed in 2013. For example, in 2013, the percentage of 8th-grade students who had a teacher with certification was lower for Black students (89 percent) than for White students (92 percent). In addition, within cities and within schools with a high percentage of minority students, the percentage of Black students with a mathematics teacher who had certification was lower than the percentage of White students (see table A-30).

Differences by race and ethnicity were also observed at the state level in both 2015 and 2013. For example, in 2015, the percentage of 8th-grade students who had a mathematics teacher with certification was lower for Black students than for White students in 11 states, which includes a 31-point and a 29-point gap, respectively, in the District of Columbia (53 vs. 84 percent) and

Michigan (64 vs. 93 percent). In contrast, the percentages were higher for Black students than for White students in Missouri (96 vs. 90 percent) and Wisconsin (96 vs. 86 percent).<sup>14</sup>

There were also differences between the percentages of White and Hispanic 8th-grade students who had a mathematics teacher with certification. In 2015, the percentage was lower for Hispanic students than for White students in four states. The gap ranged from 2 percentage points in Nebraska (97 vs. 99 percent) to 16 percentage points in the District of Columbia (67 vs. 84 percent). In contrast, the percentage was higher for Hispanic students than for White students in Ohio (78 vs. 62 percent). In 2013, the percentage of 8th-grade students who had a teacher with certification was lower for Hispanic students than for White students in four states (see table A-31).<sup>15</sup>

Within large cities and TUDA districts, the results also differed by race/ethnicity in 2015 and 2013. In large cities in 2015, for example, the percentage of Black students with a mathematics teacher who had certification was lower than the percentage of White students by about 14 percentage points (78 vs. 92 percent). A similar pattern was seen in 11 of the 21 TUDA districts, with a 38-percentage-point gap in the District of Columbia (62 vs. almost 100 percent). In 2013, the difference in the percentage between Black and White students was 7 percentage points in large cities (84 vs. 90 percent).<sup>16</sup>

<sup>13</sup> More than 15 percent of students were missing teacher data overall (for Black students) and in the category of “75 percent or more minority enrollment.”

<sup>14</sup> More than 15 percent of students were missing teacher data in the District of Columbia, Michigan (for Black students), and Missouri (for Black students).

<sup>15</sup> More than 15 percent of students were missing teacher data in the District of Columbia (2015) and Ohio (for Hispanic students in 2015).

<sup>16</sup> More than 15 percent of students were missing teacher data in the category of “large city” (for Black students in 2013 and overall in 2015) and the District of Columbia (2015).

Comparisons between the percentages of Hispanic and White students who had a mathematics teacher with certification show lower percentages for Hispanic students than for White students in large cities and in six TUDA districts in 2015. The largest gap was in Charlotte, where 74 percent of Hispanic students, compared to 93 percent of White students, had a mathematics teacher with certification. In 2013, although the percentages of Hispanic and White students who had a mathematics teacher with certification were not measurably different in large cities overall, the percentage was lower for Hispanic students than for White students in six TUDA districts (see table A-32).

**Students with disabilities:** The percentages of students with and without a disability who had a mathematics teacher with certification in 2013 (91 and 92 percent, respectively) and 2015 (89 and 90 percent, respectively) were not measurably different. This was also the case within each locale (city, suburban, town, and rural) as well as within schools with high-minority enrollment (see table A-33).<sup>17</sup>

In 2015, only the District of Columbia and Utah had measurable state-level differences in the percentages of students with and without a disability who had a mathematics teacher with certification. In the District of Columbia, a lower percentage of SD students had a mathematics teacher with certification (50 percent) than did their non-SD peers (60 percent). In contrast, in Utah, a higher percentage of SD students had a mathematics teacher with certification (95 percent) than did their non-SD peers (90 percent). In 2013, five states had measurable differences; two reported lower percentages and three reported higher percentages for students

with disabilities than for students without disabilities (see table A-34).<sup>18</sup>

Within large cities, there were no measurable differences between the percentages of SD and non-SD students who had a teacher with certification in either 2015 or 2013. However, in 2015, the percentage of SD students who had teachers with such certification was lower than the percentage of their non-SD peers in three TUDA districts: Austin (84 vs. 90 percent), the District of Columbia (63 vs. 74 percent), and Jefferson County<sup>19</sup> (73 vs. 88 percent). A similar pattern was found in three TUDA districts in 2013 (see table A-35).<sup>20</sup>

**English language learners:** In 2015, about 88 percent of all ELL students had a mathematics teacher who had certification. No measurable differences were found between the percentages for ELL and non-ELL students overall or within any of the locale categories (city, suburb, town, and rural) or for high-minority schools in 2015 or in 2013 (see table A-36).

Within three states in 2015, the percentage of 8th-grade students who had a mathematics teacher with certification was lower for ELL students than for non-ELL students. These states were Nevada (82 vs. 89 percent), Rhode Island (92 vs. 98 percent), and Utah (77 vs. 91 percent). Similarly, in 2013, three states (Alaska, Nevada, and New Mexico) had lower percentages of ELL students than non-ELL students who had a mathematics teacher with certification (see table A-37).<sup>21</sup>

<sup>17</sup> More than 15 percent of students were missing teacher data in the categories of “city” (2013 and 2015) and “75 percent or more minority enrollment” (2013 and 2015).

<sup>18</sup> More than 15 percent of students were missing teacher data in the District of Columbia (2015).

<sup>19</sup> Jefferson County includes Louisville.

<sup>20</sup> More than 15 percent of students were missing teacher data in the District of Columbia (2015).

<sup>21</sup> More than 15 percent of students were missing teacher data in Rhode Island (2015), Utah (for ELL students in 2015), and New Mexico (for ELL students in 2013).

Within large cities, there was no measurable difference in either 2015 or 2013 between the percentage of ELL students and non-ELL students who had a mathematics teacher with certification. In two TUDA districts in 2015, Dallas and Hillsborough County, the percentage for ELL students was lower than the percentage for non-ELL students (by 7 percentage points in Dallas and by 14 percentage points in Hillsborough County). In New York City, 94 percent of ELL students had a mathematics teacher with certification, compared to 84 percent of non-ELL students. In 2013, there were five TUDA districts—Albuquerque, Austin, Dallas, Fresno, and Jefferson County—in which the percentage for ELL students was lower than the percentage for non-ELL students. However, in Detroit, almost all ELL students had a mathematics teacher with certification, compared to 82 percent of non-ELL students (see table A-38).<sup>22</sup>

### Students eligible for the National School

**Lunch Program:** In 2015, the percentage of NSLP-eligible students who had a mathematics teacher with certification was about 4 percentage points lower than the percentage for students who were not eligible (88 vs. 92 percent). The gap was 8 percentage points within city schools and 5 percentage points within schools with a minority enrollment of 75 percent or more (table 2-6). Lower percentages of NSLP-eligible than noneligible students were also observed in 2013 at the national level, within city schools, and within schools with a minority enrollment of 75 percent or more (see table A-39).<sup>23</sup>

In 13 states, the percentage of students who had a mathematics teacher with certification in 2015

was lower for NSLP-eligible students than for noneligible students. For example, in the District of Columbia, the percentage was 52 percent for NSLP-eligible students, compared to 74 percent for noneligible students, and in Arizona, the percentage was 76 percent for NSLP-eligible students, compared to 86 percent for noneligible students. In 2013, the same pattern was observed in nine states (see table A-40).<sup>24</sup>

**TABLE 2-6.** Percentage of 8th-grade public school students who had a mathematics teacher with state certification, by National School Lunch Program (NSLP) eligibility and selected school characteristics: 2015

Selected characteristic	NSLP eligible	Not NSLP eligible
<b>Nation (public)</b>	87.8*	91.7
<b>Location</b>		
City	85.1*	92.9
Suburban	90.5	92.0
Town	88.9	89.4
Rural	87.3	91.0
<b>Minority enrollment</b>		
75 percent or more	82.7*	88.0
Less than 75 percent	91.3	92.1

\* Significantly different ( $p < .05$ ) from the percentage for students who are not eligible for NSLP.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2015 Mathematics Assessment.

In 2015, within large cities, the percentage of students who had a mathematics teacher with certification was lower for NSLP-eligible students (81 percent) than for students who were not eligible (90 percent). In addition, the percentages for NSLP-eligible students were lower than the percentages for their noneligible peers in 10 of the 21 TUDA districts. In two TUDA districts (Atlanta and Detroit), the percentages were higher for NSLP-eligible students than for their noneligible peers. Similar results were seen in 2013 (see table A-41).<sup>25</sup>

<sup>22</sup> More than 15 percent of students were missing teacher data in Dallas (2015), Hillsborough County (2015), New York City (2015), Albuquerque (for ELL students in 2013), Austin (2013), and Detroit (2013).

<sup>23</sup> More than 15 percent of students were missing teacher data in the categories of “city” (2015) and “75 percent or more minority enrollment” (2015).

<sup>24</sup> More than 15 percent of students were missing teacher data in the District of Columbia (2015).

<sup>25</sup> More than 15 percent of students were missing teacher data in the category of “large city” (2015).

## GRADE 8: READING

**Results across student subgroups:** In 2015, approximately 91 percent of 8th-graders had a reading teacher who had state certification. The percentage was lower for students in schools in cities (89 percent) than in suburbs (93 percent). In schools with high-minority enrollment, the percentage was 4 percentage points lower, at 88 percent, than it was in schools where the minority enrollment was less than 75 percent. The results from 2013 show the same pattern (see table A-42).<sup>26</sup>

In 2015, the percentage of 8th-grade students with a reading teacher who had state certification varied among the states, ranging from 68 percent in Ohio and 69 percent in the District of Columbia to about 99 percent in Illinois and Nebraska. The percentage of 8th-grade students who had a reading teacher with state certification was higher than 90 percent in 28 states. In 2013, the percentage ranged from 60 percent in the District of Columbia to almost 100 percent in Illinois, Nebraska, and Wyoming (see table A-43).<sup>27</sup>

In large cities, 87 percent of 8th-grade students had a reading teacher with state certification in 2015. For the 21 TUDA districts that participated in NAEP in 2015, the percentage of 8th-grade students who had a reading teacher with state certification ranged from 69 percent in Baltimore to almost 100 percent in Atlanta and Austin, and the percentage was higher than 90 percent for six TUDA districts. In 2013, about 90 percent of students in large cities had a reading teacher with state certification and the percentage ranged from 75 percent in Charlotte

to 98 percent in Chicago and San Diego among the TUDA districts (see table A-44).<sup>28</sup>

## Results by student subgroups

**Race and ethnicity:** In 2015, the percentage of 8th-grade students who had a reading teacher with certification was lower for Black (90 percent) and Hispanic (89 percent) students than for White students (92 percent). Similarly, within cities, the percentage of students who had a reading teacher with certification was lower for Black (88 percent) and Hispanic (85 percent) students than for White students (92 percent) (see table 2-7).<sup>29</sup>

**TABLE 2-7.** Percentage of 8th-grade public school students who had a reading teacher with state certification, by selected race/ethnicity and school characteristics: 2015

Selected characteristic	White	Black	Hispanic
<b>Nation (public)</b>	92.2	89.8*	89.2*
<b>Location</b>			
City	91.7	88.4*	85.0*
Suburban	92.6	91.2	94.0
Town	92.7	91.4	86.5
Rural	91.5	89.7	90.8
<b>Minority enrollment</b>			
75 percent or more	89.7	88.0	86.6
Less than 75 percent	92.3	91.7	92.5

\* Significantly different ( $p < .05$ ) from the percentage for White.  
NOTE: Race/ethnicity based on school records. Race categories exclude persons of Hispanic ethnicity.  
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2015 Reading Assessment.

