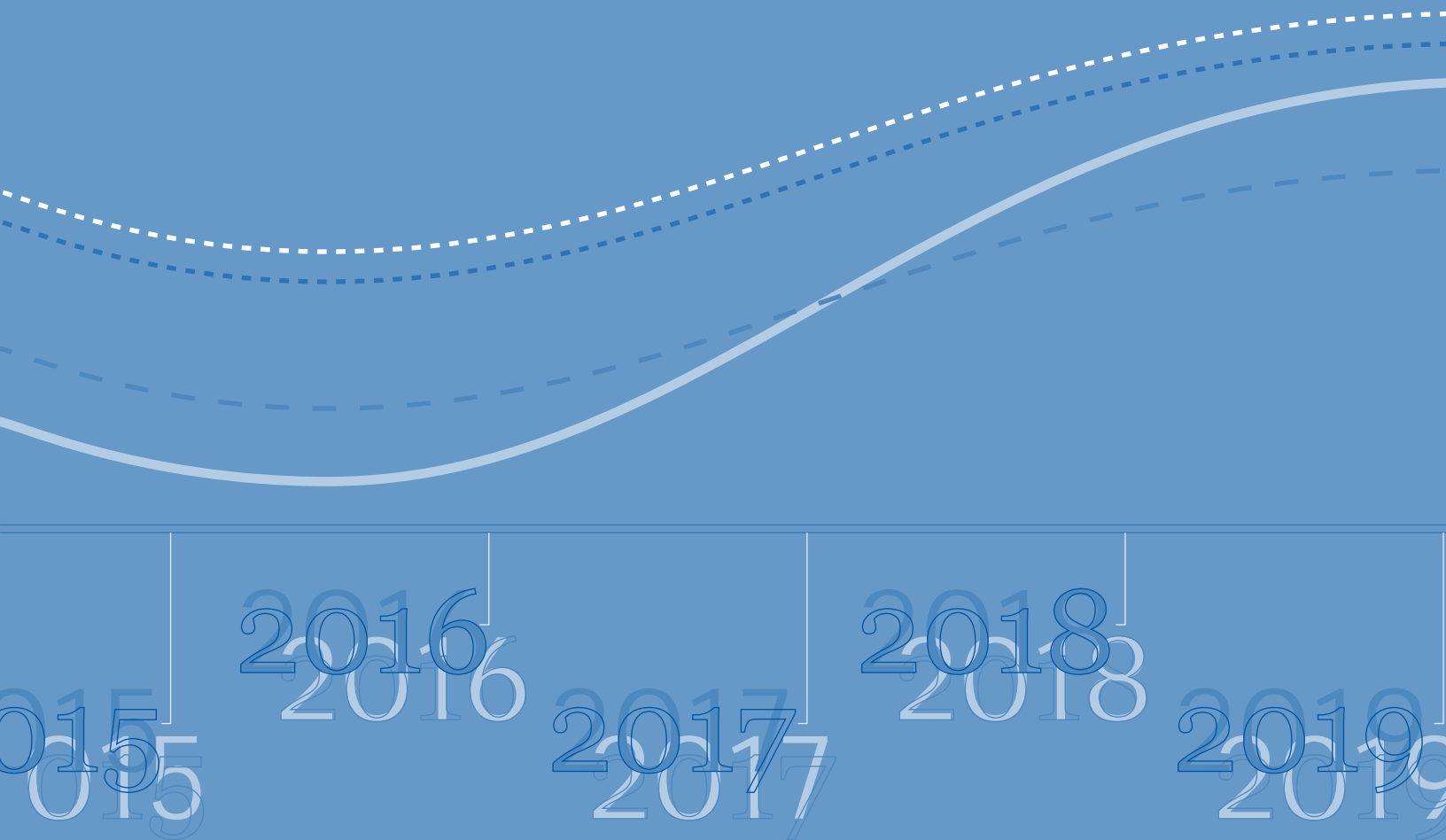


# Projections of Education Statistics to 2019

Thirty-eighth Edition





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Thirty-eighth Edition

**MARCH 2011**

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# Foreword

*Projections of Education Statistics to 2019* is the 38th report in a series begun in 1964. It includes statistics on elementary and secondary schools and degree-granting institutions. This report provides revisions of projections shown in *Projections of Education Statistics to 2018*. Included are projections of enrollment, graduates, teachers, and expenditures to the year 2019. This is the first edition of the *Projections of Education Statistics* to include projections of elementary and secondary school enrollment and high school graduates by race/ethnicity.

In addition to projections at the national level, the report includes projections of public elementary and secondary school enrollment and public high school graduates to the year 2019 at the state level. The projections in this report were produced by the National Center for Education Statistics (NCES) to provide researchers, policy analysts, and others with state-level projections developed using a consistent methodology. They are not intended to supplant detailed projections prepared for individual states.

Assumptions regarding the population and the economy are the key factors underlying the projections of education statistics.

NCES projections do not reflect changes in national, state, or local education policies that may affect enrollment levels.

Appendix A of this report outlines the projection methodology and describes the models and assumptions used to develop the national and state projections. The enrollment models use enrollment data and population estimates and projections from NCES and the U.S. Census Bureau. The models are based on the mathematical projection of past data patterns into the future. The models also use projections of economic variables from IHS Global Insight, an economic forecasting service.

The projections presented in this report are based on the 2000 census and assumptions for the fertility rate, internal migration, net immigration, and mortality rate from the Census Bureau. For further information, see appendix A.

**Val Plisko, Associate Commissioner**

Early Childhood, International, and Crosscutting  
Studies Division

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# About This Report

## PROJECTIONS

This edition of *Projections of Education Statistics* provides projections for key education statistics, including enrollment, graduates, teachers, and expenditures in elementary and secondary public and private schools. Included are national data on enrollment and graduates for the past 15 years and projections to the year 2019. Also included are state-level data on enrollment in public elementary and secondary schools and public high schools from year 2001 and projections to year 2019. This report is organized by the level of schooling with sections 1, 2, 3, and 4 concerned with aspects of elementary and secondary education and sections 5 and 6 concerned with aspects of postsecondary education.

State-level data on enrollment and graduates in private schools are not included. Further research and model development are needed to develop reliable projections of private school enrollment and graduates by state. Neither the actual numbers nor the projections of public and private elementary and secondary school enrollment include homeschooled students because more data are required to develop reliable projections.

Similar methodologies were used to obtain a uniform set of projections for each of the 50 states and the District of Columbia. These projections are further adjusted to agree with the national projections of public elementary and secondary school enrollment and public high school graduates contained in this report.

The summary of projections provides highlights of the national and state data, while the reference tables and figures present more detail. All calculations within the

*Projections of Education Statistics* are based on unrounded estimates. Therefore, the reader may find that a calculation, such as a difference or percentage change, cited in the text or figure may not be identical to the calculation obtained by using the rounded values shown in the accompanying tables.

Appendix A describes the methodology and assumptions used to develop the projections; appendix B presents supplementary tables; appendix C describes data sources; appendix D is a list of abbreviations; appendix E presents the references; and appendix F is a glossary of terms.

## LIMITATIONS OF PROJECTIONS

Projections of a time series usually differ from the final reported data due to errors from many sources, such as the properties of the projection methodologies, which depend on the validity of many assumptions.

The mean absolute percentage error is one way to express the forecast accuracy of past projections. This measure expresses the average of the absolute values of errors in percentage terms, where errors are the differences between past projections and actual data. For example, the mean absolute percentage errors of public school enrollment in grades prekindergarten–12 for lead times of 1, 2, 5, and 10 years were 0.3, 0.6, 1.3, and 2.3 percent, respectively. In contrast, mean absolute percentage errors for bachelor's degrees for lead times of 1, 2, 5, and 10 years were 0.8, 1.8, 5.9, and 13.6 percent, respectively. For more information on mean absolute percentage errors, see table A-2 in appendix A.

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# Section 1

## Elementary and Secondary Enrollment

### INTRODUCTION

Total public and private elementary and secondary school enrollment reached 55 million in fall 2007, representing a 10 percent increase since fall 1994. Between fall 2007, the last year of actual public school data, and fall 2019, a further increase of 6 percent is expected, with increases projected in both public schools and in private schools. Increases in public school enrollment are expected for Hispanics, Asians/Pacific Islanders, and American Indians/Alaska Natives, and decreases are expected for Whites and Blacks. Increases in public school enrollment are expected in the South and West, and decreases are expected in the Northeast and the Midwest.

#### Factors affecting the projections

The grade progression rate method was used to project school enrollments. This method assumes that future trends in factors affecting enrollments will be consistent with past patterns. It implicitly includes the net effect of factors such as dropouts, deaths, nonpromotion, and transfers to and from public schools. See appendixes A.0 and A.1 for more details.

#### Factors that were not considered

The projections do not assume changes in policies or attitudes that may affect enrollment levels. For example, they do not account for changing state and local policies on prekindergarten (PK) and kindergarten programs. Continued expansion of these programs could lead to higher enrollments at the elementary school level. Projections also exclude the number of students who are homeschooled because national data are available for only a limited time period.

### Accuracy of Projections

An analysis of projection errors from the past 26 editions of *Projections of Education Statistics* indicates that the mean absolute percentage errors (MAPEs) for lead times of 1, 2, 5, and 10 years out for projections of public school enrollment in grades PK–12 were 0.3, 0.6, 1.3, and 2.3 percent, respectively. For the 1-year-out prediction, this means that the methodology used by NCES has produced projections that have, on average, deviated from actual observed values by 0.3 percent. For projections of public school enrollment in grades PK–8, the MAPEs for lead times of 1, 2, 5, and 10 years out were 0.4, 0.7, 1.4, and 3.1 percent, respectively, while the MAPEs for projections of public school enrollment in grades 9–12 were 0.4, 0.7, 1.3, and 2.2 percent, respectively, for the same lead times. An analysis of projection errors from the past eight editions of *Projections of Education Statistics* indicates that the mean absolute percentage errors (MAPEs) for lead times of 1, 2, and 5 years out for projections of private school enrollment in grades PK–12 were 3.4, 4.6, and 5.5 percent, respectively. For projections of private school enrollment in grades PK–8, the MAPEs for lead times of 1, 2, and 5 years out were 3.5, 4.9 and 6.0 percent, respectively, while the MAPEs for projections of private school enrollment in grades 9–12 were 3.0, 3.8, and 3.6 percent, respectively, for the same lead times. For more information, see table A-2 in appendix A.

# NATIONAL

## Total elementary and secondary enrollment

- ▲ increased 10 percent between 1994 and 2007; and
- ▲ is projected to increase an additional 6 percent between 2007 and 2019.

## Enrollment in prekindergarten through grade 8

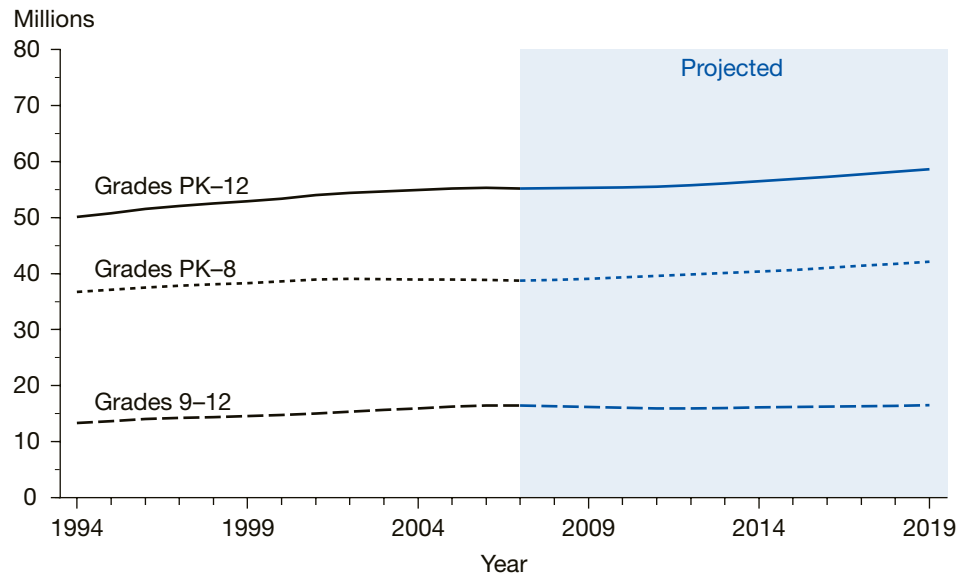
- ▲ increased 5 percent between 1994 and 2007; and
- ▲ is projected to increase an additional 9 percent between 2007 and 2019.

## Enrollment in grades 9–12

- ▲ increased 23 percent between 1994 and 2007; and
- ▲ is projected to increase less than 1 percent between 2007 and 2019.

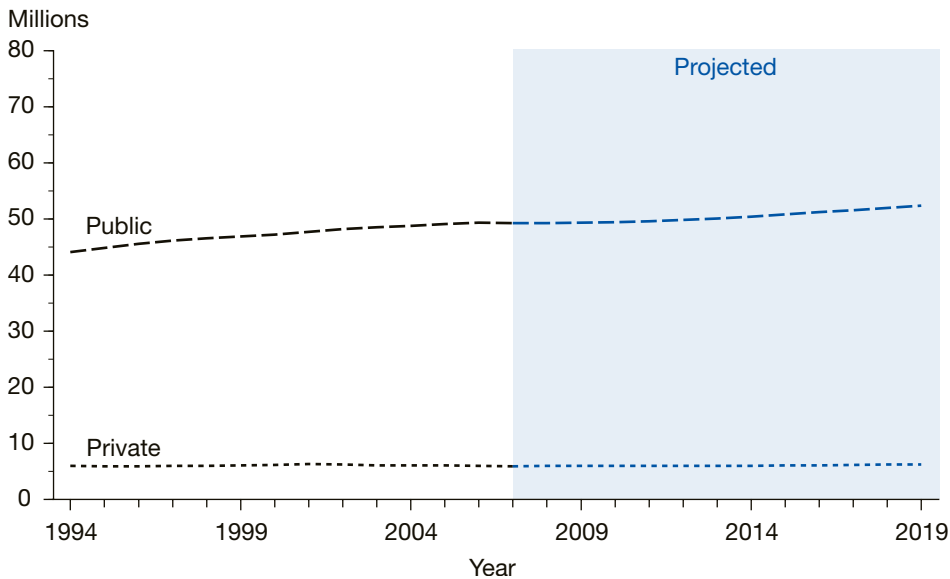
*For more information:  
Tables 1 and 2*

**Figure 1. Actual and projected numbers for enrollment in elementary and secondary schools, by grade level: Fall 1994 through fall 2019**



NOTE: PK = prekindergarten. Enrollment numbers for prekindergarten through 12th grade and prekindergarten through 8th grade include private nursery and prekindergarten enrollment in schools that offer kindergarten or higher grades. Since the biennial Private School Universe Survey (PSS) is collected in the fall of odd numbered years, private school numbers for alternate years are estimated based on data from the PSS. Some data have been revised from previously published figures. Mean absolute percentage errors of selected education statistics can be found in table A-2, appendix A. SOURCE: U.S. Department of Education, National Center for Education Statistics, Common Core of Data (CCD), "State Nonfiscal Survey of Public Elementary/Secondary Education," 1994–95 through 2007–08; Private School Universe Survey (PSS), selected years 1995–96 through 2007–08; and National Elementary and Secondary Enrollment Model, 1972–2007. (This figure was prepared April 2010.)

**Figure 2. Actual and projected numbers for enrollment in elementary and secondary schools, by control of school: Fall 1994 through fall 2019**



NOTE: Private school numbers include private nursery and prekindergarten enrollment in schools that offer kindergarten or higher grades. Since the biennial Private School Universe Survey (PSS) is collected in the fall of odd numbered years, private school numbers for alternate years are estimated based on data from the PSS. Some data have been revised from previously published figures. Mean absolute percentage errors of selected education statistics can be found in table A-2, appendix A. SOURCE: U.S. Department of Education, National Center for Education Statistics, Common Core of Data (CCD), "State Nonfiscal Survey of Public Elementary/Secondary Education," 1994–95 through 2007–08; Private School Universe Survey (PSS), selected years 1995–96 through 2007–08; and National Elementary and Secondary Enrollment Model, 1972–2007. (This figure was prepared April 2010.)

### Enrollment by control of school

Enrollment in public elementary and secondary schools

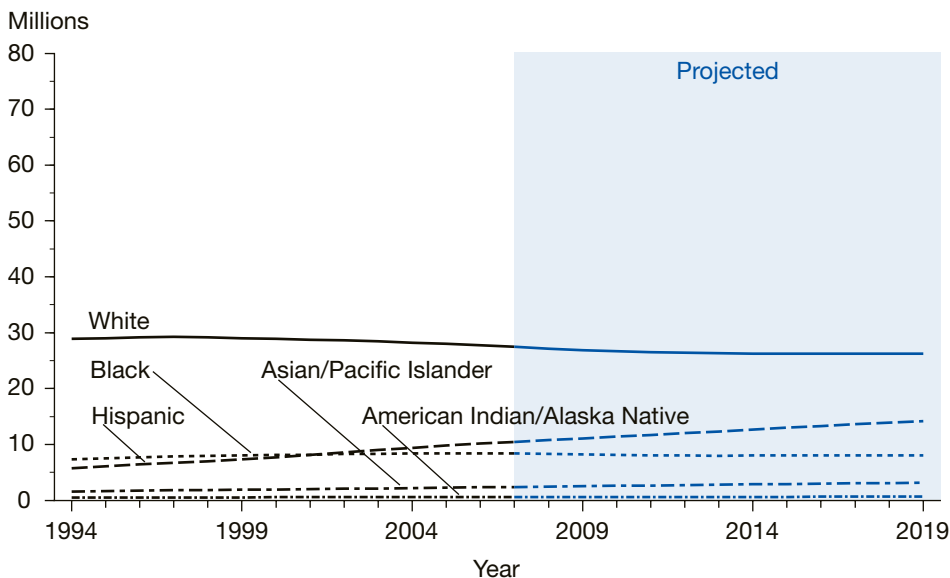
- ▲ increased 12 percent between 1994 and 2007; and
- ▲ is projected to increase an additional 6 percent between 2007 and 2019.

Enrollment in private elementary and secondary schools

- ▼ decreased 1 percent between 1994 and 2007; and
- ▲ is projected to increase 6 percent between 2007 and 2019.

*For more information:*  
*Table 1*

**Figure 3. Actual and projected numbers for enrollment in public elementary and secondary schools, by race/ethnicity: Fall 1994 through fall 2019**



NOTE: The historical racial/ethnic time-series were constructed using racial/ethnic enrollment data at the state level for individual grades. In some instances, enrollment data by race/ethnicity had to be imputed. Further, in some instances, the racial/ethnic enrollment data for individual grades had to be adjusted to the state total for that grade. For additional information see the Elementary and Secondary Enrollment section of appendix A. Race categories exclude persons of Hispanic ethnicity. Mean absolute percentage errors of selected education statistics can be found in table A-2, appendix A. SOURCE: U.S. Department of Education, National Center for Education Statistics, Common Core of Data (CCD), "State Nonfiscal Survey of Public Elementary/Secondary Education," 1994–95 through 2007–08; and National Public Elementary and Secondary Enrollment by Race/Ethnicity Model, 1994–2007. (This figure was prepared April 2010.)

### Enrollment by race/ethnicity

Between 2007 and 2019, enrollment in public elementary and secondary schools is projected to

- ▼ decrease 4 percent for students who are White;
- ▼ decrease 4 percent for students who are Black;
- ▲ increase 36 percent for students who are Hispanic;
- ▲ increase 31 percent for students who are Asian or Pacific Islander; and
- ▲ increase 13 percent for students who are American Indian or Alaska Native.

*For more information:*  
*Tables 3, 4, and 5*

## STATE AND REGIONAL (PUBLIC SCHOOL DATA)

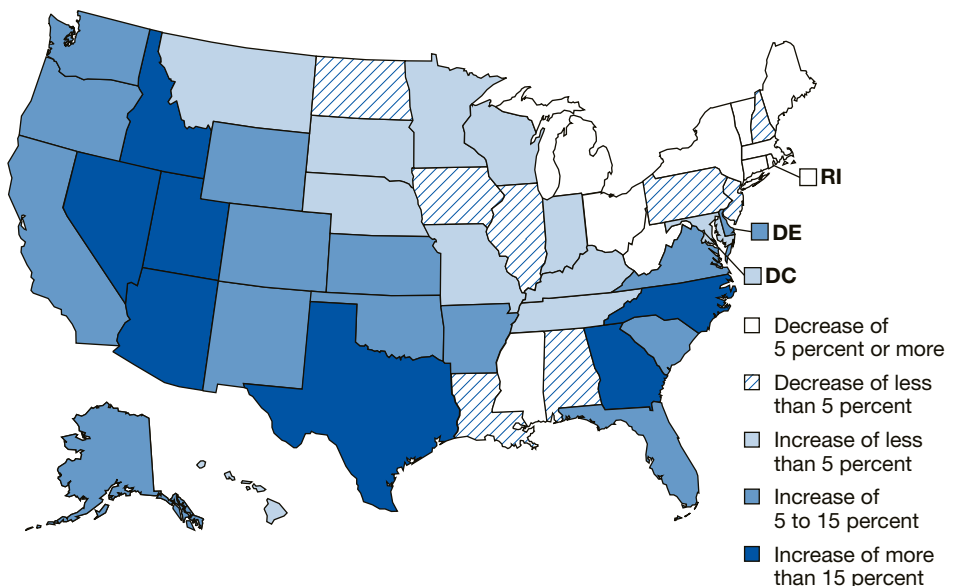
### Enrollment by state

The expected 6 percent national increase in public school enrollment between 2007 and 2019 plays out differently among the states.

- ▲ Increases are projected for 32 states and the District of Columbia, with
  - increases of more than 15 percent projected for 7 states;
  - increases between 5 and 15 percent projected for 14 states; and
  - increases of less than 5 percent projected for 11 states and the District of Columbia.
- ▼ Decreases are projected for 18 states, with
  - decreases of 5 percent or more projected for 10 states; and
  - decreases of less than 5 percent projected for 8 states.

*For more information:  
Tables 6 through 11*

**Figure 4. Projected percentage change in enrollment in public elementary and secondary schools, by state: Fall 2007 through fall 2019**



NOTE: Calculations are based on unrounded numbers. Mean absolute percentage errors of selected education statistics can be found in table A-2, appendix A.  
SOURCE: U.S. Department of Education, National Center for Education Statistics, Common Core of Data (CCD), "State Nonfiscal Survey of Public Elementary/Secondary Education," 2007-08; and State Elementary and Secondary Enrollment Model, 1980-2007. (This figure was prepared April 2010.)

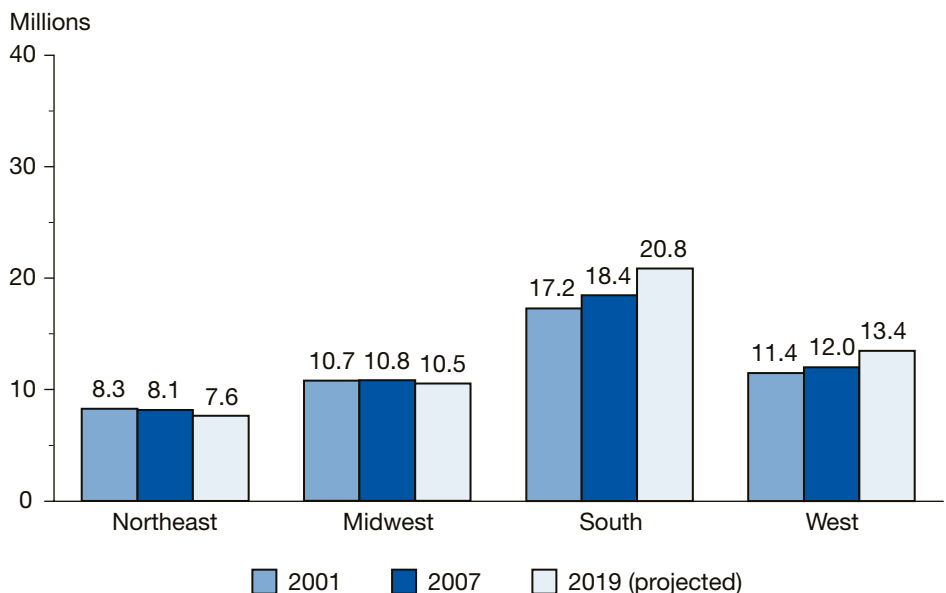
### Enrollment by region

Between 2007 and 2019, public elementary and secondary enrollment is projected to

- ▼ decrease 6 percent in the Northeast;
- ▼ decrease 3 percent in the Midwest;
- ▲ increase 13 percent in the South; and
- ▲ increase 12 percent in the West.

*For more information:  
Tables 6 through 11*

**Figure 5. Actual and projected numbers for enrollment in public elementary and secondary schools, by region: Fall 2001, 2007, and 2019**



NOTE: Calculations are based on unrounded numbers. See the glossary for a list of the states in each region. Mean absolute percentage errors of selected education statistics can be found in table A-2, appendix A.  
SOURCE: U.S. Department of Education, National Center for Education Statistics, Common Core of Data (CCD), "State Nonfiscal Survey of Public Elementary/Secondary Education," 2001-02 and 2007-08; and State Elementary and Secondary Enrollment Model, 1980-2007. (This figure was prepared April 2010.)

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# Section 2

## High School Graduates

### INTRODUCTION

The number of high school graduates increased nationally by 27 percent between 1994–95 and 2006–07, the last year of actual data. A further increase of 1 percent is expected between 2006–07 and 2019–20. Public schools are expected to have an increase in high school graduates, and private schools are expected to have a decrease. Increases are expected in the West and South, and decreases are expected in the Northeast and Midwest.