Similar patterns for Black and White students were observed in 2013, with one exception: the percentage who had a reading teacher with certification was lower for Black students than White students in schools with high-minority enrollment (87 vs. 92 percent). In addition, in 2013, no measurable differences were found between the percentages of White and Hispanic students at the national level or within the reported school characteristics (see table A-42).

<sup>26</sup> More than 15 percent of students were missing teacher data in the categories of “city” (2015), “suburban” (2015), and “75 percent or more minority enrollment” (2015).

<sup>27</sup> More than 15 percent of students were missing teacher data in the District of Columbia (2013 and 2015).

<sup>28</sup> More than 15 percent of students were missing teacher data in the category of “large city” (2015) and Baltimore (2015).

<sup>29</sup> More than 15 percent of students were missing teacher data overall (for Black and Hispanic students in 2015).



In 2015, the percentage of 8th-grade students who had a reading teacher with certification was lower for Black students than for White students in seven states, including an 18-point gap in Nevada (75 vs. 93 percent). In 2013, the same pattern was found in four states. Similarly, the percentage of 8th-grade students who had a teacher with certification was lower for Hispanic students than for White students in four states in 2015. (The gap ranged from 10 percentage points in California to 3 percentage points in Rhode Island.) However, the percentages were higher for Hispanic students than for White students in Alaska (99 vs. 96 percent) and Ohio (81 vs. 67 percent). In 2013, the percentages were lower in one state and higher in two states for Hispanic students than for White students (see table A-43).<sup>30</sup>

In 2015, no measurable difference was found between the percentage of Black students and White students in large city schools who had a reading teacher with certification. However, in 4 of the 21 TUDA districts, the percentage was lower for Black students than for White students, including gaps of 19 percentage points in Duval County (70 vs. 89 percent) and 12 percentage points in Charlotte (83 vs. 94 percent). In contrast, the percentage was higher for Black students (91 percent) than for White students (75 percent) in Boston. In 2013, the comparison within large cities was different than in 2015 in that the percentage of 8th-graders with a reading teacher who had certification was lower, by about 5 percentage points, for Black students than for White students (87 vs. 92 percent). In 2013, the percentages were lower for Black students than for White students in four TUDA districts and higher for Black students than for White students in one TUDA district.<sup>31</sup>

<sup>30</sup> More than 15 percent of students were missing teacher data in California (2015), Rhode Island (2015), and Alaska (2015).

<sup>31</sup> More than 15 percent of students were missing teacher data in the category of “large city” (for Black students in 2013 and overall in 2015), Duval County (for Black students in 2015), Charlotte (for Black students in 2015), and Boston (2015).

In both 2013 and 2015, there were no measurable differences in large cities overall between the percentages of Hispanic students and White students who had a reading teacher with certification. In both years, however, there were differences within the TUDA districts. In 2015, among the 21 TUDA districts, the percentage was lower for Hispanic students than for White students in Charlotte (87 vs. 94 percent), while the percentage was higher for Hispanic students than for White students in Boston (91 vs. 75 percent). In 2013, seven TUDA districts had a lower percentage of reading teachers with certification for Hispanic students than for White students and two had higher percentages for Hispanic than White students (see table A-44).<sup>32</sup>

**Students with disabilities:** In both 2013 and 2015, there was no measurable difference between the percentage of students with and without a disability who had a reading teacher with certification. This was also the case within each locale (city, suburb, town, and rural) as well as within schools with high-minority enrollment, with one exception: in 2013, in suburbs, a lower percentage of students with a disability than without one had a reading teacher with certification (92 vs. 94 percent) (see table A-45).<sup>33</sup>

In 2015, North Dakota and Wyoming had a higher percentage of SD students than non-SD students who had a reading teacher with certification (96 vs. 91 percent in North Dakota; 97 vs. 91 percent in Wyoming). In contrast, in 2013, two states had a lower percentage of SD students than non-SD students who had a reading teacher with certification (95 vs. 99 percent in Delaware and 90 vs. 95 percent in Hawaii). In addition, in Minnesota in 2013, the percentage

<sup>32</sup> More than 15 percent of students were missing teacher data in Charlotte (for Hispanic students in 2015).

<sup>33</sup> More than 15 percent of students were missing teacher data overall (for SD students in 2013) and in the categories of “city” (2013), “suburban” (2013), and “75 percent or more minority enrollment” (2013).

was higher for those with a disability (almost 100 percent) than for those without one (98 percent) (see table A-46).<sup>34</sup>

In both years, within large cities, there were no measurable differences by disability status in the percentage of students who had a reading teacher with certification. In 2015, in two TUDA districts, the percentage of SD students who had a reading teacher with certification was lower than the percentage for their non-SD peers (96 vs. almost 100 percent in Atlanta and 70 vs. 84 percent in the District of Columbia). In contrast, the percentage of SD students who had a reading teacher with certification was higher than the percentage for their non-SD peers in Boston (95 vs. 87 percent) and Detroit (90 vs. 84 percent). In 2013, the percentage of SD students who had a reading teacher with certification was lower than the percentage for students without a disability in one TUDA district. However, the percentage of students with a disability who had a reading teacher with certification was higher than the percentage for students without a disability in two TUDA districts (see table A-47).<sup>35</sup>

**English language learners:** In 2015, about 91 percent of all ELL students had a reading teacher who had certification, which was not measurably different from the percentage for non-ELL students. In suburban schools, the percentage for ELL students (95 percent) was higher than the percentage for non-ELL students (93 percent). In 2013, about 92 percent of ELL students had a reading teacher who had certification (see table A-48).<sup>36</sup>

<sup>34</sup> More than 15 percent of students were missing teacher data in North Dakota (2015), Wyoming (for SD students in 2015), Delaware (2013), and Hawaii (for SD students in 2013).

<sup>35</sup> More than 15 percent of students were missing teacher data in the category of “large city” (2013 and 2015), the District of Columbia (2015), Boston (2015), and Detroit (2015).

<sup>36</sup> More than 15 percent of students were missing teacher data overall (for ELL students in 2015) and in the category of “suburban” (for ELL students in 2015).

In 2015, the percentage of 8th-grade students who had a reading teacher with certification was lower for ELL students than for non-ELL students (73 vs. 96 percent) in Alaska. However, the percentage was higher for ELL students than for non-ELL students in three other states. In Ohio, for example, there was a 22-percentage-point difference (89 vs. 67 percent). In 2013, the percentage of 8th-grade students who had a reading teacher with certification was lower for ELL students than for non-ELL students in three states and higher for ELL students than for non-ELL students in two states (see table A-49).<sup>37</sup>

Within large cities, in both 2015 and 2013, there were no measurable differences in the percentages of ELL and non-ELL students who had a reading teacher with certification. However, in the TUDA district of Albuquerque in 2015, the percentage for ELL students was 7 points lower than the percentage for non-ELL students. In contrast, higher percentages of ELL students than non-ELL students in Chicago (almost 100 percent vs. 95 percent) and Detroit (95 vs. 83 percent) had a reading teacher with certification. In 2013, the percentage for ELL students was lower than the percentage for non-ELL students in Boston, but higher for ELL students than for non-ELL students in Austin, Cleveland, and Fresno (see table A-50).<sup>38</sup>

### **Students eligible for the National School Lunch Program:**

In 2015, the percentage of students eligible for the NSLP who had a reading teacher with certification was about 3 percentage points lower (90 percent) than the percentage for students who were not eligible (93 percent). In city schools, there was a gap of 6 percentage points (87 vs. 92 percent). In 2013, only in city

<sup>37</sup> More than 15 percent of students were missing teacher data in Alaska (2015), Illinois (2015), and Washington (2015).

<sup>38</sup> More than 15 percent of students were missing teacher data in the category of “large city” (2013 and 2015), Albuquerque (2015), Chicago (2015), Detroit (2015), Cleveland (2013), and Fresno (2013).

schools was there a lower percentage of NSLP-eligible students than noneligible students who had a reading teacher with certification (90 vs. 93 percent) (see table A-51).<sup>39</sup>

In 2015, the percentage of students who had a teacher with certification was lower for NSLP-eligible students than for noneligible students in six states (for example, Nevada, where the percentage was 83 vs. 92 percent). However, the percentage was higher for NSLP-eligible students than for noneligible students in three states, with differences of 3 percentage points in New Hampshire and North Dakota and 2 percentage points in Wyoming. In 2013, in seven states, the percentage was lower for students who were eligible for the NSLP than for students who were not eligible. In contrast, the percentage was higher for NSLP-eligible students than for noneligible students in the District of Columbia and New Mexico (see table A-52).<sup>40</sup>

Within large cities, there were no measurable differences in either 2015 or 2013 between the percentages of NSLP-eligible students and noneligible students who had a reading teacher with certification. In 5 of the 21 TUDA districts participating in 2015, the percentages of students who had a reading teacher with certification were lower for NSLP-eligible students than for noneligible students. For example, in Baltimore, 66 percent of NSLP-eligible students had a

reading teacher with certification, compared to 82 percent of noneligible students. In contrast, the percentage for NSLP-eligible students was higher than the percentage for their noneligible peers in Detroit (87 vs. 80 percent). For the TUDA districts participating in 2013, there was a lower percentage of NSLP-eligible students than of noneligible students in six districts and a higher percentage of NSLP-eligible students than of noneligible students in three districts (see table A-53).<sup>41</sup>

## CONCLUSION

The snapshot of teacher certification presented in this chapter, based on data collected from the NCES 2011–12 SASS and the 2013 and 2015 NAEP, indicates that about 9 out of 10 U.S. K–12 public school students were taught by certified teachers. However, the percentage of students who had a teacher with state certification varied when the data were further explored by student and school characteristics and across states and urban districts. Students in certain locales and states appeared to be less likely to have teachers with state certification. Some student groups stand out: in particular, Black students, Hispanic students, students in high-minority schools, and students eligible for the NSLP (a proxy measure of socioeconomic status) were less likely to have certified teachers than were their respective peers.

<sup>39</sup> More than 15 percent of students were missing teacher data overall (for NSLP students in 2015) and in the category of “city” (for NSLP students in 2015).

<sup>40</sup> More than 15 percent of students were missing teacher data in New Hampshire (2015), North Dakota (2015), and the District of Columbia (2013).

<sup>41</sup> More than 15 percent of students were missing teacher data in the category of “large city” (for NSLP students in 2015), Baltimore (2015), and Charlotte (for NSLP students in 2015).



# CHAPTER 3. To What Extent Are Students Taught by Teachers with More than 5 Years of Experience or by Teachers with a Postsecondary Degree in the Field That They Teach?

Another measure that was found to be related to student achievement is the experience level of the classroom teacher (Goldhaber, Lavery, and Theobald 2015; Rice 2013). Both the Schools and Staffing Survey (SASS) and the National Assessment of Educational Progress (NAEP) provide information to answer the question:

**What percentage of public school students are taught by teachers with more than 5 years of experience? Does this percentage differ by various student and school characteristics and across various jurisdictions?**

Results are presented first on students in K–12 public schools and include national-level data on teacher experience from the 2011–12 SASS. The following section focuses on students in grades 4 and 8 and presents data on teacher experience for the nation, states, large cities, and urban districts from the 2015 NAEP. In addition, information from NAEP is used to explore the percentage of teachers with a postsecondary degree in the subject they are teaching.

## TEACHER EXPERIENCE

### K–12: RESULTS FROM THE SCHOOLS AND STAFFING SURVEY

For SASS, teachers were asked to provide the number of years they taught full or part time in public and private schools, but not to include

time spent as a student teacher. Their responses were categorized into the following categories: “1 to 5 years,” “6–10 years,” “11–15 years,” “16–25 years,” and “26 or more years.”

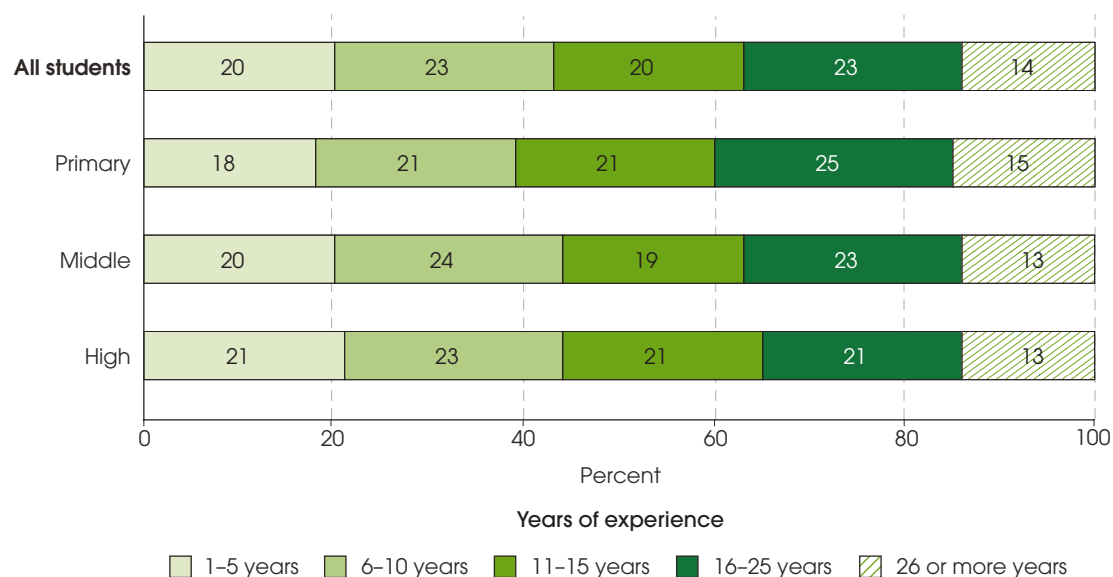
**Results across student subgroups:** Overall, 20 percent of K–12 students were taught by teachers with 1–5 years of experience and 80 percent were taught by teachers with more than 5 years. Specifically, 23 percent were taught by teachers with 6–10 years of experience, 20 percent by teachers with 11–15 years, 23 percent by teachers with 16–25 years, and 14 percent by teachers with 26 or more years (see figure 3-1 and table B-1).

### GRADE 4 AND 8: RESULTS FROM THE NATIONAL ASSESSMENT OF EDUCATIONAL PROGRESS

For NAEP, teachers were asked, “Excluding student teaching, how many years have you worked as an elementary or secondary teacher, counting this year?” The six response options were

1. “less than 1 year,”
2. “1–2 years,”
3. “3–5 years,”
4. “6–10 years,”
5. “11–20 years,” and
6. “21 or more years.”

**FIGURE 3-1.** Percentage distribution of grade K–12 public school students in classes taught by teachers with various years of teaching experience, by school level: 2011–12



NOTE: Data for students in combined level schools are included in the overall percentages but not shown separately. Detail may not sum to totals because of rounding.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, Schools and Staffing Survey (SASS), "Public School Teacher Data File," 2011–12.

The response options were combined to form the categories of “less than 1 year,” “2–5 years,” and “more than 5 years.” This section focuses on the comparison of the percentage of students taught by teachers with more than 5 years of experience. Research suggests that there is a significant growth in teacher effectiveness during the first 3 to 5 years and the relationship between teacher experience and student achievement is more likely to be nonlinear with a threshold of about 5 years (Clotfelter, Ladd, and Vigdor 2010; Goldhaber 2015).

Grade 4 results are provided from the 2015 Mathematics Assessment. Fourth-grade teachers, or elementary school teachers in general, often teach reading and mathematics; therefore, one would expect few differences between these subject areas in teacher years of experience. For this reason, results for grade 4 are presented only for the mathematics assessment. For grade 8, results are presented from the Mathematics and Reading Assessments.

All NAEP estimates and their standard errors for this section can be found in [appendix B](#). Data can be found in tables B-2 through B-13 for grade 4 mathematics, in tables B-14 through B-25 for grade 4 reading, in tables B-26 through B-37 for grade 8 mathematics, and in tables B-38 through B-49 for grade 8 reading.

## GRADE 4

**Results across student subgroups:** In 2015, about 76 percent of 4th-grade students had a teacher with more than 5 years of experience. The percentage of students in cities and towns who had a teacher with more than 5 years of experience (73 and 74 percent, respectively) was lower than the percentage for students in suburban and rural areas (78 percent for both). The percentage of students who had a teacher with more than 5 years of experience was lower for students in high-minority enrollment schools (72 percent) than for students in schools with less than 75 percent minority enrollment (78 percent) (see table B-2).

The percentage of 4th-grade students with a teacher who had more than 5 years of experience varied across the states, ranging from 54 percent in the District of Columbia to 87 percent in Rhode Island.<sup>42</sup> In large cities, 73 percent of 4th-grade students had a teacher with more than 5 years of experience. For the 21 TUDA districts that participated in NAEP in 2015, the percentage ranged from 60 percent in the District of Columbia to 95 percent in Los Angeles (see tables B-3 and B-4).

## Results by student subgroups

**Race and ethnicity:** The percentage of 4th-grade students who had a teacher with more than 5 years of experience was lower for Black (71 percent) and Hispanic (75 percent) students than for White students (78 percent). Similarly, within cities and suburban areas, the percentage of students with a teacher with more than 5 years of experience was lower for Black students than for White students, by 7 and 9 percentage points, respectively. In suburban areas, the percentage of Hispanic students who had a teacher with more than 5 years of experience was lower than the percentage of White students by about 5 percentage points (see table 3-1 and table B-2).

In 11 states, the percentage of 4th-grade students who had a teacher with more than 5 years of experience was lower for Black students than for White students, with the largest gap in Connecticut (64 vs. 81 percent). In 10 states, the percentage of 4th-grade students who had a teacher with more than 5 years of experience was lower for Hispanic students than for White students, with the largest gap in Oklahoma (58 vs. 75 percent) (see table B-3).

<sup>42</sup> The District of Columbia participates in NAEP as both a state and a TUDA district and results differ due to the treatment of public charter schools. When the District of Columbia is reported as a state, public charter schools are included in the results. When it is reported as a TUDA district, public charter schools are not included in the results.

**TABLE 3-1.** Percentage of 4th-grade public school students who had a mathematics teacher with more than 5 years of experience, by selected race/ethnicity and school characteristics: 2015

Selected characteristic	White	Black	Hispanic
<b>Nation (public)</b>	78.4	70.8*	75.2*
<b>Location</b>			
City	76.3	69.0*	73.4
Suburban	81.0	72.4*	75.8*
Town	74.0	68.8	75.6
Rural	78.0	74.5	81.7
<b>Minority enrollment</b>			
75 percent or more	71.0	68.0	74.0
Less than 75 percent	78.8	74.4*	77.1

\* Significantly different ( $p < .05$ ) from the percentage for White.

NOTE: Race/ethnicity based on school records. Race categories exclude persons of Hispanic ethnicity.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2015 Mathematics Assessment.

Within large cities, the percentage of Black students who had a teacher with more than 5 years of experience was lower than the percentage of White students by about 7 percentage points (68 vs. 75 percent). Similarly, in seven TUDA districts, the percentage of Black students with a teacher with more than 5 years of experience was lower than the percentage of White students, with the largest gap in Austin (30 vs. 81 percent). In contrast, in Los Angeles, almost all Black students, compared to 83 percent of White students, had a teacher with more than 5 years of experience. Additionally, in five TUDA districts, the percentage of Hispanic students with a teacher with more than 5 years of experience was lower than the percentage of White students, with the largest gap, of 27 percentage points, in Austin (see table B-4).

**Students with disabilities:** Overall, about 76 percent of SD students had a teacher with more than 5 years of experience. There were two comparisons where relatively fewer students with a disability than without one had a teacher with more than 5 years of experience. Within cities, a lower percentage of students with a disability (70 percent) than without one (74 percent) had a teacher with more than 5 years of experience.

In Los Angeles, the percentage of SD students who had a teacher with more than 5 years of experience (88 percent) was lower than the percentage for non-SD students (96 percent) (see tables B-5 through B-7).

**English language learners:** About 74 percent of all ELL students had a teacher with more than 5 years of experience. Within the rural locale, a higher percentage of ELL students (84 percent) than of non-ELL students (78 percent) had a teacher with more than 5 years of experience (see table B-8).

In contrast, in eight states, the percentage of 4th-grade students who had a teacher with more than 5 years of experience was lower for ELL students than for non-ELL students. The gap was largest in Oklahoma, where 48 percent of ELL students, compared to 73 percent of non-ELL students, had a teacher with more than 5 years of experience (see table B-9).

Similarly, in two TUDA districts, Austin and San Diego, the percentage of ELL students was lower than that of non-ELL students (by 12 percentage points in Austin and by 11 percentage points in San Diego) (see table B-10).

**Students eligible for the National School Lunch Program:** The percentage of NSLP-eligible students who had a teacher with more than 5 years of experience was 5 percentage points lower than that of noneligible students (74 vs. 79 percent). Similarly, the percentages for NSLP-eligible students who had a teacher with more than 5 years of experience were lower than the percentages for non-NSLP-eligible students in cities and suburbs and in schools with less than 75 percent minority enrollment (see table B-11).

In 11 states, the percentage of students who had a teacher with more than 5 years of experience was lower for NSLP-eligible students than for

noneligible students. In these states, the difference in the percentage-point differences ranged from 4 points in North Dakota to 17 points in Nevada (see table B-12).

In six TUDA districts (Albuquerque, Atlanta, Austin, Charlotte, Jefferson County, and San Diego), the percentage of students who had a teacher with more than 5 years of experience was lower for NSLP-eligible students than for noneligible students, with the largest gap, at 32 percentage points, in Austin (see table B-13).

## GRADE 8: MATHEMATICS

This section examines data from the NAEP Mathematics Assessment at grade 8 in 2015.

**Results across student subgroups:** About 75 percent of all 8th-graders had a mathematics teacher with more than 5 years of experience. For students in cities, the percentage who had a more experienced teacher (72 percent) was lower than the percentage for students in suburban and rural areas (77 and 76 percent, respectively). Furthermore, students in schools with high-minority enrollment were less likely to have a mathematics teacher with more than 5 years of experience (69 percent) than were students in schools with a minority enrollment of less than 75 percent (77 percent) (see table B-26).

The percentage of 8th-grade students with a mathematics teacher who had more than 5 years of experience varied by state, ranging from 50 percent in the District of Columbia to 89 percent in Alaska and Maine (see table B-27). For large cities, 71 percent of students had a mathematics teacher with more than 5 years of experience. Across the TUDA districts, the percentage ranged from 50 percent in the District of Columbia to 98 percent in Detroit (see table B-28).<sup>43</sup>

<sup>43</sup> More than 15 percent of students were missing teacher data in Alaska, the District of Columbia (state and TUDA), and Detroit.