#### Factors affecting the projections

The projections of high school graduates are related to projections of 12th-graders and the historical relationship between the number of 12th-graders and the number of high school graduates. For more details, see appendixes A.0 and A.2.

#### About high school graduates

A high school graduate is defined as an individual who has received formal recognition from school authorities, by the granting of a diploma, for completing a prescribed course of study. This definition does not include other high school completers or high school equivalency recipients. Projected increases in the number of graduates reflect changes in the 18-year-old population over the projection period, rather than projected changes in the graduation rates of 12th-graders. Projections of graduates could be affected by changes in policies influencing graduation requirements.

### Accuracy of Projections

For NCES projections of public high school graduates produced over the last 18 years, the mean absolute percentage errors (MAPEs) for lead times of 1, 2, 5, and 10 years out were 1.0, 1.0, 1.7, and 3.8, respectively. For NCES projections of private high school graduates produced over the last 8 years, the MAPEs for lead times of 1, 2, and 5 years out were 0.9, 0.9, and 5.9, respectively. For more information, see table A-2 in appendix A.

# NATIONAL

The total number of high school graduates

- ▲ increased 27 percent between 1994–95 and 2006–07, a period of 12 years; and
- ▲ is projected to increase an additional 1 percent between 2006–07 and 2019–20, a period of 13 years.

The number of public high school graduates

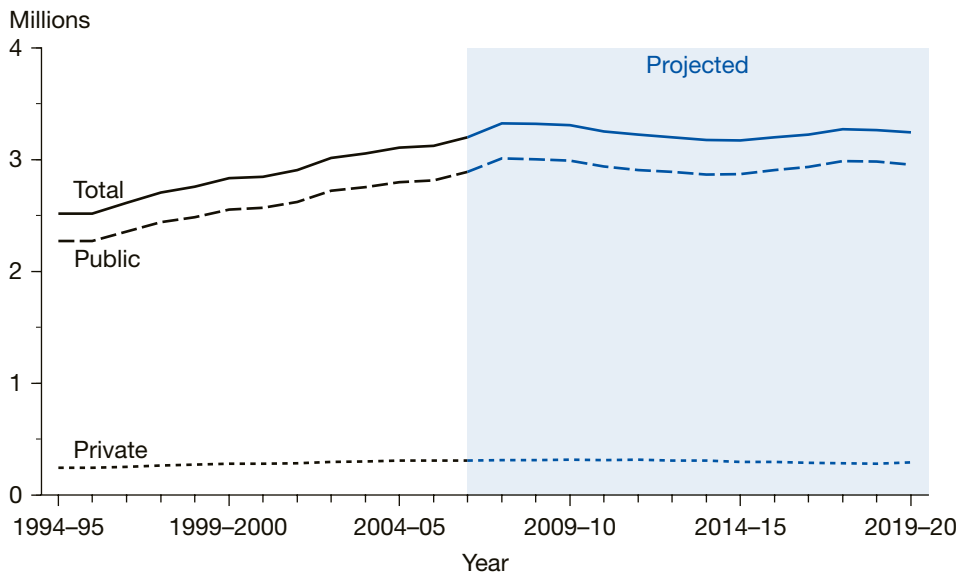
- ▲ increased 27 percent between 1994–95 and 2006–07; and
- ▲ is projected to increase an additional 2 percent between 2006–07 and 2019–20.

The number of private high school graduates

- ▲ increased 25 percent between 1994–95 and 2006–07; and
- ▼ is projected to decrease 4 percent between 2006–07 and 2019–20.

*For more information:  
Table 12*

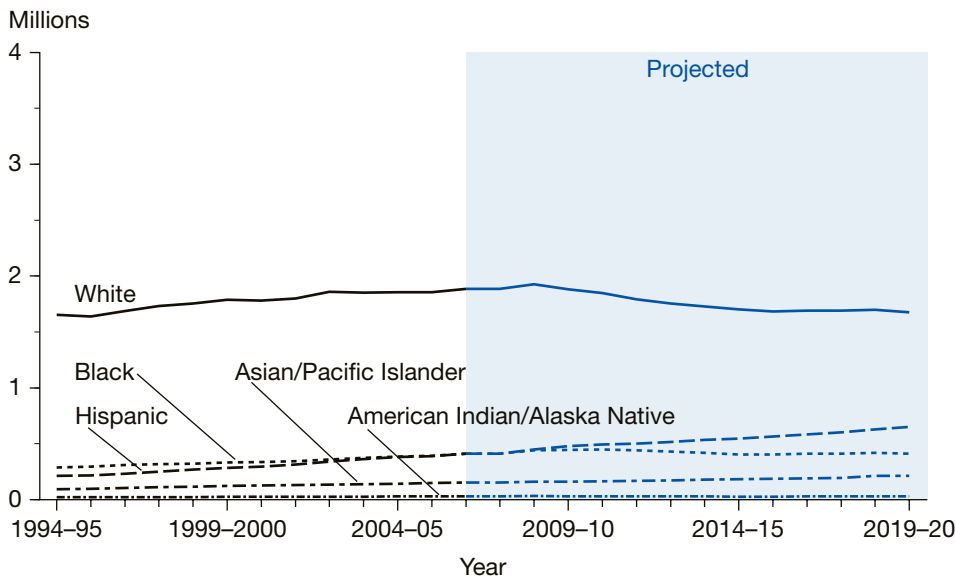
**Figure 6. Actual and projected numbers for high school graduates, by control of school: 1994–95 through 2019–20**



NOTE: Since the biennial Private School Universe Survey (PSS) is collected in the fall of odd numbered years, private school numbers for alternate years are estimated based on data from the PSS. Some data have been revised from previously published figures. Mean absolute percentage errors of selected education statistics can be found in table A-2, appendix A.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Common Core of Data (CCD), "State Nonfiscal Survey of Public Elementary/Secondary Education," 1994–95 through 2007–08; Private School Universe Survey (PSS), selected years, 1995–96 through 2007–08; and National Elementary and Secondary High School Graduates Enrollment Model, 1972–73 through 2006–07. (This figure was prepared April 2010.)

**Figure 7. Actual and projected numbers for public high school graduates, by race/ethnicity: 1994–95 through 2019–20**



NOTE: The historical racial/ethnic time series were constructed using racial/ethnic high school graduate data at the state level. In some instances, high school graduate data by race/ethnicity had to be imputed. Further, in some instances, the racial/ethnic data had to be adjusted in order for it to sum to the state total for high school graduates. For additional information, see the High School Graduates section of appendix A. Race categories exclude persons of Hispanic ethnicity. Mean absolute percentage errors of selected education statistics can be found in table A-2, appendix A. SOURCE: U.S. Department of Education, National Center for Education Statistics, Common Core of Data (CCD), “State Nonfiscal Survey of Public Elementary/Secondary Education,” 1995–96 through 2007–08; and National Public Elementary and Secondary High School Graduates by Race/Ethnicity Model, 1995–96 through 2007–08. (This figure was prepared April 2010.)

### High school graduates by race/ethnicity

Between 2006–07 and 2019–20, the number of public high school graduates is projected to

- ▼ decrease 13 percent for students who are White;
- ▼ decrease 2 percent for students who are Black;
- ▲ increase 60 percent for students who are Hispanic;
- ▲ increase 39 percent for students who are Asian or Pacific Islander; and
- ▼ decrease 2 percent for students who are American Indian or Alaska Native.

*For more information:  
Table 13*

## STATE AND REGIONAL (PUBLIC SCHOOL DATA)

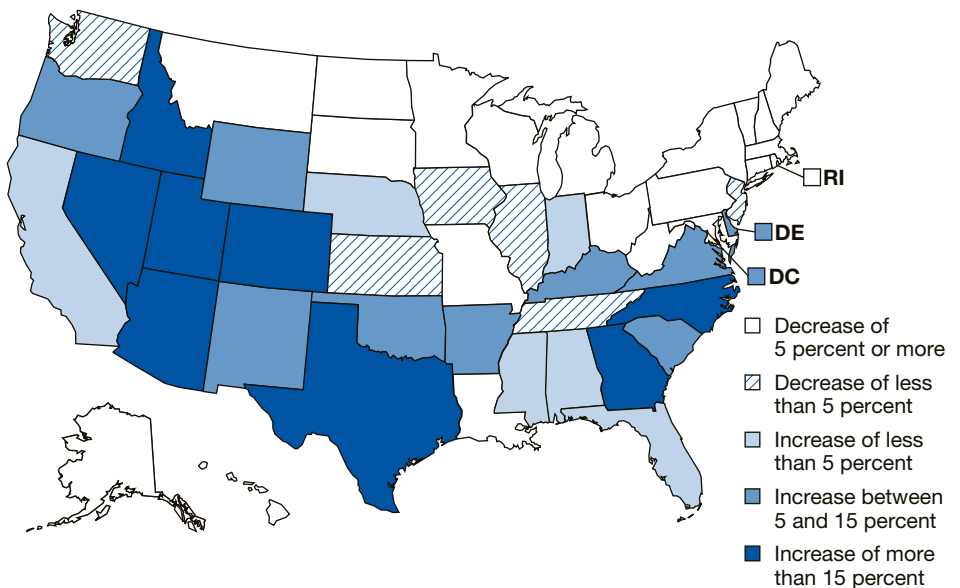
### High school graduates by state

The expected 2 percent national increase in public high school graduates between 2006–07 and 2019–20 plays out differently among the states.

- ▲ Increases are projected for 23 states and the District of Columbia, with
  - increases of more than 15 percent projected for 8 states;
  - increases between 5 and 15 percent projected for 9 states and the District of Columbia; and
  - increases of less than 5 percent projected for 6 states.
- ▼ Decreases are projected for 27 states, with
  - decreases of 5 percent or more projected for 21 states; and
  - decreases of less than 5 percent projected for 6 states.

*For more information:  
Tables 14 and 15*

**Figure 8. Projected percentage change in the number of public high school graduates, by state: 2006–07 through 2019–20**



NOTE: Calculations are based on unrounded numbers. Mean absolute percentage errors of selected education statistics can be found in table A-2, appendix A.  
SOURCE: U.S. Department of Education, National Center for Education Statistics, Common Core of Data (CCD), "State Nonfiscal Survey of Public Elementary/Secondary Education," 2007–08; and State Public High School Graduates Model, 1980–81 through 2006–07. (This figure was prepared April 2010.)

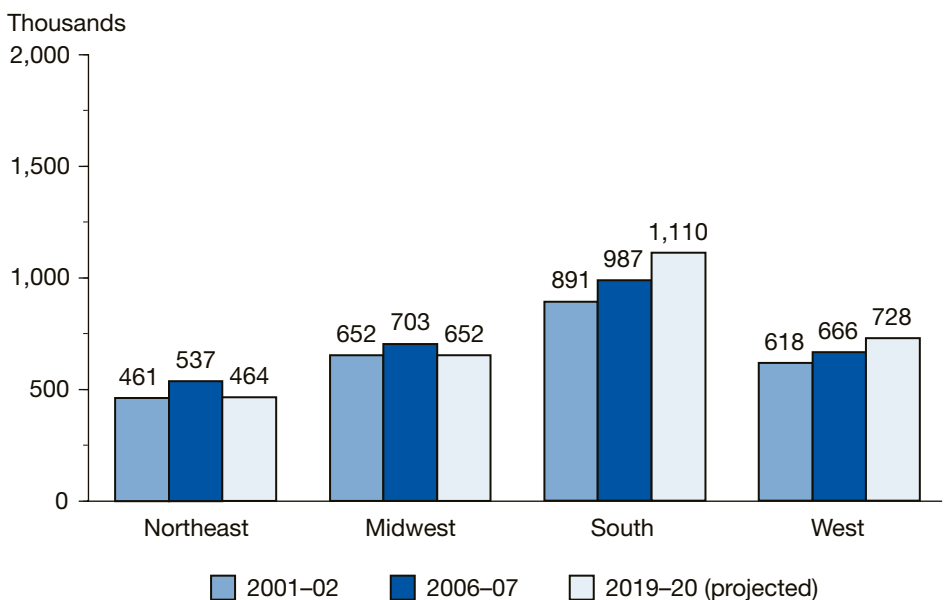
### High school graduates by region

Between 2006–07 and 2019–20, the number of public high school graduates is projected to

- ▼ decrease 14 percent in the Northeast;
- ▼ decrease 7 percent in the Midwest;
- ▲ increase 12 percent in the South; and
- ▲ increase 9 percent in the West.

*For more information:  
Tables 14 and 15*

**Figure 9. Actual and projected numbers for public high school graduates, by region: 2001–02, 2006–07, and 2019–20**



NOTE: See the glossary for a list of states in each region. Mean absolute percentage errors of selected education statistics can be found in table A-2, appendix A.  
SOURCE: U.S. Department of Education, National Center for Education Statistics, Common Core of Data (CCD), "State Nonfiscal Survey of Public Elementary/Secondary Education," 2002–03 and 2007–08; and State Public High School Graduates Model, 1980–81 through 2006–07. (This figure was prepared January 2010.)



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# Section 3

## *Elementary and Secondary Teachers*

### INTRODUCTION

Between fall 2007, the last year of actual public school data, and fall 2019, the number of teachers in elementary and secondary schools is projected to rise. The numbers of both public and private school teachers are projected to grow. The pupil/teacher ratios are projected to decrease in both public and private schools. The annual number of new teacher hires is projected to increase in both public and private schools.

#### **Factors affecting the projections**

The projections of the number of elementary and secondary teachers are related to projected levels of enrollments and education revenue receipts from state sources per capita. For more details, see appendixes A. 0 and A.3.

#### *Factors that were not considered*

The projections do not take into account possible changes in the number of teachers due to the effects of government policies.

#### *About pupil/teacher ratios*

The overall elementary and secondary pupil/teacher ratio and pupil/teacher ratios for public and private schools were computed based on elementary and secondary enrollment and the number of classroom teachers by control of school.

#### *About new teacher hires*

A teacher is considered to be a new teacher hire for a sector (public or private) for a given year if the teacher teaches in that sector that year but had not taught in that sector in the previous year. A teacher who moves from teaching in one sector to the other sector is considered a new teacher hire, but a teacher who moves from one school to another school in the same sector is not considered a new teacher hire. It is important to note that these projections measure the total number of teacher hires, including those hired to replace teachers retiring or leaving the teaching profession permanently or temporarily. Hence, the new teacher hire projections should not be interpreted as predicting teacher shortages.

### **Accuracy of Projections**

An analysis of projection errors from the past 19 editions of *Projections of Education Statistics* indicates that the mean absolute percentage errors (MAPEs) for projections of classroom teachers in public elementary and secondary schools were 1.0 percent for 1 year out, 1.4 percent for 2 years out, 3.0 percent for 5 years out, and 6.3 percent for 10 years out. For more information on the MAPEs of different NCES projection series, see table A-2 in appendix A.

# TEACHERS IN ELEMENTARY AND SECONDARY SCHOOLS

## Number of teachers

The total number of elementary and secondary teachers

- ▲ increased 24 percent between 1994 and 2007, a period of 13 years; and
- ▲ is projected to increase an additional 13 percent between 2007 and 2019, a period of 12 years.

The number of teachers in public elementary and secondary schools

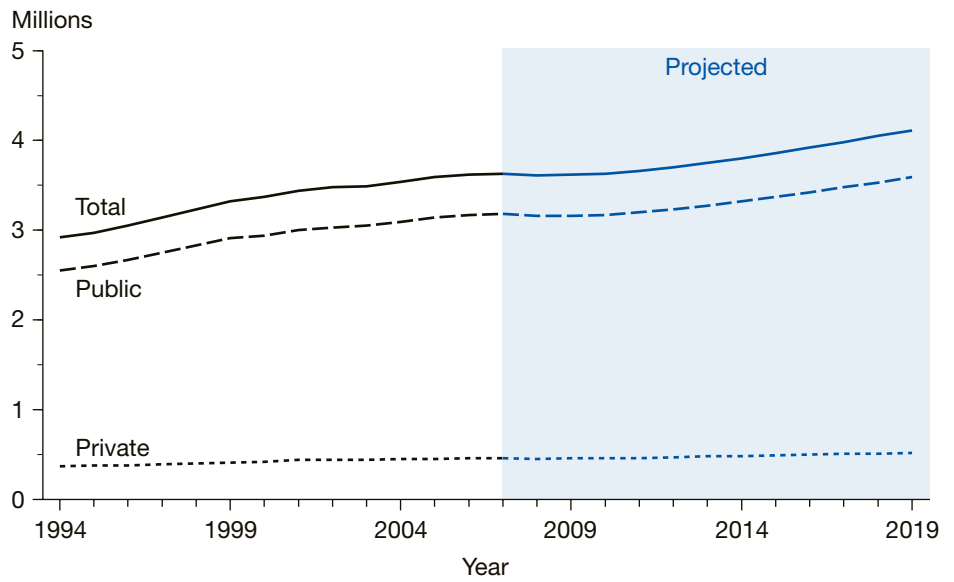
- ▲ increased 25 percent between 1994 and 2007; and
- ▲ is projected to increase an additional 13 percent between 2007 and 2019.

The number of teachers in private elementary and secondary schools

- ▲ increased 22 percent between 1994 and 2007; and
- ▲ is projected to increase an additional 14 percent between 2007 and 2019.

*For more information:  
Table 16*

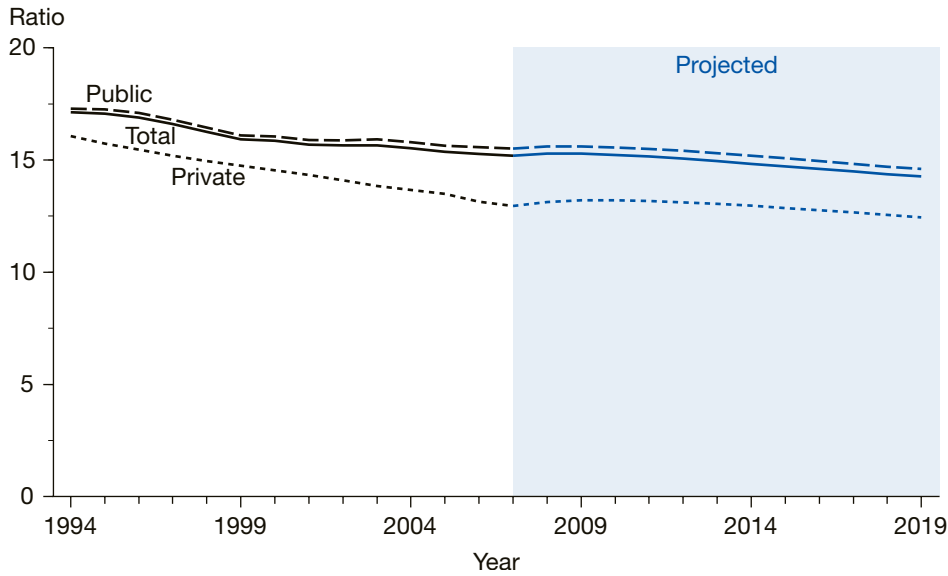
**Figure 10. Actual and projected numbers for elementary and secondary teachers, by control of school: Fall 1994 through fall 2019**



NOTE: Since the biennial Private School Universe Survey (PSS) is collected in the fall of odd numbered years, private school numbers for alternate years are estimated based on data from the PSS. Teachers reported in full-time equivalents. Some data have been revised from previously published figures. Mean absolute percentage errors of selected education statistics can be found in table A-2, appendix A.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Common Core of Data (CCD), "State Nonfiscal Survey of Public Elementary/Secondary Education," 1994-95 through 2007-08; Private School Universe Survey (PSS), selected years, 1995-96 through 2007-08; Elementary and Secondary Teacher Model, 1973-2006. (This figure was prepared April 2010.)

**Figure 11. Actual and projected numbers for the pupil/teacher ratios in elementary and secondary schools, by control of school: Fall 1994 through fall 2019**



NOTE: Since the biennial Private School Universe Survey (PSS) is collected in the fall of odd numbered years, private school numbers for alternate years are estimated based on data from the PSS. The pupil/teacher ratios were derived from tables 1 and 16. Teachers are reported in full-time equivalents. Some data have been revised from previously published figures. Mean absolute percentage errors of selected education statistics can be found in table A-2, appendix A. SOURCE: U.S. Department of Education, National Center for Education Statistics, Common Core of Data (CCD), "State Nonfiscal Survey of Public Elementary/Secondary Education," 1994–95 through 2007–08; Private School Universe Survey (PSS), selected years, 1995–96 through 2007–08; National Elementary and Secondary Enrollment Model, 1972–2007; and Elementary and Secondary Teacher Model, 1973–2006. (This figure was prepared April 2010.)

### Pupil/teacher ratios

The pupil/teacher ratio in elementary and secondary schools

- ▼ decreased from 17.1 to 15.2 between 1994 and 2007; and
- ▼ is projected to decrease further to 14.3 in 2019.

The pupil/teacher ratio in public elementary and secondary schools

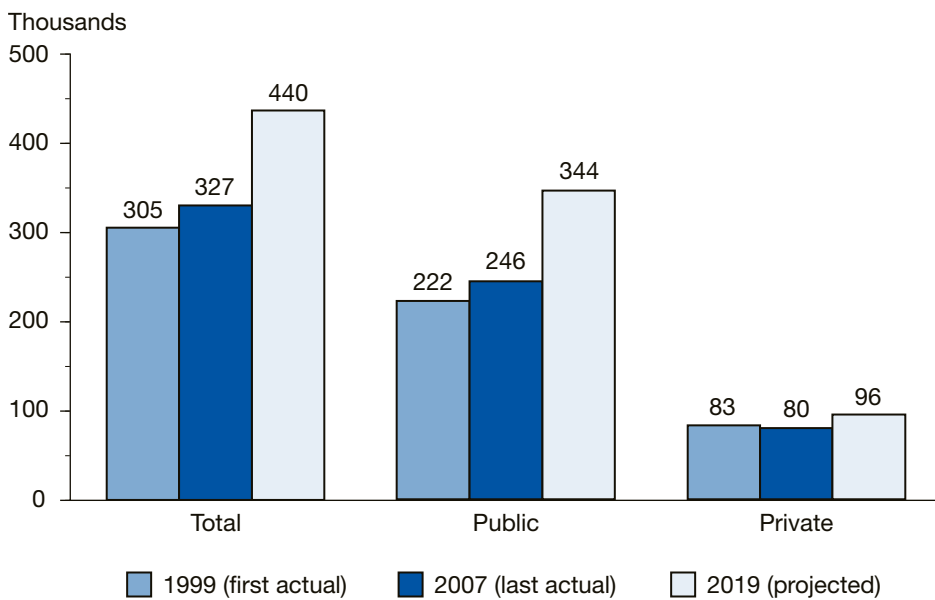
- ▼ decreased from 17.3 to 15.5 between 1994 and 2007; and
- ▼ is projected to decrease further to 14.6 in 2019.

The pupil/teacher ratio in private elementary and secondary schools

- ▼ decreased from 16.1 to 13.0 between 1994 and 2007; and
- ▼ is projected to decrease further to 12.4 in 2019.

*For more information:*  
Table 17

**Figure 12. Actual and alternative projected numbers for elementary and secondary new teacher hires, by control of school: Fall 1999, 2007, and 2019**



NOTE: Public and private new teacher hire numbers for 2007 are estimated using the New Teacher Hires Model. SOURCE: U.S. Department of Education, National Center for Education Statistics, Common Core of Data (CCD), "State Nonfiscal Survey of Public Elementary/Secondary Education," 1999–2000 and 2007–08; Private School Universe Survey (PSS), 1999–2000 and 2007–08; Elementary and Secondary Teacher Model, 1973–2006; and New Teacher Hires Model, 1988–2007. (This figure was prepared June 2010.)

### New teacher hires

Between 2007 and 2019, increases are expected in the annual numbers of new public school teacher hires and new private school teacher hires.

The number of new teacher hires in public schools

- was approximately 246,000 in 2007; and
- ▲ is projected to increase 40 percent to 344,000 in 2019.

The number of new teacher hires in private schools

- was approximately 80,000 in 2007; and
- ▲ is projected to increase 19 percent to 96,000 in 2017.

*For more information:*  
Table 16

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# Section 4

## *Expenditures for Public Elementary and Secondary Education*

### INTRODUCTION

Current expenditures for public elementary and secondary education are projected to increase in constant dollars between school years 2006–07, the last year of actual data, and 2019–20.

#### **Factors affecting the projections**

The projections of current expenditures are related to projections of economic growth as measured by disposable income per capita and assistance by state governments to local governments. For more details, see appendixes A.0 and A.4.

#### *Factors that were not considered*

Many factors that may affect future school expenditures were not considered in the production of these projections. Such factors include policy initiatives as well as potential changes in the distribution of elementary and secondary teachers as older teachers retire and are replaced by younger teachers.

#### *About constant dollars and current dollars*

Throughout this section, projections of current expenditures are presented in constant 2007–08 dollars. The reference tables, later in this report, present these data both in constant 2007–08 dollars and in current dollars. The projections were developed in constant dollars and then placed in current dollars using projections for the Consumer Price Index (CPI) (table B-6 in appendix B).

### **Accuracy of Projections**

An analysis of projection errors from similar models used in the past 19 editions of *Projections of Education Statistics* that contained expenditure projections indicates that mean absolute percentage errors (MAPEs) for total current expenditures in constant dollars were 1.2 percent for 1 year out, 2.1 percent for 2 years out, 2.7 percent for 5 years out, and 4.4 percent for 10 years out. MAPEs for current expenditures per pupil in fall enrollment in current dollars were 1.2 percent for 1 year out, 2.0 percent for 2 years out, 3.1 percent for 5 years out, and 5.8 percent for 10 years out. See appendix A for further discussion of the accuracy of recent projections of current expenditures, and see table A-2 in appendix A for the mean absolute percentage errors (MAPEs) of these projections.