## Results by student subgroups

**Race and ethnicity:** The percentages of 8th-graders with a mathematics teacher who had more than 5 years of experience were lower for Black students than for their White peers overall (70 vs. 78 percent), as well as within cities (67 vs. 76 percent) and in suburban areas (73 vs. 79 percent). The percentage was also lower for Hispanic students than for White students overall (72 vs. 78 percent) and within rural areas (65 vs. 78 percent) (see table B-26).

For 10 states, the percentage of 8th-grade students who had a mathematics teacher with more than 5 years of experience was lower for Black students than for White students. For example, the percentages in Indiana were 61 percent for Black students versus 82 percent for White students. In contrast, in the District of Columbia, a higher percentage of Black students than White students had teachers with more than 5 years of experience (57 vs. 22 percent). In five states, the percentage was lower for Hispanic students than for White students, with the largest gap in Nevada (69 vs. 88 percent). In contrast, the percentage was higher for Hispanic students than for White students in the District of Columbia (37 vs. 22 percent) and in Ohio (89 vs. 73 percent) (see table B-27).<sup>44</sup>

Within large cities, the percentage of 8th-graders who had a mathematics teacher with more than 5 years of experience was lower for Black students than for White students (66 vs. 75 percent). Similarly, in four TUDA districts, the percentage was lower for Black students than for White students. For example, in Miami-Dade, 72 percent of Black students had a mathematics teacher with more than 5 years of experience, compared to 96 percent of White students. In contrast, in Atlanta and the District of Columbia,

the percentage was higher for Black students than for White students (76 vs. 65 percent and 57 vs. 21 percent, respectively). Additionally, in six TUDA districts, the percentage of Hispanic students with a mathematics teacher with more than 5 years of experience was lower than the percentage for White students, with a 26-percentage-point gap in Baltimore City. Again, in the District of Columbia, a higher percentage of Hispanic than White students had a mathematics teacher with more than 5 years of experience (55 vs. 21 percent) (see table B-28).<sup>45</sup>

**Students with disabilities:** Overall, 74 percent of SD students had a mathematics teacher with more than 5 years of experience (see table B-29).

Within the states, Delaware had a lower percentage of SD students (76 percent) than non-SD students (83 percent) who had a mathematics teacher with more than 5 years of experience; whereas, in North Dakota, the percentage was higher for SD students (81 percent) than for non-SD students (71 percent) (see table B-30).<sup>46</sup>

Within large cities, there were no measurable differences between the percentages of students with and without a disability who had a mathematics teacher with more than 5 years of experience. In three TUDA districts—Boston, Charlotte, and Jefferson County—the percentage of SD students who had a teacher with more than 5 years of experience was lower than the percentage for students without a disability. In contrast, in the District of Columbia, the percentage was higher for SD students than for non-SD students (see table B-31).<sup>47</sup>

<sup>44</sup> More than 15 percent of students were missing teacher data in the District of Columbia and Ohio (for Hispanic students).

<sup>45</sup> More than 15 percent of students were missing teacher data in the category of “large city,” Miami-Dade, the District of Columbia, and Atlanta (for White students).

<sup>46</sup> More than 15 percent of students were missing teacher data in North Dakota (for SD students).

<sup>47</sup> More than 15 percent of students were missing teacher data for the category of “large city” (for SD students), in Boston (for SD students), and in the District of Columbia.



**English language learners:** About 71 percent of all ELL students had a mathematics teacher with more than 5 years of experience, compared with 76 percent of non-ELL students.<sup>48</sup> Within the school-level variables included in this report, no measurable differences were found between the percentages of ELL students and non-ELL students (see table B-32).

In five states, the percentage of 8th-graders with a mathematics teacher with more than 5 years of experience was lower for ELL students than for non-ELL students. For example, in Rhode Island, 60 percent of ELL students, compared to 83 percent of non-ELL students, had a teacher with more than 5 years of experience (see table B-33).

In two TUDA districts, Boston and Dallas, the percentage of 8th-grade ELL students who had a mathematics teacher with more than 5 years of experience was lower than the percentage for non-ELL students (by 11 percentage points in each). In Detroit, almost all ELL and non-ELL students (about 100 percent and 97 percent, respectively) had a teacher with more than 5 years of experience (see table B-34).<sup>49</sup>

**Students eligible for the National School Lunch Program:** The percentage of NSLP-eligible students who had a mathematics teacher with more than 5 years of experience (73 percent) was lower than the percentage of noneligible students (78 percent). Similarly, the percentages for NSLP-eligible students were lower than those for noneligible students in cities, suburban, and rural areas and in schools with less than 75 percent minority enrollment (see table 3-2 and table B-35).<sup>50</sup>

**TABLE 3-2.** Percentage of 8th-grade public school students who had a mathematics teacher with more than 5 years of experience, by National School Lunch Program (NSLP) eligibility and selected school characteristics: 2015

Selected characteristic	NSLP eligible	Not NSLP eligible
<b>Nation (public)</b>	<b>72.5*</b>	<b>78.4</b>
<b>Location</b>		
City	70.5*	75.2
Suburban	73.5*	79.9
Town	74.5	79.1
Rural	73.2*	78.0
<b>Minority enrollment</b>		
75 percent or more	68.6	72.1
Less than 75 percent	75.2*	79.1

\* Significantly different ( $p < .05$ ) from the percentage for students who are not NSLP eligible.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2015 Mathematics Assessment.

In 12 states, the percentage of students who had a mathematics teacher with more than 5 years of experience was lower for NSLP-eligible students than for noneligible students. The differences in these states ranged from 6 percentage points in Wyoming to 15 percentage points in Nevada. In contrast, in the District of Columbia and North Dakota, the percentage of students who had a mathematics teacher with more than 5 years of experience was higher for NSLP-eligible students than for noneligible students (57 vs. 33 percent in the District of Columbia and 75 vs. 71 percent in North Dakota) (see table B-36).<sup>51</sup>

In five TUDA districts—Austin, Charlotte, Jefferson County, Miami-Dade, and Duval County—the percentage of students who had a mathematics teacher with more than 5 years of experience was lower for NSLP-eligible students than for noneligible students. Whereas, in three districts—Atlanta, the District of Columbia, and Fresno—the percentage was higher for NSLP-eligible students than for noneligible students (see table B-37).<sup>52</sup>

<sup>48</sup> More than 15 percent of ELL students were missing teacher data for national (public).

<sup>49</sup> More than 15 percent of students were missing teacher data in Boston, Dallas, and Detroit.

<sup>50</sup> More than 15 percent of students were missing teacher data in the category of “city.”

<sup>51</sup> More than 15 percent of students were missing teacher data in the District of Columbia.

<sup>52</sup> More than 15 percent of students were missing teacher data in Miami-Dade, Duval County, the District of Columbia, and Fresno.



## GRADE 8: READING

**Results across student subgroups:** About 76 percent of all 8th-graders had a reading teacher with more than 5 years of experience. In cities, there was a lower percentage of students with more experienced teachers than there was in suburban areas (72 vs. 80 percent). Furthermore, students in schools with high-minority enrollment were less likely to have a teacher with more than 5 years of experience (70 percent) than were students in schools with less than 75 percent minority enrollment (79 percent) (see table B-38).<sup>53</sup>

The percentage of 8th-grade students with a reading teacher who had more than 5 years of experience varied by state, ranging from 61 percent in the District of Columbia to 89 percent in New Hampshire (see table B-39).<sup>54</sup>

In large cities, 72 percent of students had a reading teacher with more than 5 years of experience. For the 21 TUDA districts that participated in NAEP in 2015, the percentage ranged from 42 percent in Dallas to 97 percent in Cleveland (see table B-40).

### Results by student subgroups

**Race and ethnicity:** The percentages of 8th-graders with a reading teacher who had more than 5 years of experience was lower for Black students than for their White peers overall (72 vs. 79 percent) as well as within cities (68 vs. 77 percent), suburban areas (77 vs. 81 percent), and towns (68 vs. 80 percent). The percentage was also lower for Hispanic students than for White students overall (72 vs. 79 percent) as well as within cities (69 vs. 77 percent) and rural areas (66 vs. 78 percent) (see table B-38).

For five states, the percentage of 8th-grade students who had a reading teacher with more than 5 years of experience was lower for Black students than for White students. For example, Minnesota had a 26-percentage-point gap (55 vs. 81 percent). In nine states, the percentage was lower for Hispanic students than for White students; for example, Nevada had an 18-percentage-point gap (66 vs. 83 percent). In contrast, in New Hampshire, the percentage of teachers with more than 5 years of experience was higher for Hispanic students than for White students (96 vs. 89 percent) (see table B-39).<sup>55</sup>

Within large cities, the percentage of 8th-graders with a reading teacher with more than 5 years of experience was lower for Black students than for White students (69 vs. 78 percent). Similarly, in nine TUDA districts, the percentage was lower for Black students than for White students, with a 26-percentage-point gap in Boston (68 vs. 94 percent). In seven TUDA districts, the percentage of Hispanic students with a teacher with more than 5 years of experience was lower than the percentage for White students. For example, there was a 24-percentage-point gap in Philadelphia (75 vs. 99 percent) (see table B-40).<sup>56</sup>

**Students with disabilities:** Overall, 76 percent of 8th-graders with a disability had a reading teacher with more than 5 years of experience (see table B-41). Within states, Hawaii had a lower percentage of SD students (58 percent) than non-SD students (72 percent) who had a teacher with more than 5 years of experience; in Alaska, Idaho, North Dakota, and Wyoming, the percentage was higher for SD students than for non-SD students (see table B-42).<sup>57</sup> For three

<sup>53</sup> More than 15 percent of students were missing teacher data in the categories of “city” and “75 percent or more minority enrollment.”

<sup>54</sup> More than 15 percent of students were missing teacher data in the District of Columbia and New Hampshire.

<sup>55</sup> More than 15 percent of students were missing teacher data in Minnesota (for Black students) and in New Hampshire.

<sup>56</sup> More than 15 percent of students were missing teacher data in the category of “large city,” in Boston, and in Philadelphia (for Hispanic students).

<sup>57</sup> More than 15 percent of students were missing teacher data in Hawaii, Alaska, North Dakota, and in Wyoming (for SD students).

TUDA districts—Boston, Jefferson County, and New York City—the percentage of SD students who had a teacher with more than 5 years of experience was lower than the percentage of non-SD students (see table B-43).<sup>58</sup>

**English language learners:** About 72 percent of all ELL students had a teacher with more than 5 years of experience, compared to about 77 percent of non-ELL students.<sup>59</sup> Within the school-level characteristics explored in this report, the only measurable difference was for schools where less than 75 percent of the students were minorities; in these schools, 74 percent of ELL students, compared to 79 percent of non-ELL students, had a reading teacher with more than 5 years of experience (see table B-44).