## CURRENT EXPENDITURES

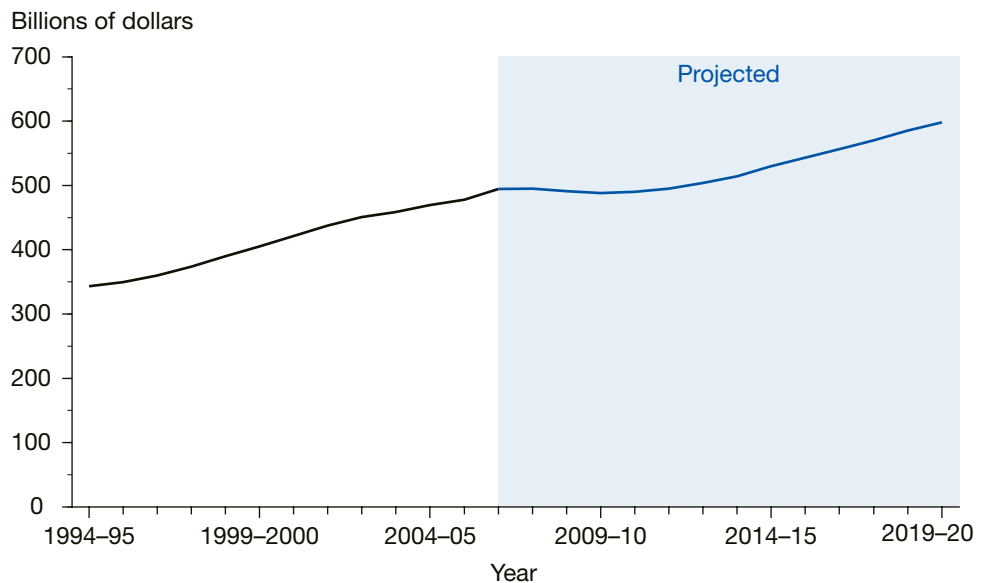
### Current expenditures

Current expenditures in constant 2007–08 dollars

- ▲ increased 44 percent from 1994–95 to 2006–07, a period of 12 years; and
- ▲ are projected to increase 21 percent, to \$598 billion, from 2006–07 to 2019–20, a period of 13 years.

*For more information:  
Tables 18 and 19*

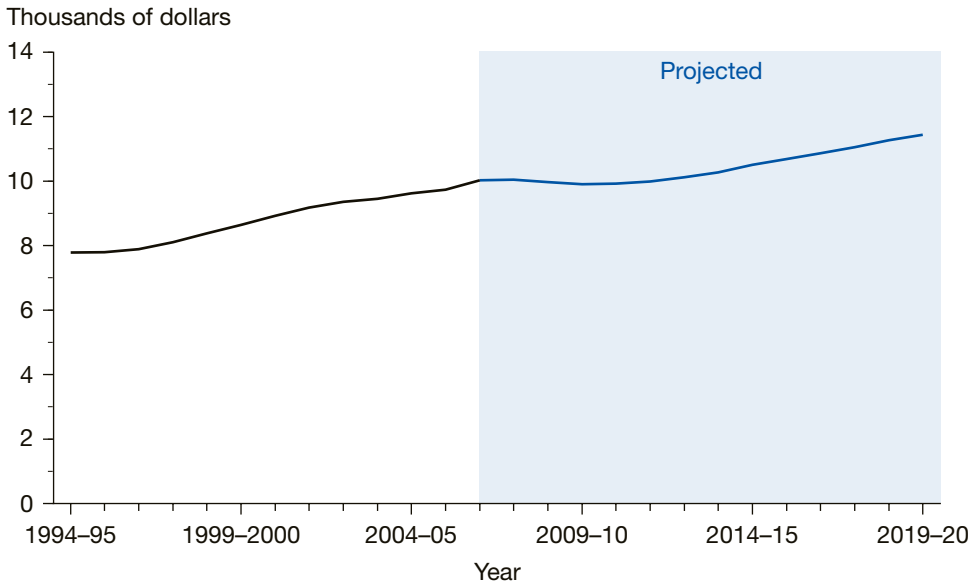
**Figure 13. Actual and projected current expenditures for public elementary and secondary schools (in constant 2007–08 dollars): 1994–95 through 2019–20**



NOTE: Numbers were placed in constant dollars using the Consumer Price Index (CPI) for all urban consumers, Bureau of Labor Statistics, U.S. Department of Labor. For more detail about CPI, see table B-6 in appendix B. Some data have been revised from previously published figures. Mean absolute percentage errors of selected education statistics can be found in table A-2, appendix A.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Common Core of Data (CCD), “National Public Education Financial Survey,” 1994–95 through 2006–07; Public Elementary and Secondary School Current Expenditures Model, 1969–70 through 2006–07. (This figure was prepared April 2010.)

**Figure 14. Actual and projected current expenditures per pupil in fall enrollment in public elementary and secondary schools (in constant 2007–08 dollars): 1994–95 through 2019–20**



NOTE: Numbers were placed in constant dollars using the Consumer Price Index (CPI) for all urban consumers, Bureau of Labor Statistics, U.S. Department of Labor. For more detail about CPI, see table B-6 in appendix B. Some data have been revised from previously published figures. Mean absolute percentage errors of selected education statistics can be found in table A-2, appendix A. SOURCE: U.S. Department of Education, National Center for Education Statistics, Common Core of Data (CCD), "State Nonfiscal Survey of Public Elementary/Secondary Education," 1994–95 through 2007–08; "National Public Education Financial Survey," 1994–95 through 2006–07; National Elementary and Secondary Enrollment Model, 1972–2007; and Public Elementary and Secondary School Current Expenditures Model, 1969–70 through 2006–07. (This figure was prepared April 2010.)

### Current expenditures per pupil

Current expenditures per pupil in fall enrollment in constant 2007–08 dollars

- ▲ increased 29 percent from 1994–95 to 2006–07; and
- ▲ are projected to increase 14 percent, to \$11,400, from 2006–07 to 2019–20.

*For more information:  
Tables 18 and 19*

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# Section 5

## Enrollment in Postsecondary Degree-Granting Institutions

### INTRODUCTION

Total enrollment in degree-granting institutions is expected to increase between fall 2008, the last year of actual data, and fall 2019. Degree-granting institutions are postsecondary institutions that provide study beyond secondary school and offer programs terminating in an associate's, baccalaureate, or higher degree and participate in federal financial aid programs. Differential growth is expected by student characteristics such as age, sex, and attendance status (part-time or full-time). Enrollment is expected to increase in both public and private degree-granting institutions.

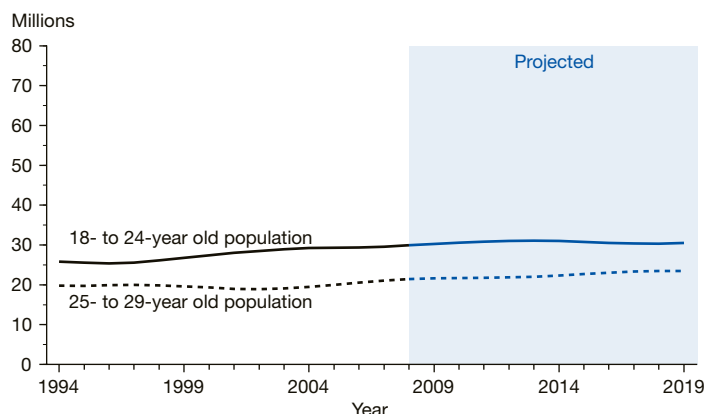
#### Factors affecting the projections

The projections of enrollment levels are related to projections of college-age populations, disposable income, and unemployment rates. For more details, see appendixes A.0 and A.5. An important factor is the expected increase in the population of 25- to 29-year-olds (table B-4 in appendix B).

#### Factors that were not considered

The enrollment projections do not take into account such factors as the cost of a college education, the economic value of an education, and the impact of distance learning due to technological changes. These factors may produce changes in enrollment levels. The racial/ethnic backgrounds of nonresident aliens are not known.

**Figure 15. Actual and projected population numbers for 18- to 24-year-olds and 25- to 29-year-olds: 1994 through 2019**



NOTE: Some data have been revised from previously published figures. Projections are from the U.S. Census Bureau's middle series. SOURCE: U.S. Department of Commerce, Census Bureau, Population Estimates, retrieved October 13, 2009, from <http://www.census.gov/popest/national/asrh/2008-nat-af.html>; and Population Projections, retrieved November 2, 2009, from <http://www.census.gov/population/www/projections/2008projections.html>. (This table was prepared April 2010.)

### Accuracy of Projections

For projections of total enrollment in degree-granting institutions, an analysis of projection errors based on the past nine editions of *Projections of Education Statistics* indicates that the mean absolute percentage errors (MAPEs) for lead times of 1, 2, 5, and 10 years out were 1.4, 2.4, 4.6, and 10.4 percent, respectively. For the 1-year-out prediction, this means that one would expect the projection to be within 1.4 percent of the actual value, on average. For more information, see table A-2 in appendix A.

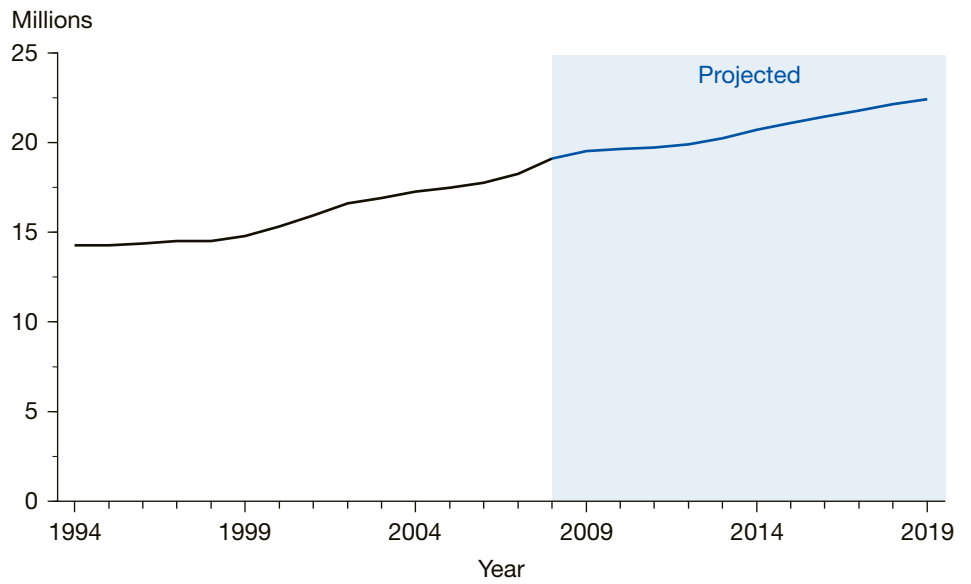
# TOTAL ENROLLMENT

## Total enrollment in degree-granting institutions

- ▲ increased 34 percent from 1994 to 2008, a period of 14 years; and
- ▲ is projected to increase 17 percent, to 22.4 million, from 2008 to 2019, a period of 11 years.

*For more information:  
Table 20*

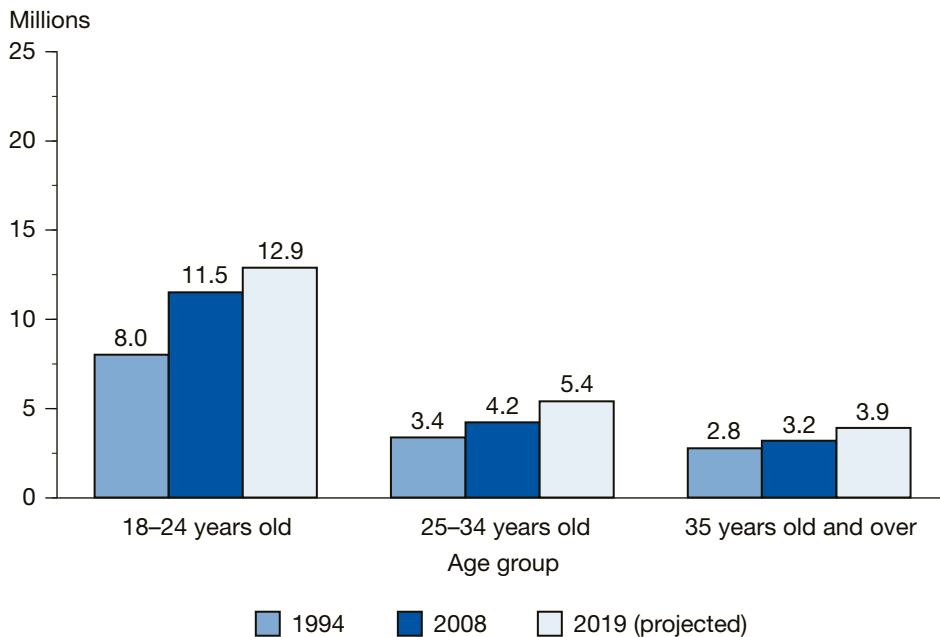
**Figure 16. Actual and projected numbers for total enrollment in all degree-granting institutions: Fall 1994 through fall 2019**



NOTE: Some data have been revised from previously published figures. Mean absolute percentage errors of selected education statistics can be found in table A-2, appendix A. SOURCE: U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System, "Fall Enrollment Survey" (IPEDS-EF:94-99), and Spring 2001 through Spring 2009; and Enrollment in Degree-Granting Institutions Model, 1973-2008. (This figure was prepared April 2010.)