Within five states, the percentage of 8th-grade students with a reading teacher with more than 5 years of experience was lower for ELL students than for non-ELL students. For example, in Minnesota 53 percent of ELL students, compared to 79 percent of non-ELL students, had a teacher with more than 5 years of experience (see table B-45).<sup>60</sup>

In four TUDA districts (Albuquerque, Boston, Fresno, and New York City), the percentage of 8th-grade ELL students who had a reading teacher with more than 5 years of experience was lower than the percentage for non-ELL students. In contrast, in Detroit, almost all ELL students had a teacher with more than 5 years of experience, compared to 88 percent of non-ELL students (see table B-46).<sup>61</sup>

### Students eligible for the National School

**Lunch Program:** The percentage of 8th-graders who had a reading teacher with more than 5 years of experience was lower for NSLP-eligible students than for noneligible students (74 vs. 79 percent). Similarly, the percentages for NSLP-eligible students were lower than those for noneligible students in cities and rural areas and in schools with less than 75 percent minority enrollment (see table B-47).<sup>62</sup>

In 11 states, the percentage of students who had a teacher with more than 5 years of experience was lower for NSLP-eligible students than for noneligible students. In these states, the difference in percentages ranged from 4 percentage points in Rhode Island to 15 percentage points in Nevada. However, in the District of Columbia and North Dakota, the percentage was higher for NSLP-eligible students than for noneligible students (63 vs. 55 percent in the District of Columbia and 73 vs. 64 percent in North Dakota) (see table B-48).<sup>63</sup>

Within large cities, 69 percent of NSLP-eligible students had a teacher with more than 5 years of experience, compared to 77 percent of noneligible students. A similar pattern was evident in seven TUDA districts, with a gap of 18 percentage points in Austin (49 percent of NSLP-eligible students). In contrast, in Detroit, the percentage was higher for NSLP-eligible students than for noneligible students (91 vs. 86 percent) (see table B-49).<sup>64</sup>

<sup>58</sup> More than 15 percent of students were missing teacher data in the category of “large city” (for SD students), Boston, and New York.

<sup>59</sup> For the nation (public), more than 15 percent of ELL students had missing teacher data.

<sup>60</sup> More than 15 percent of students were missing teacher data in Minnesota (for ELL students).

<sup>61</sup> More than 15 percent of students were missing teacher data in Albuquerque, Boston, Detroit, Fresno, and New York City.

<sup>62</sup> The category of “city” had more than 15 percent of students with missing teacher data. For the nation (public), more than 15 percent of NSLP-eligible students had missing teacher data.

<sup>63</sup> More than 15 percent of students were missing teacher data in the District of Columbia and Rhode Island.

<sup>64</sup> More than 15 percent of students were missing teacher data in the category of “large city” and in Detroit.

## TEACHER FIELD OF STUDY IN POSTSECONDARY EDUCATION

In this section, results are presented to answer the following question:

**What percentage of public school students are taught by teachers who had a postsecondary major or minor in the field that they teach? Does this percentage differ by various student and school characteristics and across various jurisdictions?**

In NAEP, data on whether teachers had a major or minor in a mathematics field (for students assessed in mathematics) or a reading field (for students assessed in reading) during their postsecondary studies were captured through a set of questions in the NAEP teacher questionnaire (details about these questions can be found in the **Technical Notes**). Note that the data presented here differs in several respects from results presented in the section “In-Field Certification” in chapter 2 based on the SASS data. First, the SASS data presented in chapter 2 reported on whether both the teachers’ postsecondary field of study and certification were in the subject of their main teaching assignment. Second, SASS restricts the postsecondary studies to include a major in the main teaching assignment. The NAEP data presented in this section do not include whether or not the teacher was certified and they do include postsecondary minors in the subjects taught.

Fourth-grade teachers, or elementary school teachers in general, often teach reading and mathematics and therefore one would not expect their postsecondary studies to be subject specific; therefore, results are not reported for NAEP at grade 4. Results for 2015 are presented for grade 8 for mathematics and reading. The data can be

found in tables B-50 through B-61 for grade 8 mathematics and in tables B-62 through B-73 for grade 8 reading.

### GRADE 8: MATHEMATICS

In the following section, the percentage of students whose teachers had a degree in a mathematics field includes those teachers who responded that at least one of their undergraduate or graduate majors or minors was in “mathematics education,” “mathematics,” or some “other mathematics-related subject, such as statistics.” In this section, all references to teachers are to the students’ mathematics teacher.

**Results across student subgroups:** In 2015, about 82 percent of all 8th-graders had a teacher with a degree in mathematics. This percentage was lower for students in city schools than it was for students in suburban schools (81 vs. 84 percent). In addition, 79 percent of students in high-minority schools (a minority enrollment of 75 percent or more) had a teacher who had a degree in mathematics, while 84 percent of students in schools with a minority enrollment of less than 75 percent had a teacher who had a degree in mathematics (see table B-50). Across the states, this percentage ranged from 62 percent in Louisiana to 98 percent in Minnesota (see table B-51). For large cities, 80 percent of 8th-grade students had a teacher who had a degree in mathematics. In the TUDA districts, this percentage ranged from 60 percent in Duval County to 92 percent in Detroit (see table B-52).<sup>65</sup>

### Results by student subgroups

**Race and ethnicity:** Overall, the percentage of 8th-grade students who had a teacher with a degree in mathematics was lower for Black (78 percent) and Hispanic (80 percent) students

<sup>65</sup> More than 15 percent of students were missing teacher data in Duval County and Detroit.

than for White students (85 percent). Similarly, within each locale, the percentage of students with a teacher with a mathematics degree was lower for Black than for White students. The percentage was lower for Hispanic than White students in suburban and rural schools (see table B-50).<sup>66</sup>

In seven states, the percentage of 8th-graders who had a teacher with a mathematics degree was lower for Black students than for White students; for example, in New York, 74 percent of Black students versus 94 percent of White students had a teacher with a mathematics degree.<sup>67</sup> In Nebraska, the percentage was higher for Black students than for White students. For Hispanic students, in six states, the percentage was lower than for White students, while in another three states, the percentage was higher for Hispanic students than for White students (see table 3-3 and table B-51).

Within large cities, the percentage of Black students who had a teacher with a mathematics degree was lower than the percentage of White students (76 vs. 81 percent). A similar pattern was seen in six TUDA districts, with a gap of 29 percentage points in Baltimore City (65 vs. 94 percent). In four TUDA districts, the percentage of Hispanic students who had a teacher with a mathematics degree was lower than the percentage of White students, with a 23-percentage-point gap in Philadelphia (see table B-52).<sup>68</sup>

**Students with disabilities:** Overall, the percentage of students who had a teacher with a degree in mathematics was lower for SD students than for non-SD students overall (74 vs. 84 percent) as well as for all school-level variables reported (see table 3-4 and table B-53).<sup>69</sup>

**TABLE 3-3.** Percentage point difference of 8th-grade public school students who had a mathematics teacher with an undergraduate or graduate major or minor in mathematics, by selected race/ethnicity and state: 2015

Higher percentage for White students than Black students		Lower percentage for White students than Black students		Higher percentage for White students than Hispanic students		Lower percentage for White students than Hispanic students	
State	Difference	State	Difference	State	Difference	State	Difference
Illinois	8.4	Nebraska	5.7	Maryland	11.9	Kentucky	6.7
Massachusetts	14.5			New Jersey	14.4	Nevada	6.7
New York	20.3			New York	11.6	North Carolina	7.7
North Dakota	8.6			Pennsylvania	13.3		
Rhode Island	7.0			Rhode Island	10.1		
Virginia	10.1			Wyoming	3.9		
Wisconsin	16.1						

NOTE: Difference is calculated using unrounded estimates. Teachers were classified as having a major or minor in mathematics if they answered "yes" to having a major, minor, or special emphasis in either undergraduate or graduate coursework in mathematics education, mathematics, or other mathematics-related subject, such as statistics. Race/ethnicity based on school records. Race categories exclude persons of Hispanic ethnicity. SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2015 Mathematics Assessment.

<sup>66</sup> More than 15 percent of students were missing teacher data in the category of "city."

<sup>67</sup> More than 15 percent of students were missing teacher data in New York.

<sup>68</sup> More than 15 percent of students were missing teacher data in Baltimore City and in Philadelphia (for Hispanic students).

<sup>69</sup> The categories of "city" and "75 percent or more minority enrollment" had more than 15 percent of students with missing teacher data. In addition, the nation (public) and the category of "suburb" had more than 15 percent of students with disabilities with missing teacher data.

**TABLE 3-4.** Percentage of 8th-grade public school students who had a mathematics teacher with an undergraduate or graduate major or minor in mathematics, by disability status and selected school characteristics: 2015

Selected characteristic	With disability	Without disability
<b>Nation (public)</b>	73.5*	83.6
<b>Location</b>		
City	72.7*	82.0
Suburban	74.5*	84.8
Town	72.2*	85.0
Rural	73.5*	82.6
<b>Minority enrollment</b>		
75 percent or more	71.3*	79.6
Less than 75 percent	74.3*	85.0

\* Significantly different ( $p < .05$ ) from the percentage for students without a disability.

NOTE: Teachers were classified as having a major or minor in mathematics if they answered "yes" to having a major, minor, or special emphasis in either undergraduate or graduate coursework in mathematics education, mathematics, or other mathematics-related subject, such as statistics.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2015 Mathematics Assessment.

In addition, in 36 states, lower percentages of SD students than non-SD students had a teacher with a mathematics degree (see table B-54). Similarly, in large cities and nine TUDA districts, the percentage of students who had a teacher with a mathematics degree was lower for SD students than for non-SD students (see table B-55).<sup>70</sup>

**English language learners:** About 79 percent of all ELL students had a teacher with a degree in mathematics, compared to 83 percent of non-ELL students. In addition, the percentage was lower for ELL students than for non-ELL students in schools in suburban areas and in schools with a minority enrollment of less than 75 percent (see table B-56).<sup>71</sup>

In four states, the percentage of 8th-graders with a teacher who had a mathematics degree was lower for ELL students than for non-ELL students. For instance, in Rhode Island, the percentage was 55 percent for ELL students,

compared to 96 percent for non-ELL students (see table B-57).<sup>72</sup>

In Austin, a lower percentage of ELL students than of non-ELL students had a teacher with a mathematics degree (48 vs. 73 percent). In contrast, in Detroit, a higher percentage of ELL students than of non-ELL students had a teacher with a mathematics degree (99 vs. 90 percent) (see table B-58).<sup>73</sup>

### Students eligible for the National School Lunch Program:

The percentage of NSLP-eligible students who had a teacher with a degree in mathematics (80 percent) was lower than the percentage for noneligible students (85 percent). Similarly, percentages for NSLP students were lower than percentages for noneligible students in suburban and rural areas and in schools with less than 75 percent minority enrollment (see table B-59).

In 12 states, the percentage of students who had a mathematics teacher with a mathematics degree was lower for NSLP-eligible students than for noneligible students. In these states, the differences ranged from 4 percentage points in Delaware and Wyoming to 14 percentage points in New Jersey (see table B-60).

In four TUDA districts (Albuquerque, Austin, the District of Columbia, and Philadelphia), the percentage of students who had a teacher with a mathematics degree was lower for NSLP-eligible students than for noneligible students, while in Atlanta and Miami-Dade, the percentage was higher for NSLP-eligible students than for noneligible students (see table B-61).<sup>74</sup>

<sup>72</sup> More than 15 percent of students were missing teacher data in Rhode Island.

<sup>73</sup> More than 15 percent of students were missing teacher data for the category of "large city" and in Detroit.

<sup>74</sup> More than 15 percent of students were missing teacher data in Albuquerque, the District of Columbia, Miami-Dade, Atlanta (for non-NSLP students), and in Philadelphia (for NSLP students).

<sup>70</sup> More than 15 percent of students were missing teacher data for the category of "large city."

<sup>71</sup> For the nation (public) and the category of "suburb," more than 15 percent of ELL students were missing teacher data.



## GRADE 8: READING

This section examines the percentage of students who had a reading teacher with a degree in reading. This percentage includes those teachers who responded that at least one of their undergraduate or graduate majors or minors was in “reading, language arts, or literacy education,” “English,” or some “other language arts-related subject.” In this section, all references to teachers are to the students’ reading teacher.

**Results across student subgroups:** In 2015, about 86 percent of all 8th-graders had a teacher with a degree in reading. The only significant difference within the school-level characteristics selected for this report was between the percentages for suburban (87 percent) and rural (83 percent) students (see table B-62).<sup>75</sup>

Across the states, the percentage of 8th-grade students who had a teacher with a degree in reading ranged from 67 percent in Louisiana to 97 percent in Iowa and New York (see table B-63).<sup>76</sup>

In large cities, 86 percent of 8th-grade students had a teacher with a degree in reading. In the TUDA districts, the percentage ranged from 65 percent in Cleveland to 95 percent in Boston, Jefferson County, and New York City (see table B-64).<sup>77</sup>

### Results by student subgroups

**Race and ethnicity:** There were no measurable differences in the percentages of Black or Hispanic 8th graders compared to their White

peers whose teachers had a reading degree, except in schools where minority enrollment was less than 75 percent, where the percentage was lower for Hispanic than for White students (84 vs. 87 percent) (see table B-62).

In four states, there were measurable differences in the percentage of Black students compared to White students who had a teacher with a reading degree. The percentages were lower for Black students than White students in New York (96 vs. 99 percent) and in Pennsylvania (82 vs. 90 percent), while the percentages for Black students were higher than White students in Nebraska (97 vs. 86 percent) and in Tennessee (81 vs. 66 percent). For Hispanic students, while each of the percentages were above 90 percent in New York and Rhode Island, the percentages were lower than the percentages for White students. In four states, the percentages of students who had a teacher with a reading degree were higher for Hispanic students than for White students. For example, in Montana, 82 percent of Hispanic students, compared to 74 percent of White students, had a teacher with a reading degree (see table B-63).<sup>78</sup>

In five TUDA districts (Atlanta, Boston, Charlotte, Cleveland, and Duval County), the percentage of Black students who had a teacher with a reading degree was lower than the percentage for White students, with a 22-percentage-point gap in Cleveland (56 vs. 78 percent).<sup>79</sup> In two TUDA districts, the percentage of students who had a teacher with a reading degree was lower for Hispanic students than for White students (see table B-64).

<sup>75</sup> More than 15 percent of students were missing teacher data for the category of “suburb.”

<sup>76</sup> More than 15 percent of students were missing teacher data in New York.

<sup>77</sup> More than 15 percent of students were missing teacher data for the category of “large city,” and in Cleveland, Boston, and New York.

<sup>78</sup> More than 15 percent of students were missing teacher data in New York, Pennsylvania (for Black students), and Rhode Island.

<sup>79</sup> More than 15 percent of students were missing teacher data for the category of “large city” and in Boston, Charlotte, Cleveland, and Duval County.



**Students with disabilities:** Similar to the results for mathematics, the percentage of students who had a teacher with a degree in reading was lower for SD students than for non-SD students overall (80 vs. 87 percent) as well as for all school-level variables reported (see table 3-5 and table B-65).<sup>80</sup>

**TABLE 3-5.** Percentage of 8th-grade public school students who had a reading teacher with an undergraduate or graduate major or minor in reading, by disability status and selected school characteristics: 2015

Selected characteristic	With disability	Without disability
<b>Nation (public)</b>	80.2*	86.8
<b>Location</b>		
City	83.2*	87.3
Suburban	80.3*	88.1
Town	77.0*	85.6
Rural	78.1*	84.2
<b>Minority enrollment</b>		
75 percent or more	80.2*	85.8
Less than 75 percent	80.2*	87.2

\* Significantly different ( $p < .05$ ) from the percentage for students without a disability.

NOTE: A reading teacher refers to a teacher whose students were assessed on NAEP reading. Teachers were classified as having a major or minor in reading if they answered “yes” to having a major, minor, or special emphasis in either undergraduate or graduate coursework in reading, language arts, or literacy education; English; or some other language arts-related subject.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2015 Reading Assessment.

In 21 states, lower percentages of SD students than non-SD students had a teacher with a degree in reading. In Utah, 71 percent of SD students, compared to 98 percent of non-SD students, had a teacher with a reading degree (see table B-66).<sup>81</sup>

In seven TUDA districts, a lower percentage of SD students than non-SD students had a teacher with a reading degree (see table B-67).<sup>82</sup>

**English language learners:** About 84 percent of ELL students had a teacher with a reading degree

(see table B-68). In two states, Massachusetts and New York, the percentage of 8th-grade students who had a teacher with a reading degree was lower for ELL students than for non-ELL students. In contrast, in Oklahoma, the percentage was higher for ELL students than for non-ELL students: 92 percent for ELL students versus 76 percent for non-ELL students (see table B-69).<sup>83</sup> In Boston and Detroit, lower percentages of ELL students than non-ELL students had a teacher with a reading degree (see table B-70).<sup>84</sup>

### Students eligible for the National School Lunch Program:

Overall, the percentage of students who had a teacher with a degree in reading was lower for NSLP-eligible students than for noneligible students (85 vs. 87 percent) (see table B-71). Additionally, in five states, the percentage of students who had a teacher with a reading degree was lower for NSLP-eligible students than for noneligible students, including in North Dakota with a 7-percentage-point gap (88 vs. 95 percent). In contrast, the percentages were higher for NSLP-eligible students than for noneligible students in Nebraska (92 vs. 85 percent), Nevada (89 vs. 85 percent), and Vermont (97 vs. 94 percent) (see table B-72).<sup>85</sup>

In large cities, no measurable difference was found by NSLP eligibility in the percentage of students who had a teacher with a reading degree. However, in seven TUDA districts, the percentage was lower for NSLP-eligible students than for noneligible students, and in one TUDA district, Jefferson County, the percentage was higher for NSLP-eligible students than for noneligible students (96 vs. 92 percent) (see table B-73).

<sup>80</sup> The categories of “city,” “suburb,” and “75 percent or more minority enrollment” had more than 15 percent of students with missing teacher data.

<sup>81</sup> More than 15 percent of students were missing teacher data in Utah.

<sup>82</sup> More than 15 percent of students were missing teacher data in the category of “large city.”

<sup>83</sup> More than 15 percent of students were missing teacher data in Oklahoma.

<sup>84</sup> More than 15 percent of students were missing teacher data in the nation (for ELL students) and in Boston and Detroit.

<sup>85</sup> More than 15 percent of students were missing teacher data in North Dakota and Nebraska (for NSLP-eligible students).

## CONCLUSION

The two indicators of teacher qualifications presented in this chapter, years of teaching experience and teachers' postsecondary field of study, based on data collected from the NCES 2011–12 SASS and the 2015 NAEP, indicate that about three-quarters of public school students had a teacher with more than 5 years of teaching experience and more than four-fifths of 8th-grade students had a mathematics teacher who had a major or minor in mathematics or a reading teacher who had major or minor in reading or literacy. However, these percentages of students varied when the data were further explored by school and student characteristics and across states and urban districts.

Students in certain locales and states appeared to be less likely to have teachers with more than 5 years of experience and less likely to have teachers with a postsecondary degree in their respective field of teaching. In particular, the student groups that stand out are Black students, Hispanic students, students in schools with high-minority enrollment, and students eligible for the NSLP (a proxy measure of socioeconomic status). Similar to the results on teacher certification presented in chapter 2, these students, in general, were less likely to be taught by teachers having more than 5 years of teaching experience and with a postsecondary degree in the subject area in which they teach.

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## TECHNICAL NOTES

This report presents data from two different NCES data collections: the Schools and Staffing Survey (SASS) and the National Assessment of Educational Progress (NAEP). There are differences in the methods of sampling, data collection windows, data definitions, and data processing between these surveys and, therefore, results from the two surveys should not be directly compared. This section provides information regarding the sampling methods and the data definitions relevant to this report.

### SCHOOLS AND STAFFING SURVEY

The 2011–12 SASS used a school-based sample of elementary and secondary public schools, and the Public School Teacher Data File provided nationally and state-level-representative data on K–12 public school teachers and the students they taught. NCES redesigned SASS after the data collection in 2011–12 and named it the National Teacher and Principal Survey (NTPS) to reflect the redesigned study’s focus on the teacher and principal labor market and on the state of K–12 school staff.

### SAMPLING AND DATA COLLECTION

In SASS, a school was defined as an institution that provides classroom instruction to students, has one or more teachers to provide instruction, serves students in one or more of grades 1–12,

and is located in one or more buildings apart from a private home. If two or more schools shared the same building, they were treated as different schools if they had different administrators (i.e., principal or school head).

Teachers were sampled from teacher lists received from the sampled schools or their districts. Teachers were defined as staff members who taught regularly scheduled classes to students in any of grades K–12. About 9,800 public schools and 47,600 public school teachers were sampled for the 2011–12 SASS, with participation rates of 80.4 and 84.0, respectively.

Data were collected via mailed and web-based questionnaires (see <http://nces.ed.gov/surveys/sass/question1112.asp>), with telephone and in-person follow-up. School packages were mailed in October 2011, and data collection ended in June 2012. More information about SASS can be found at <http://nces.ed.gov/surveys/sass>.

### DEFINITIONS

#### State Teaching Certification

Data are presented on the extent to which students are taught by certified teachers. The following variables were used to determine if a teacher had state teaching certification.

Results for teacher state certification were based on responses to the survey question “Which of



the following describes the teaching certificate you currently hold that certifies you to teach in THIS state?” with response options of

“1 = Regular or standard state certificate or advanced professional certificate;”

“2 = Certificate issued after satisfying all requirements except the completion of a probationary period;”

“3 = Certificate that requires some additional coursework, student teaching, or passage of a test before regular certification can be obtained;”

“4 = Certificate issued to persons who must complete a certification program in order to continue teaching;” and

“5 = I do not hold any of the above certifications in the THIS state.”

Teachers were then asked to select all of the content areas and grade ranges in which they hold a current teaching certification in the state where they teach. Specifically, for each content and grade range, the question asks: “Using Table 3 on page 23, in what content area(s) and grade range(s) does the teaching certificate marked above allow you to teach in THIS state?”

Teachers were also asked if they hold another current teaching certificate and the corresponding question is “Do you have another current teaching certificate that certifies you to teach in THIS state?” with response options as “Yes” and “No.” If the response is “Yes,” the teacher can record the additional certification using the same response options 1–5 as noted above.

## In-Field Teaching

The SASS public school teacher survey collected information on the subject taught by each of the sampled teachers as well as information on the content areas that the state certification allowed the teacher to teach. Different approaches could be taken to define and report on in-field teaching.

This report uses the results published in two other NCES reports that analyzed SASS data to examine the prevalence of in-field teaching and certification by content areas and grade ranges for middle grade students (Baldi, Warner-Griffin, and Tadler 2015) and high school students (Hill and Stearns 2015). Information is presented for students in grades 6–12 because more than 70 percent of elementary school teachers selected “General education” as main teaching assignment rather than a specific subject. For these reports, a teacher’s postsecondary education qualifications were measured by the correspondence between the major field of the teacher’s degree and the subjects taught. Three criteria were used to determine teacher certification status: the certification type, the correspondence of the certified content areas with the subject being taught, and the correspondence of the certified grade levels with the grade level being taught. To report on the match between a teacher’s assignment and college major or certification subject, a typology of subject-matter specialties was developed based on the core subjects in the Elementary and Secondary Education Act (ESEA) of 1965, as amended in the 2001 No Child Left Behind Act and state teaching certification requirements. For documentation on the survey data items used and the development of the key measures for this analysis, see the middle grades report at <http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2015815> and the high school report at <http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2015814>.