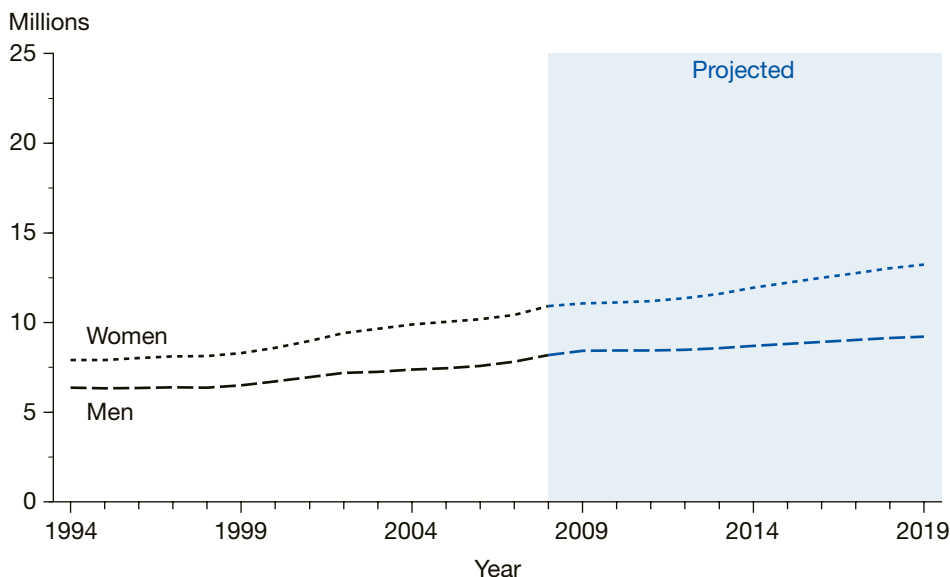
# ENROLLMENT BY SELECTED CHARACTERISTICS AND CONTROL OF INSTITUTION

**Figure 17. Actual and projected numbers for fall enrollment in all degree-granting institutions, by age group: Fall 1994, fall 2008, and fall 2019**



NOTE: Some data have been revised from previously published figures. Data by age are based on the distribution by age from the Census Bureau. Mean absolute percentage errors of selected education statistics can be found in table A-2, appendix A.  
 SOURCE: U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System, “Fall Enrollment Survey” (IPEDS-EF:94) and Spring 2009; Enrollment in Degree-Granting Institutions Model, 1973–2008; and U.S. Department of Commerce, Census Bureau, Current Population Reports, “Social and Economic Characteristics of Students,” various years. (This figure was prepared April 2010.)

**Figure 18. Actual and projected numbers for enrollment in all degree-granting institutions, by sex: Fall 1994 through fall 2019**



NOTE: Some data have been revised from previously published figures. Mean absolute percentage errors of selected education statistics can be found in table A-2, appendix A.  
 SOURCE: U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System, “Fall Enrollment Survey” (IPEDS-EF:94–99), and Spring 2001 through Spring 2009; and Enrollment in Degree-Granting Institutions Model, 1973–2008. (This figure was prepared April 2010.)

## Enrollment by age of student

Between 2008 and 2019, enrollment is projected to increase

- ▲ 12 percent for students who are 18 to 24 years old;
- ▲ 28 percent for students who are 25 to 34 years old; and
- ▲ 22 percent for students who are 35 years old and over.

*For more information:*  
 Table 21

## Enrollment by sex of student

Between 2008 and 2019, enrollment is projected to increase

- ▲ 12 percent for men; and
- ▲ 21 percent for women.

*For more information:*  
 Tables 20–26

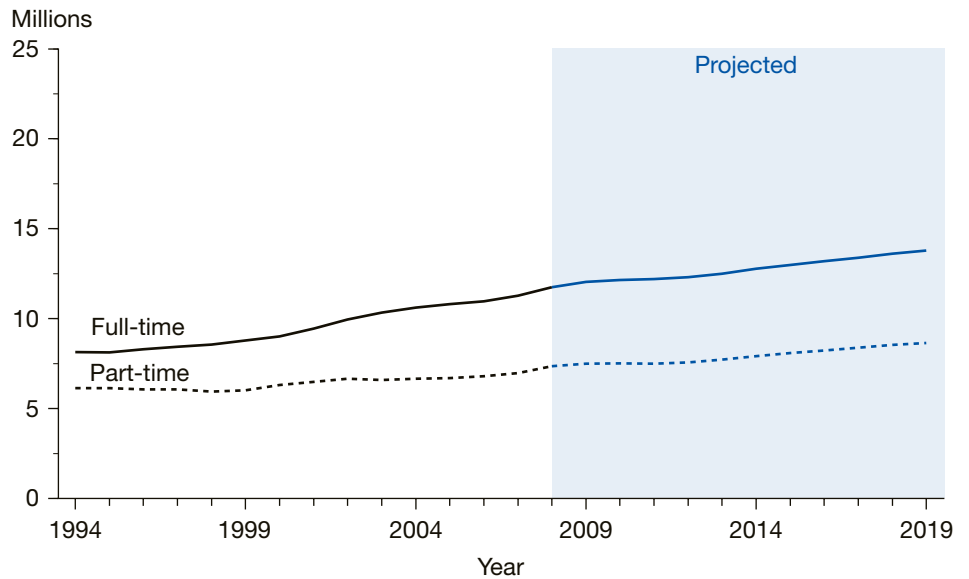
## Enrollment by attendance status

Between 2008 and 2019, enrollment is projected to increase

- ▲ 17 percent for full-time students; and
- ▲ 17 percent for part-time students.

*For more information:  
Tables 20–27*

**Figure 19. Actual and projected numbers for enrollment in all degree-granting institutions, by attendance status: Fall 1994 through fall 2019**



NOTE: Some data have been revised from previously published figures. Mean absolute percentage errors of selected education statistics can be found in table A-2, appendix A. SOURCE: U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System, “Fall Enrollment Survey” (IPEDS-EF:94–99), and Spring 2001 through Spring 2009; and Enrollment in Degree-Granting Institutions Model, 1973–2008. (This figure was prepared April 2010.)

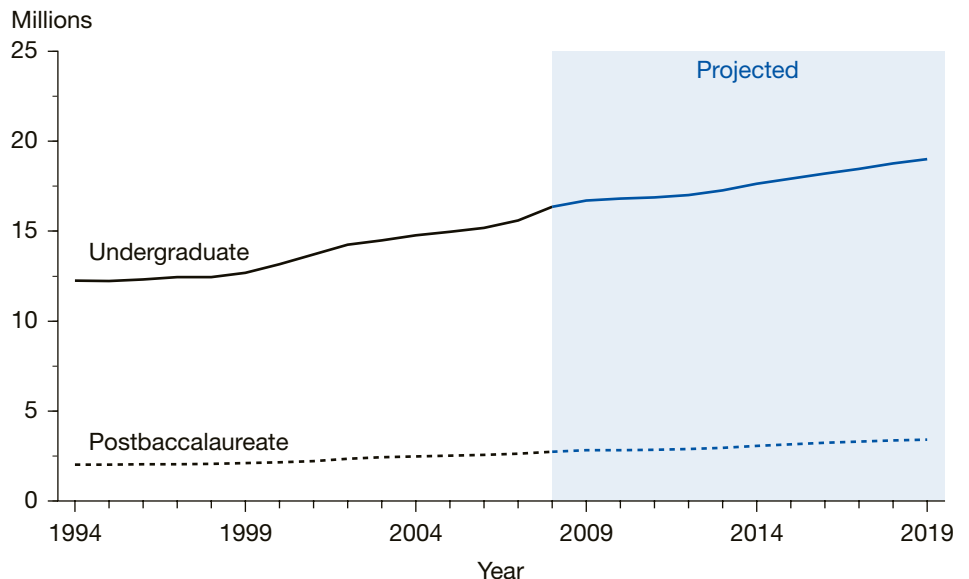
## Enrollment by level of student

Between 2008 and 2019, enrollment is projected to increase

- ▲ 16 percent for undergraduate students; and
- ▲ 25 percent for postbaccalaureate students.

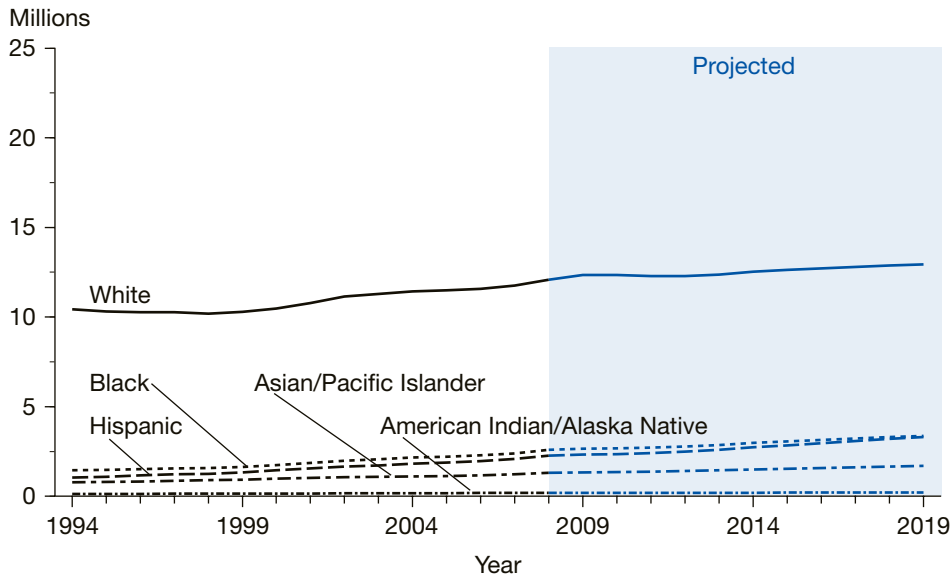
*For more information:  
Tables 27–28*

**Figure 20. Actual and projected numbers for undergraduate and postbaccalaureate enrollment in all degree-granting institutions: Fall 1994 through fall 2019**



NOTE: Some data have been revised from previously published figures. Mean absolute percentage errors of selected education statistics can be found in table A-2, appendix A. SOURCE: U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System, “Fall Enrollment Survey” (IPEDS-EF:94–99), and Spring 2001 through Spring 2009; and Enrollment in Degree-Granting Institutions Model, 1973–2008. (This figure was prepared April 2010.)

**Figure 21. Actual and projected numbers for enrollment in all degree-granting institutions, by race/ethnicity: Fall 1994 through fall 2019**



NOTE: Race categories exclude persons of Hispanic ethnicity. Enrollment data in the “racial/ethnicity unknown” category of the IPEDS “Fall Enrollment Survey” have been prorated to the other racial/ethnicity categories at the institutional level. Mean absolute percentage errors of selected education statistics can be found in table A-2, appendix A.  
 SOURCE: U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System, “Fall Enrollment Survey” (IPEDS-EF:94–99), and Spring 2001 through Spring 2009; and Enrollment in Degree-Granting Institutions by Race/Ethnicity Model, 1980–2008. (This figure was prepared April 2010.)

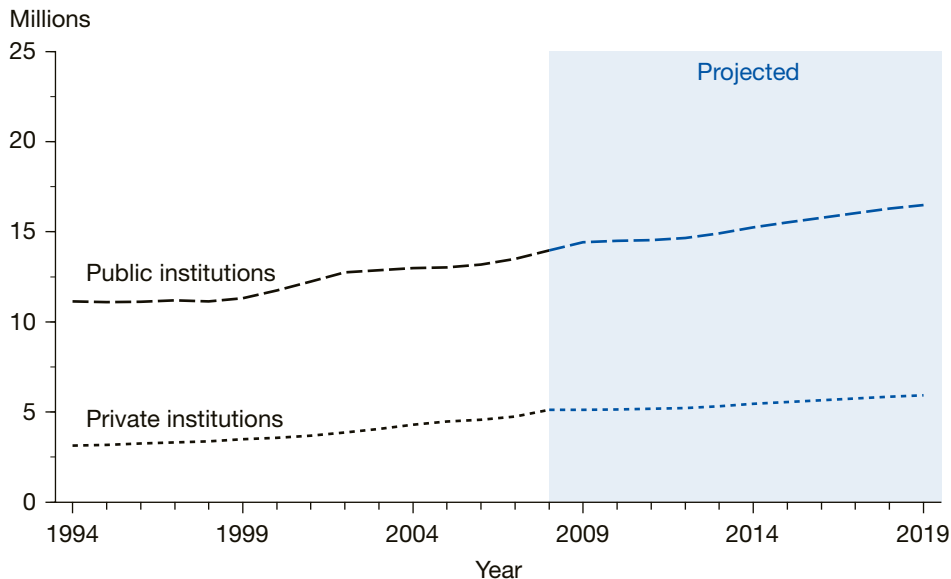
### Enrollment by race/ethnicity

Between 2008 and 2019, enrollment is projected to increase

- ▲ 7 percent for students who are White;
- ▲ 30 percent for students who are Black;
- ▲ 45 percent for students who are Hispanic;
- ▲ 30 percent for students who are Asian or Pacific Islander; and
- ▲ 5 percent for students who are American Indian or Alaska Native.