## Years of Teaching Experience

The variable “Teacher’s years of experience,” accounts for the year the teacher began teaching and is a created variable for the teacher’s adjusted years of teaching experience. Experience is calculated as the sum of years taught full or part time in public and private schools. Teaching experience may overlap by sector (public and private) or status (full or part time). To adjust for



this, the total years of experience cannot sum to more than the number of years that have elapsed between the year the teacher began teaching and the survey year (2012).

Teachers who began teaching in the 2011–12 school year are assigned 1 year of experience. Otherwise, years of experience was calculated using the responses to the following questions:

### **School year began teaching – general**

“In what school year did you FIRST begin teaching, either full-time or part-time, at the elementary or secondary level? \_\_\_\_ School year  
Do NOT include time spent as a student teacher. (Example: If you FIRST began teaching in September 2010 or in January 2011, you would report 2010–11.)”

### **School years as teacher – general, excluding leave**

“Excluding time spent on maternity/paternity leave or sabbatical, how many school years have you worked as an elementary- or secondary-level teacher in public, public charter, or private schools? \_\_\_\_ School years

*Include the current school year.*

*Do NOT include time spent as a student teacher.*

*Record whole years, not fractions or months.”*

### **School years as teacher – public/private, same school year**

“Of the school years you have worked as an elementary- or secondary-level teacher in public, public charter, or private schools, how many were – In public and private schools during the SAME school year? None or \_\_\_\_ School years

*Include the current school year.*

*Do NOT include time spent as a student teacher.*

*Record whole years, not fractions or months.”*

### **School years as teacher – public**

“Of the school years you have worked as an elementary- or secondary-level teacher in public, public charter, or private schools, how many were – In public schools only?

None or \_\_\_\_ School years

*Include the current school year.*

*Do NOT include time spent as a student teacher.*

*Record whole years, not fractions or months.”*

### **School years as teacher – private**

“Of the school years you have worked as an elementary- or secondary-level teacher in public, public charter, or private schools, how many were – In private schools only?

None or \_\_\_\_ School years

*Include the current school year.*

*Do NOT include time spent as a student teacher.*

*Record whole years, not fractions or months.”*

### **School Level**

The four-category level of school was based on grade levels offered, as reported by the school. The levels are as follows:

1 = Primary: Schools with at least one grade lower than 5 and no grade higher than 8;

2 = Middle: Schools with no grade lower than 5 and no grade higher than 8;

3 = High: Schools with no grade lower than 7 and at least one grade higher than 8; and

4 = Combined: Schools with at least one grade lower than 7 and at least one grade higher than 8. Schools with only ungraded classes were included with combined schools.

If the school was a noninterview, a sample file or other information, if available, was used to impute the school level.

## Grades Taught

Information on the grade levels taught by teachers was captured through the following questions:

**Grades taught – PK;** “Do you currently teach students in any of these grades at THIS school?

Prekindergarten

1 = Yes 2 = No”

**Grades taught – K;** “Do you currently teach students in any of these grades at THIS school?

Kindergarten

1 = Yes 2 = No”

**Grades taught – 1st;** “Do you currently teach students in any of these grades at THIS school?

1st

1 = Yes 2 = No”

....

**Grades taught – 12th;** “Do you currently teach students in any of these grades at THIS school?

12th

1 = Yes 2 = No” and

**Grades taught – Ungraded;** “Do you currently teach students in any of these grades at THIS school? Ungraded

1 = Yes 2 = No”

## Numbers of Students and Class Organization

The SASS public school teacher survey collected information on each of the sampled teacher’s classes, including the number of students in each class. Teachers also reported on the number of their students who had an Individualized Education Program (IEP), because they have disabilities or are special education students, and the number of their students who were limited English proficient or classified as English language learners (ELLs).

The questions used to report students with disabilities, English language learners, and the teachers’ class organization are as follows:

### IEP students;

“Of all the students you teach at this school, how many have an Individualized Education Program (IEP) because they have disabilities or are special education students?

0 = None or \_\_\_\_ Students”

### LEP students;

“Of all the students you teach at this school, how many are of limited-English proficiency or are English-language learners (ELLs)?

0 = None or \_\_\_\_ Students”

### Class organization;

“Which statement best describes the way YOUR classes at THIS school are organized?

1 = You instruct several classes of different students most or all of the day in one or more subjects (sometimes called Departmentalized Instruction).

2 = You are an elementary school teacher who teaches only one subject to different classes of students (sometimes called an Elementary Subject Specialist).

3 = You instruct the same group of students all or most of the day in multiple subjects (sometimes called a Self-Contained Class).

4 = You are one of two or more teachers, in the same class, at the same time, and are jointly responsible for teaching the same group of students all or most of the day (sometimes called Team Teaching).

5 = You instruct a small number of selected students released from or in their regular classes in specific skills or to address specific needs (sometimes called a “Pull-Out” Class or “Push-In” Instruction).”

In addition, to report the number of students in each class for the teacher, the responses to the following questions were used:

**Student enrollment in class;**

“During your most recent FULL WEEK of teaching at THIS school, what is the total number of students enrolled in the class you taught? \_\_\_ Students”

**Average students in class;**

“During your most recent FULL WEEK of teaching at THIS school, what is the average number of students you taught at any one time? \_\_\_ Students”

**Number of classes taught;**

“How many separate class periods or sections do you currently teach at THIS school?  
\_\_\_ Number of classes or sections”

*Do NOT include homeroom periods or study halls. (Example: If you teach 2 classes or sections of chemistry I, a class or section of physics I, and a class or section of physics II, you would report 04 classes or sections.)*

For each class, the teacher was asked to provide the enrollment recorded in the following variable and questions:

**Class 1 enrollment — Class 10 enrollment**

“For EACH class period or section that you reported in item 23, record the subject name, subject matter code, grade level code, and number of students. Number of Students (1) \_\_\_”

...

“For EACH class period or section that you reported in item 23, record the subject name, subject matter code, grade level code, and number of students. Number of Students (10) \_\_\_”

**School Location**

School location, also referred to as “school community type” in some SASS reports, is taken

from the public and private school data files, this is a created 4-level variable of urban-centric school locale code. The methodology was updated to incorporate 2000 Census population and geographic information. The categories are

- 1 = City,
- 2 = Suburb,
- 3 = Town, and
- 4 = Rural

## NATIONAL ASSESSMENT OF EDUCATIONAL PROGRESS

### SAMPLING AND WEIGHTING

This report uses data from NAEP, specifically, the 2013 and 2015 Mathematics and Reading Main NAEP assessments. The schools and students participating in NAEP assessments are selected to be nationally representative of all schools and students at the assessed grade level (i.e., grade 4, 8, or 12). The results from the assessed students are combined to provide accurate estimates of the overall performance of students in public, private, and other types of schools (e.g., Bureau of Indian Education schools and Department of Defense schools) in the nation, states, and any jurisdictions participating in the NAEP Trial Urban District Assessment (TUDA), as applicable. In order to ensure the accuracy of the estimates, the NAEP sampling procedure is complex.

Below is a brief overview of the sampling design for public schools, as NAEP state and TUDA districts involve only public schools. The sample of students in the TUDA districts that participated in NAEP is considered as an extension of the sample of students who would usually be selected by NAEP as part of state and national samples. More detailed information on sampling is available at <http://nces.ed.gov/nationsreportcard/about/nathow.aspx>.

For the selection of public schools, the Common Core of Data (CCD) data file is used as a comprehensive list of schools from each jurisdiction (a state, the District of Columbia, a U.S. territory, a TUDA district, etc.) to select schools based on location, racial/ethnic composition within each location, and student achievement with probability proportional to the size of schools. The selected school list is also verified by state representatives. In the selected schools, all students in the target grades are listed and, typically, 30 students per grade per subject are randomly selected for the assessment. See table TN-1 for participation counts for schools, teachers, and students.

Students with disabilities (SD) and English Language Learners (ELL) were included in the sample in proportion to their numbers in the student population; however, SD and ELL students in the selected samples who were deemed unable to be assessed were excluded from the assessment. Caution is needed to interpret the results, especially for SD and ELL students. The exclusion rates and the proportions of SD and ELL students vary among the states. In addition, the exclusion and accommodation rates, due to differences in policies and practices for identifying and including SD and ELL students, should be considered when comparing students' performance over time and across states. More detailed information on inclusion for the NAEP

assessment is available at <https://nces.ed.gov/nationsreportcard/about/inclusion.aspx>.

The teachers of the 4th- and 8th-grade students participating in the NAEP mathematics and reading assessments were asked to complete a teacher questionnaire (see <https://nces.ed.gov/nationsreportcard/bgquest.aspx>). Because the sampling for the teacher questionnaires was based on participating students, the responses to a particular teacher questionnaire do not necessarily represent all teachers of that subject at that grade level in the nation. It is important to note that in all NAEP reports, the student is the unit of analysis, even when information from the teacher or school questionnaire is being reported.

In order to adjust the disproportionate representation of the selected sample of students in the NAEP assessment, appropriate weights should be used to compute the estimates. In this report, the overall student weight and 62 replicate weights were used in calculating the estimates and the sampling errors of these estimates.

### MISSING DATA

It should be noted that the teacher questionnaire is voluntary and some teachers did not complete it. Therefore, in each assessment year and subject, there are missing teacher data for some students. In 2015, at the national level within public

**TABLE TN-1.** School, teacher, and student participation totals and target population, by assessment subject and grade level: 2013 and 2015

Participant	Mathematics		Reading	
	2013	2015	2013	2015
Grade 4				
School	7,540	7,230	7,530	7,240
Teacher	24,930	21,080	25,940	21,690
Student	180,250	134,750	184,040	125,820
Target population	3,523,770	3,560,520	3,481,870	3,543,850
Grade 8				
School	6,200	5,670	6,190	5,670
Teacher	16,420	12,980	17,090	13,290
Student	164,550	132,530	166,280	112,150
Target population	3,500,000	3,540,730	3,474,020	3,526,740

NOTE: Numbers are rounded. Includes only information from public schools.  
 SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2013 and 2015 Reading and Mathematics Assessment.

schools, about 6 percent of 4th-graders and 12 percent of 8th-graders were missing data for their mathematics teacher. Similarly, about 5 percent of 4th-graders and 14 percent of 8th-graders were missing data for their reading teacher. Whereas there is only one state, Alaska, with more than 15 percent of students missing teacher data in grade 4, there are 10 states for mathematics and 17 states for reading with 15 percent of students missing teacher data in grade 8 (the percentage of missing data for these states ranges from 16 percent to 37 percent). Therefore, especially for grade 8, estimates were suppressed (i.e., reported as “† Reporting standards not met” in the data tables) if more than 50 percent of all students had missing teacher data and are not reported in the discussion. Comparisons in the discussion are flagged with a footnote if more than 15 percent of students had missing teacher data. It should be noted that the NAEP teacher survey and SASS differ in their reporting goals and consequently in their operational procedures: sampling, recruiting, and following up. All of these factors may explain the different response rates between NAEP and SASS.

## DEFINITIONS

### Teacher Certification

Regarding their teaching certificates, teachers of the assessed students were asked “Do you hold a regular or standard certificate that is valid in the state in which you are currently teaching?” with four response options to consider: “Yes, I hold a permanent certificate,” “Yes, I hold a temporary certificate. (This type of certificate may require additional coursework, student teaching, etc.),” “No, but I am currently working toward certification,” and “No, and I am not planning to obtain certification.” For this report, the percentage of students with teachers who have a permanent certification includes teachers who selected the response option “Yes, I hold a permanent certification.” All other responses were recoded to calculate the percentage of students with teachers who do not have a permanent certification.