*For more information:*  
 Table 29

**Figure 22. Actual and projected numbers for enrollment in all degree-granting institutions, by control of institution: Fall 1994 through fall 2019**



NOTE: Some data have been revised from previously published figures. Mean absolute percentage errors of selected education statistics can be found in table A-2, appendix A.  
 SOURCE: U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System, “Fall Enrollment Survey” (IPEDS-EF:94–99), and Spring 2001 through Spring 2009; Enrollment in Degree-Granting Institutions Model, 1980–2008. (This figure was prepared April 2010.)

### Enrollment in public and private institutions

Between 2008 and 2019, enrollment is projected to increase

- ▲ 18 percent in public institutions; and
- ▲ 15 percent in private institutions.

*For more information:*  
 Table 20

## FIRST-TIME FRESHMEN ENROLLMENT

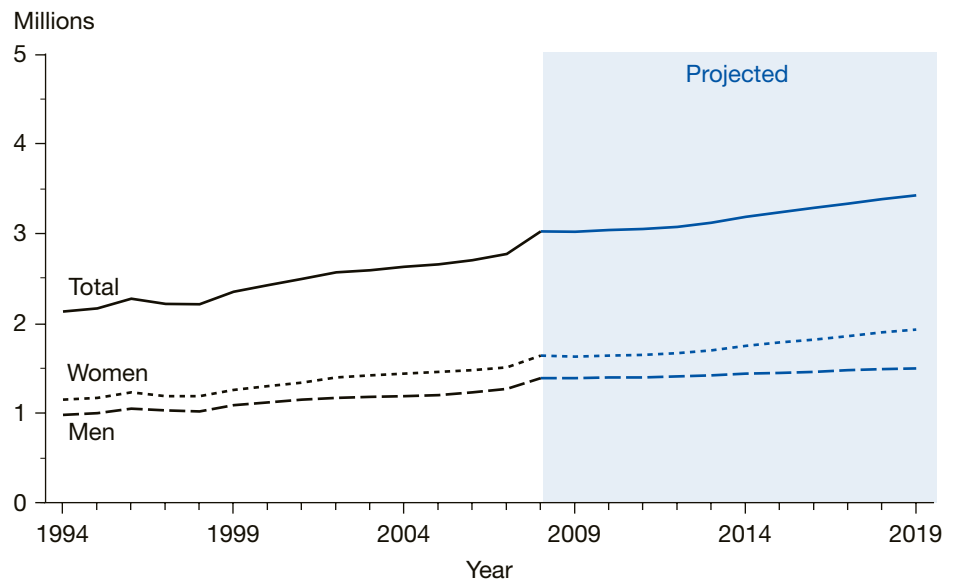
Total first-time freshmen enrollment in degree-granting institutions increased 42 percent from 1994 to 2008.

Between 2008 and 2019, first-time freshmen enrollment is projected to increase

- ▲ 13 percent overall;
- ▲ 8 percent for men; and
- ▲ 18 percent for women.

*For more information:  
Table 20*

**Figure 23. Actual and projected numbers for total first-time freshmen enrollment in all degree-granting institutions, by sex: Fall 1994 through fall 2019**



NOTE: Some data have been revised from previously published figures. Mean absolute percentage errors of selected education statistics can be found in table A-2, appendix A. SOURCE: U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System, "Fall Enrollment Survey" (IPEDS-EF:94-99), and Spring 2001 through Spring 2009; Enrollment in Degree-Granting Institutions Model, 1973-2008; and First-Time Freshmen Model, 1975-2008. (This table was prepared April 2010.)

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# Section 6

## *Postsecondary Degrees Conferred*

### INTRODUCTION

Continuing growth in enrollment in degree-granting institutions has been reflected by an increase in the number of degrees conferred. Increases in the number of degrees conferred are expected to continue between academic year 2007–08, the last year of actual data, and academic year 2019–20.

#### Factors affecting the projections

The projections of the number of degrees conferred are related to projections of the college-age populations developed by the Census Bureau and college enrollments from this report. For more details, see appendixes A.0 and A.6.

#### *Factors that were not considered*

Some factors that may affect future numbers of degrees, such as choice of degree and labor force requirements, were not included in the projection models.

#### *About first-professional degrees*

A first-professional degree is one that signifies both completion of the academic requirements for beginning practice in a given profession and a level of professional skill beyond that required for a bachelor's degree. A first-professional degree is based on a program requiring at least 2 academic years of work beyond the bachelor's degree. Degree fields include dentistry, medicine, optometry, osteopathic medicine, pharmacy, podiatric medicine, veterinary medicine, chiropractic, law, and theological professions.

### Accuracy of Projections

An analysis of projection errors from the past 13 editions of *Projections of Education Statistics* indicates that the mean absolute percentage errors (MAPEs) for associate's degree projections were 2.0 percent for 1 year out, 3.4 percent for 2 years out, 6.2 percent for 5 years out, and 16.2 percent for 10 years out. The MAPEs for bachelor's degree projections were 0.8, 1.8, 5.9, and 13.6 percent, respectively, for lead times of 1, 2, 5, and 10 years out. The MAPEs for master's degrees were 1.5, 3.3, 11.2, and 25.1 percent, respectively. For doctor's degrees, the MAPEs were 3.4, 5.6, 7.8, and 13.9 percent, respectively. For first-professional degrees, the MAPEs were 1.2, 1.6, 4.6, and 12.6 percent, respectively. For more information on the MAPEs of different NCES projection series, see table A-2 in appendix A.

## DEGREES, BY LEVEL OF DEGREE AND SEX OF RECIPIENT

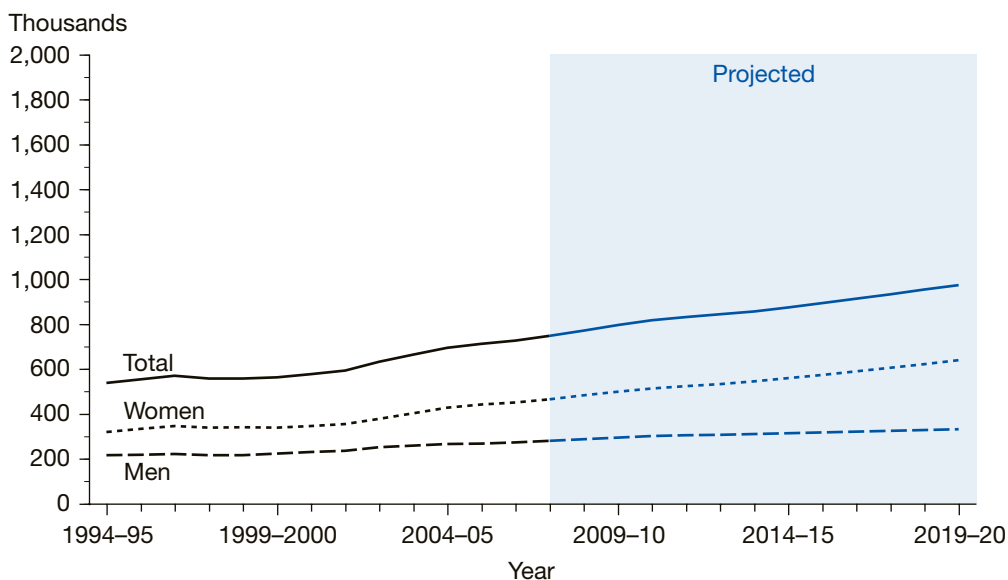
### Associate's degrees

Between 2007–08 and 2019–20, the number of associate's degrees is projected to increase

- ▲ 30 percent overall;
- ▲ 18 percent for men; and
- ▲ 37 percent for women.

*For more information:  
Table 31*

**Figure 24. Actual and projected numbers for associate's degrees by degree-granting institutions, by sex of recipient: 1994–95 through 2019–20**



NOTE: Some data have been revised from previously published figures. Mean absolute percentage errors of selected education statistics can be found in table A-2, appendix A. SOURCE: U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System, "Completions Survey" (IPEDS-C:95–99), and Fall 2000 through Fall 2008; and Degrees Conferred Model, 1975–76 through 2007–08. (This figure was prepared April 2010.)

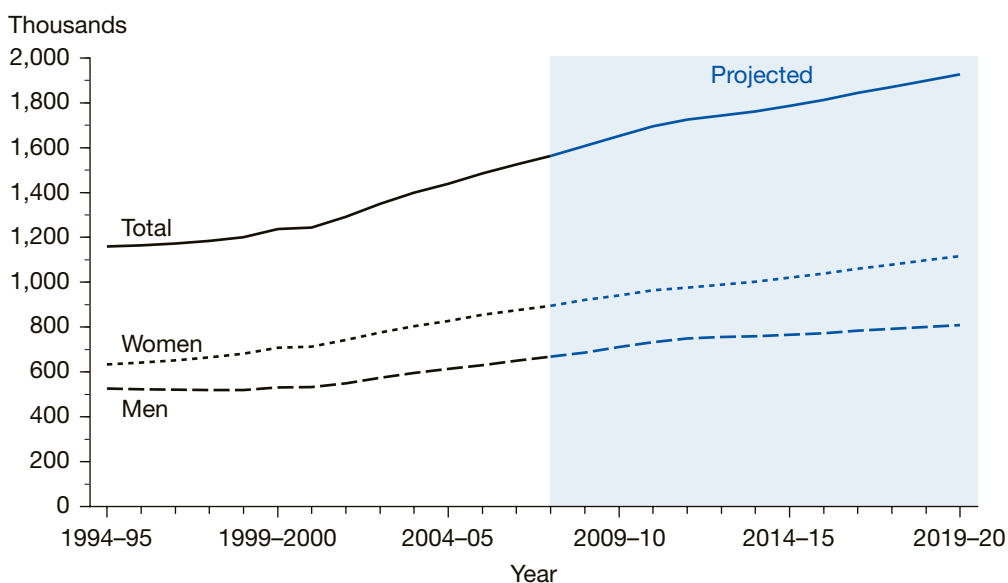
### Bachelor's degrees

Between 2007–08 and 2019–20, the number of bachelor's degrees is projected to increase

- ▲ 23 percent overall;
- ▲ 21 percent for men; and
- ▲ 25 percent for women.

*For more information:  
Table 32*

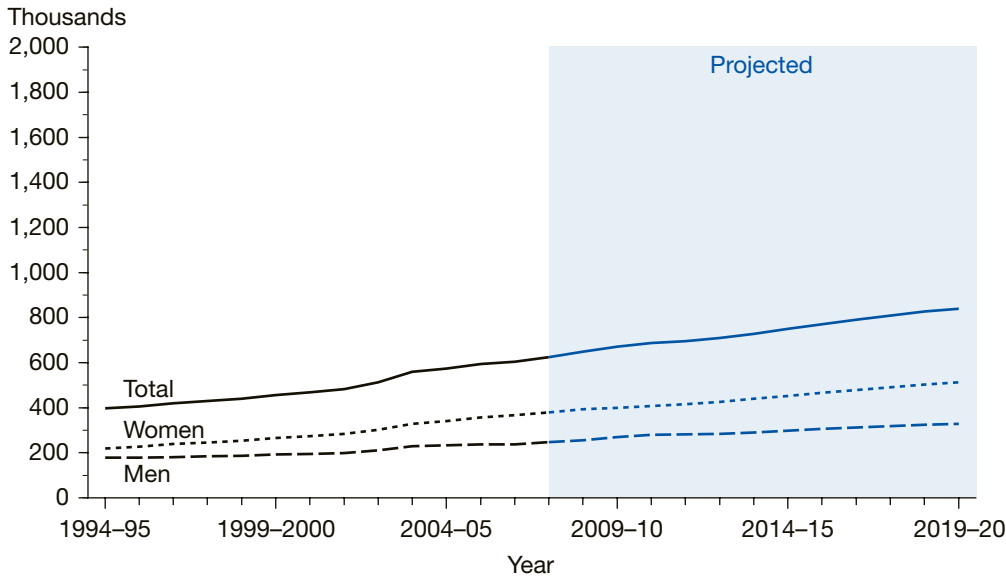
**Figure 25. Actual and projected numbers for bachelor's degrees by degree-granting institutions, by sex of recipient: 1994–95 through 2019–20**



NOTE: Some data have been revised from previously published figures. Mean absolute percentage errors of selected education statistics can be found in table A-2, appendix A. SOURCE: U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System, "Completions Survey" (IPEDS-C:95–99), and Fall 2000 through Fall 2008; and Degrees Conferred Model, 1975–76 through 2007–08. (This figure was prepared April 2010.)