### Years of Experience

The NAEP teacher questionnaire asked teachers, “Excluding student teaching, how many years have you worked as an elementary or secondary teacher, counting this year?” with six options from which to choose: “less than 1 year,” “1–2 years,” “3–5 years,” “6–10 years,” “11–20 years,” and “21 or more years.” For this report, these options were collapsed into three categories, as follows: “less than 1 year,” “1–5 years,” and “more than 5 years.” Among these three options, the results focus particularly on the “more than 5 years” category.

### Major/Minor in Postsecondary Studies

The NAEP teacher questionnaire also asked teachers about their major and minor during their postsecondary studies. More specifically, teachers were asked, “Did you have a major, minor, or special emphasis in any of the following subjects as part of your undergraduate/graduate coursework?” for various postsecondary studies. Undergraduate and graduate coursework were asked about separately and both had the same three response options: “Yes, a major,” “Yes, a minor or special emphasis,” and “No.” In this report, teachers who have at least one major or minor in either their undergraduate or their graduate postsecondary studies related to their teaching subject are recognized as those who have a degree in that subject. For example, mathematics teachers with a degree in mathematics are those who responded that at least one of their undergraduate or graduate majors or minors was either “mathematic education,” “mathematics,” or some “other mathematics-related subject, such as statistics.” In a similar vein, reading teachers with a degree in reading are those who responded that at least one of their undergraduate or graduate majors or minors was either “reading, language arts, or literacy education,” “English,” or some “other language arts-related subject.”



## States, Trial Urban Districts, Large City, Urbanicity, and Minority Enrollment

All 50 states and the District of Columbia participated in NAEP in 2013 and 2015. In addition, a total of 22 urban districts participated in the 2013 and 2015 NAEP assessments; table TN-2 provides a list of the full names of

these districts, including the state where they are located, the assessment years in which they participated, and the percentage of students with missing teacher data.

The District of Columbia is classified both as a state and a TUDA district; however, the results

**TABLE TN-2.** List of participating districts in the NAEP Trial Urban District Assessment (TUDA) and the percentages of students with missing teacher certification data, mathematics: 2013 and 2015

NAEP TUDA district	State	2013				2015			
		Grade 4		Grade 8		Grade 4		Grade 8	
		Participated	Percentage of students with missing teacher data	Participated	Percentage of students with missing teacher data	Participated	Percentage of students with missing teacher data	Participated	Percentage of students with missing teacher data
Albuquerque Public Schools	NM	•	12	•	14	•	11	•	24
Atlanta Public Schools	GA	•	7	•	23	•	2	•	9
Austin Independent School District	TX	•	5	•	20	•	3	•	8
Baltimore City Public Schools	MD	•	7	•	22	•	6	•	17
Boston Public Schools	MA	•	8	•	13	•	11	•	18
Charlotte-Mecklenburg Schools	NC	•	2	•	5	•	1	•	9
Chicago Public Schools	IL	•	9	•	14	•	12	•	25
Cleveland Metropolitan School District	OH	•	10	•	19	•	20	•	40
Dallas Independent School District	TX	•	6	•	11	•	12	•	39
Detroit Public Schools	MI	•	15	•	31	•	24	•	26
District of Columbia Public Schools	DC	•	11	•	34	•	15	•	35
Fresno Unified School District	CA	•	4	•	13	•	5	•	42
Hillsborough County Public Schools	FL	•	8	•	14	•	15	•	25
Houston Independent School District	TX	•	2	•	18	•	7	•	16
Jefferson County Public Schools <sup>1</sup>	KY	•	3	•	8	•	1	•	6
Los Angeles Unified School District	CA	•	10	•	14	•	16	•	24
Miami-Dade County Public Schools	FL	•	5	•	13	•	14	•	30
Milwaukee Public Schools	WI	•	1	•	15	—	—	—	—
New York City Department of Education	NY	•	7	•	20	•	21	•	32
School District of Philadelphia	PA	•	6	•	20	•	11	•	13
San Diego Unified School District	CA	•	3	•	6	•	10	•	6
Duval County Public Schools	FL	—	—	—	—	•	5	•	15

— Not applicable (did not participate).

• Participated in the Trial Urban District Assessment (TUDA).

<sup>1</sup> Jefferson County includes Louisville.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2013 and 2015 Mathematics Assessments.



differ due to the treatment of public charter schools. When the District of Columbia is reported as a state, public charter schools are included in the results. When it is reported as a TUDA district, public charter schools are not included in the results. This distinction comes by way of the 2009 change in NAEP methodology such that charter schools are included in TUDA results only if they contribute to the district's Annual Yearly Progress (AYP) report under the Elementary and Secondary Education Act. School districts vary in whether charter schools are independent and not included in the AYP report; however, all District of Columbia charter schools are independent of the school district and thus excluded from the TUDA estimates (NCES 2010).

Along with the TUDA results, NAEP also reports results for “large cities” (formerly referred to as large central cities). A “large city” is defined as a “territory inside an urbanized area and inside a principal city with a population of 250,000 or more.”

NAEP results are reported for four mutually exclusive categories of school locales: city, suburb, town, and rural. The categories are based on standard definitions established by the Office of Management and Budget using population and geographic information from the U.S. Census Bureau. Schools are assigned to these categories based on their physical address available in CCD. More detail on the locale codes is available at [http://nces.ed.gov/ccd/rural\\_locales.asp](http://nces.ed.gov/ccd/rural_locales.asp).

This report also classifies schools as “high-minority” schools at the national level when their enrollment is 75 percent or more minority. The percentage of White students (25 percent or less) was used to create this category.

## Race/Ethnicity

The students participating in NAEP were identified by their school as being in one of seven racial/ethnic categories: White, Black, Hispanic, Asian, American Indian/Alaska Native, Native Hawaiian/Other Pacific Islander, and Two or more races. Students who were identified as Hispanic are categorized as Hispanic even if they are identified with another racial/ethnic group. Students who were identified as being in multiple racial/ethnic groups, except Hispanic, are classified as “Two or more races.”

## Students With Disabilities

Students with disabilities are one of the main student reporting groups for NAEP. Data for student disability is collected from several questions completed by each sampled student's teacher or school administrator. An item in the questionnaire asks, for each sampled student: “Record the student's current SD classification using one of the codes below.” This question has three response options: “Has an IEP for a disability,” “Has a Section 504 Plan and needs accommodation to be tested,” and “Does not have an IEP or Section 504 Plan.” In this report, students with a disability include “Has an IEP for a disability” and “Has a section 504 Plan and needs accommodation to be tested.”

## English Language Learners

Similar to identifying students with disabilities, English language learner students are identified through the ELL worksheet completed by a school staff member knowledgeable about those students who were selected to participate in the assessment. Specifically, the ELL worksheet, for each sampled student, asks the staff member to “record the student's current ELL classification using one of the codes below,” and it has three response options: “Yes, ELL”; “No, formerly ELL,” and “No, not ELL.” Within this report, ELL students include “Yes, ELL.”

## The National School Lunch Program

The National School Lunch Program (NSLP) serves as a marker of socioeconomic status of the student's family. Students whose family income is at or below 130 percent of the poverty level qualify to receive free lunches, and students whose family income is between 130 percent and 185 percent of the poverty level qualify to receive reduced-price lunches. For the 2014–15 school year, these thresholds were \$31,005 and \$44,123, respectively, for a family of four. The classification applies only to the school year when the assessment was administered and is not based on eligibility in previous years.

NAEP data on the NSLP are collected from school records. Categories for the NSLP are “Eligible,” “Not eligible,” and “Information not available,” and the results of the first two categories were included in this report.

In 2015, a new variable was included indicating schools' status for the Community Eligibility Provision (CEP) or as a universal feeding program (UFP) school. Under these programs, 100 percent of students in schools that apply and are approved (schools with at least 40 percent eligibility in the prior year may apply) are eligible for a free lunch and breakfast (U.S. Department of Agriculture 2015). The program was phased in over a 3-year period, beginning with Washington, DC, Illinois, Kentucky, Michigan, New York, Ohio, West Virginia, Florida, Georgia, Maryland, and Massachusetts, and became nationwide in the 2014–15 school year. As such, NAEP's 2013 and 2015 assessments marked the first administrations of NAEP showing 100 percent eligibility in the NSLP for particular districts, including the TUDA Boston Public Schools (2015) and Cleveland Metropolitan School District (2013 and 2015), which currently participate in the CEP.

## DRAWING INFERENCES FROM THE RESULTS

The reported statistics are estimates and are therefore subject to a measure of uncertainty. The comparisons in this report are based on statistical tests that consider both the magnitude of the differences between percentages and the estimated standard errors of the percentages being compared. Estimates based on smaller groups are likely to have relatively large standard errors. As a consequence, a numerical difference that appears large may not be statistically significant. Furthermore, differences of the same magnitude may or may not be statistically significant, depending on the size of the standard errors.

Any difference between percentages that is identified in this report as *higher*, *lower*, *larger*, or *smaller* meets the requirements for statistical significance at the .05 level.

## ANALYZING GROUP DIFFERENCES IN PERCENTAGES

Statistical tests determine whether, based on the data from the groups in the sample, there is strong enough evidence to conclude that the averages or percentages are actually different for those groups in the population. If the evidence is strong (i.e., the difference is statistically significant), the report describes the group percentages as being different (e.g., one group has a higher percentage of teachers who have more than 5 years of teaching experience). The reader is cautioned to rely on the results of the statistical tests rather than on the apparent magnitude of the difference between sample percentages when determining whether the sample differences are likely to represent actual differences among the groups in the population.

To determine whether a real difference exists between the percentages for two groups in the population, one needs to obtain an estimate of the degree of uncertainty associated with the difference between the percentages of these groups for the sample. This estimate of the degree of uncertainty, called the “standard error of the difference” between the groups, is obtained by taking the square of each group’s standard error, summing the squared standard errors, and taking the square root of that sum.

$$SE_{A-B} = \sqrt{SE_A^2 + SE_B^2}$$

The standard error of the difference can be used, just like the standard error for an individual group percentage, to help determine whether differences among groups in the population are real. The difference between the percentages of the two groups plus or minus 1.96 standard errors of the difference represents an approximately 95 percent confidence interval. If the resulting interval includes zero, there is insufficient evidence to claim a real difference between the groups in the population. If the interval does not contain zero, the difference between the groups is statistically significant at the .05 level. No adjustments were made for multiple comparisons, which may influence the possibility of a Type I error.

The following example addresses the problem of determining whether the percentage of students who had a teacher with permanent certification in group A is higher than that in group B. The sample estimates of the percentages and estimated standard errors are as follows:

Group	Percentage	Standard error
A	59.6	0.79
B	75.7	1.84

The difference between the estimates of the average scale scores of groups A and B is 16.1 percentage points (75.7 – 59.6). The standard error of this difference is  $\sqrt{(1.84^2 + 0.79^2)} = 2.00$ . Thus, an approximately 95 percent confidence interval for this difference is plus or minus 1.96 standard errors of the difference:

$$\begin{aligned} 16.1 \pm 1.96 \times 2 \\ 16.1 \pm 3.92 \\ (12.2, 20.0) \end{aligned}$$

The value zero is not within the confidence interval; therefore, there is sufficient evidence to conclude that group A’s performance is statistically different from group B’s.

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