**Figure 26. Actual and projected numbers for master's degrees by degree-granting institutions, by sex of recipient: 1994–95 through 2019–20**



NOTE: Some data have been revised from previously published figures. Mean absolute percentage errors of selected education statistics can be found in table A-2, appendix A. SOURCE: U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System, "Completions Survey" (IPEDS-C:95-99), and Fall 2000 through Fall 2008; and Degrees Conferred Model, 1975-76 through 2007-08. (This figure was prepared April 2010.)

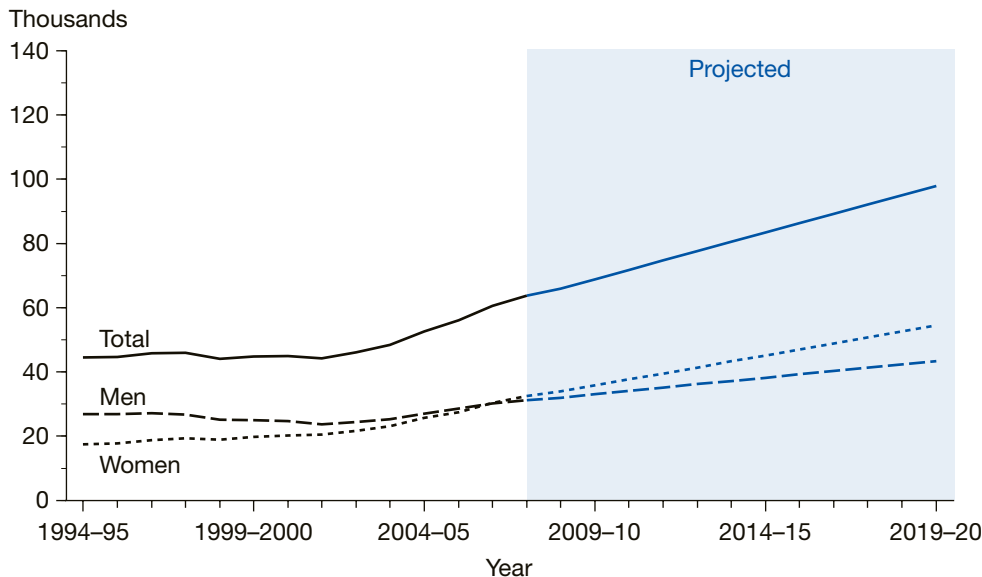
## Master's degrees

Between 2007–08 and 2019–20, the number of master's degrees is projected to increase

- ▲ 34 percent overall;
- ▲ 33 percent for men; and
- ▲ 35 percent for women.

*For more information:*  
*Table 33*

**Figure 27. Actual and projected numbers for doctor's degrees by degree-granting institutions, by sex of recipient: 1994–95 through 2019–20**



NOTE: Some data have been revised from previously published figures. Mean absolute percentage errors of selected education statistics can be found in table A-2, appendix A. SOURCE: U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System, "Completions Survey" (IPEDS-C:95-99), and Fall 2000 through Fall 2008; and Degrees Conferred Model, 1975-76 through 2007-08. (This figure was prepared April 2010.)

## Doctor's degrees

Between 2007–08 and 2019–20, the number of doctor's degrees is projected to increase

- ▲ 54 percent overall;
- ▲ 39 percent for men; and
- ▲ 68 percent for women.

*For more information:*  
*Table 34*

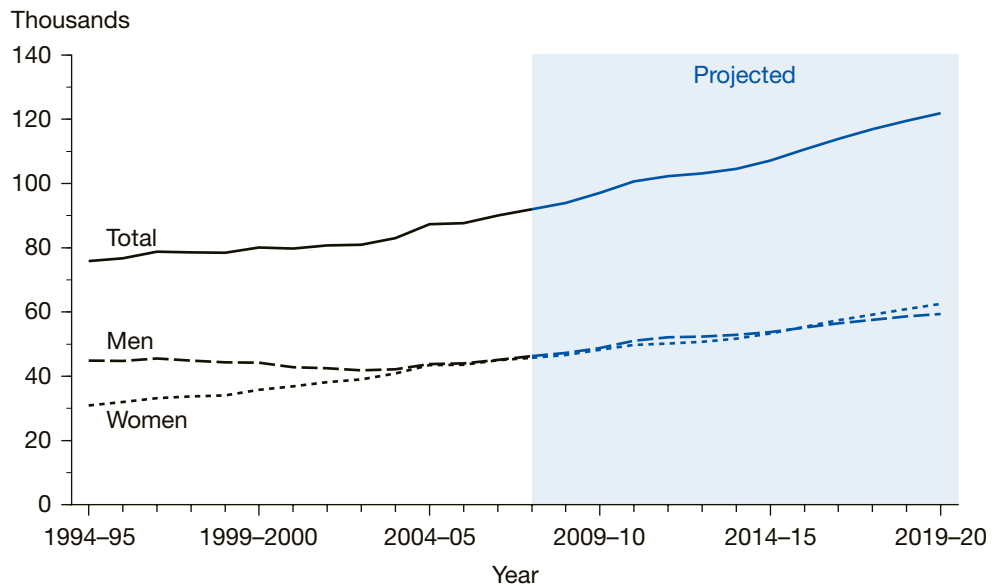
## First-professional degrees

Between 2007–08 and 2019–20, the number of first-professional degrees is projected to increase

- ▲ 34 percent overall;
- ▲ 29 percent for men; and
- ▲ 38 percent for women.

*For more information:  
Table 35*

**Figure 28. Actual and projected numbers for first-professional degrees by degree-granting institutions, by sex of recipient: 1994–95 through 2019–20**



NOTE: Some data have been revised from previously published figures. Mean absolute percentage errors of selected education statistics can be found in table A-2, appendix A. SOURCE: U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System, “Completions Survey” (IPEDS-C:95–99), and Fall 2000 through Fall 2008; and Degrees Conferred Model, 1975–76 through 2007–08. (This figure was prepared April 2010.)

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# Reference Tables

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**Table 1. Actual and projected numbers for enrollment in grades PK–12, PK–8, and 9–12 in elementary and secondary schools, by control of school: Fall 1994 through fall 2019**

[In thousands]

Year	Total			Public			Private		
	PK–12 <sup>1</sup>	PK–8 <sup>1</sup>	9–12	PK–12	PK–8	9–12	PK–12 <sup>1</sup>	PK–8 <sup>1</sup>	9–12
<b>Actual</b>									
1994 <sup>2</sup>	50,106	36,752	13,354	44,111	31,896	12,215	5,994	4,856	1,138
1995	50,759	37,094	13,665	44,840	32,338	12,502	5,918	4,756	1,163
1996 <sup>2</sup>	51,544	37,517	14,027	45,611	32,762	12,849	5,933	4,755	1,178
1997	52,071	37,830	14,241	46,127	33,071	13,056	5,944	4,759	1,185
1998 <sup>2</sup>	52,526	38,119	14,407	46,539	33,344	13,195	5,988	4,776	1,212
1999	52,875	38,275	14,600	46,857	33,486	13,371	6,018	4,789	1,229
2000 <sup>2</sup>	53,373	38,592	14,781	47,204	33,686	13,517	6,169	4,906	1,264
2001	53,992	38,959	15,032	47,672	33,936	13,736	6,320	5,023	1,296
2002 <sup>2</sup>	54,403	39,029	15,374	48,183	34,114	14,069	6,220	4,915	1,306
2003	54,639	38,989	15,651	48,540	34,201	14,339	6,099	4,788	1,311
2004 <sup>2</sup>	54,882	38,933	15,949	48,795	34,178	14,618	6,087	4,756	1,331
2005	55,187	38,928	16,258	49,113	34,204	14,909	6,073	4,724	1,349
2006 <sup>2</sup>	55,307	38,866	16,441	49,316	34,235	15,081	5,991	4,631	1,360
2007	55,203	38,751	16,451	49,293	34,205	15,087	5,910	4,546	1,364
<b>Projected</b>									
2008	55,234	38,890	16,345	49,265	34,316	14,949	5,969	4,574	1,395
2009	55,282	39,086	16,196	49,312	34,505	14,807	5,970	4,580	1,389
2010	55,350	39,312	16,038	49,386	34,730	14,657	5,964	4,582	1,382
2011	55,515	39,572	15,943	49,554	34,974	14,580	5,961	4,598	1,363
2012	55,757	39,828	15,929	49,795	35,206	14,589	5,962	4,622	1,340
2013	56,063	40,094	15,969	50,088	35,437	14,651	5,975	4,657	1,318
2014	56,442	40,338	16,104	50,446	35,636	14,810	5,995	4,702	1,294
2015	56,859	40,637	16,221	50,827	35,881	14,946	6,031	4,757	1,275
2016	57,273	41,006	16,267	51,198	36,205	14,993	6,075	4,801	1,274
2017	57,709	41,369	16,340	51,583	36,526	15,058	6,126	4,844	1,282
2018	58,129	41,723	16,407	51,946	36,838	15,108	6,184	4,885	1,298
2019	58,590	42,083	16,507	52,342	37,156	15,186	6,248	4,927	1,321

<sup>1</sup> Includes private nursery and prekindergarten enrollment in schools that offer kindergarten or higher grades.

<sup>2</sup> Since the biennial Private School Universe Survey (PSS) is collected in the fall of odd-numbered years, private school numbers for alternate years are estimated based on data from the PSS.

NOTE: PK = prekindergarten. Some data have been revised from previously published figures. Detail may not sum to totals because of rounding. Mean absolute percentage errors of selected education statistics can be found in table A-2, appendix A.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Common Core of Data (CCD), "State Nonfiscal Survey of Public Elementary/Secondary Education," 1994–95 through 2007–08; Private School Universe Survey (PSS), selected years 1995–96 through 2007–08; and National Elementary and Secondary Enrollment Model, 1972–2007. (This table was prepared January 2010.)

**Table 2. Actual and projected numbers for enrollment in public elementary and secondary schools, by grade: Fall 1994 through fall 2019**

[In thousands]

Year	Total	Grade							
		PK	K	1	2	3	4	5	6
<b>Actual</b>									
1994	44,111	603	3,444	3,593	3,440	3,439	3,426	3,372	3,381
1995	44,840	637	3,536	3,671	3,507	3,445	3,431	3,438	3,395
1996	45,611	670	3,532	3,770	3,600	3,524	3,454	3,453	3,494
1997	46,127	695	3,503	3,755	3,689	3,597	3,507	3,458	3,492
1998	46,539	729	3,443	3,727	3,681	3,696	3,592	3,520	3,497
1999	46,857	751	3,397	3,684	3,656	3,691	3,686	3,604	3,564
2000	47,204	776	3,382	3,636	3,634	3,676	3,711	3,707	3,663
2001	47,672	865	3,379	3,614	3,593	3,653	3,695	3,727	3,769
2002	48,183	915	3,434	3,594	3,565	3,623	3,669	3,711	3,788
2003	48,540	950	3,503	3,613	3,544	3,611	3,619	3,685	3,772
2004	48,795	990	3,544	3,663	3,560	3,580	3,612	3,635	3,735
2005	49,113	1,036	3,619	3,691	3,606	3,586	3,578	3,633	3,670
2006	49,316	1,084	3,631	3,751	3,641	3,627	3,586	3,602	3,660
2007	49,293	1,081	3,609	3,750	3,704	3,659	3,624	3,600	3,628
<b>Projected</b>									
2008	49,265	1,093	3,650	3,711	3,699	3,728	3,658	3,643	3,634
2009	49,312	1,109	3,703	3,752	3,660	3,723	3,727	3,676	3,677
2010	49,386	1,117	3,728	3,795	3,701	3,684	3,722	3,746	3,711
2011	49,554	1,124	3,752	3,820	3,743	3,725	3,683	3,741	3,781
2012	49,795	1,132	3,779	3,845	3,768	3,767	3,724	3,701	3,776
2013	50,088	1,142	3,812	3,874	3,792	3,792	3,766	3,742	3,736
2014	50,446	1,153	3,848	3,907	3,821	3,817	3,792	3,785	3,778
2015	50,827	1,164	3,886	3,944	3,854	3,845	3,816	3,811	3,820
2016	51,198	1,175	3,924	3,984	3,891	3,879	3,844	3,835	3,846
2017	51,583	1,186	3,961	4,023	3,929	3,916	3,878	3,864	3,871
2018	51,946	1,197	3,995	4,061	3,968	3,955	3,915	3,897	3,900
2019	52,342	1,206	4,027	4,096	4,005	3,994	3,954	3,934	3,934

See notes at end of table.

**Table 2. Actual and projected numbers for enrollment in public elementary and secondary schools, by grade: Fall 1994 through fall 2019—Continued**

Year	Grade						Elementary ungraded	Secondary ungraded
	7	8	9	10	11	12		
[In thousands]								
<b>Actual</b>								
1994	3,404	3,302	3,604	3,131	2,748	2,488	492	244
1995	3,422	3,356	3,704	3,237	2,826	2,487	500	247
1996	3,464	3,403	3,801	3,323	2,930	2,586	399	208
1997	3,520	3,415	3,819	3,376	2,972	2,673	440	216
1998	3,530	3,480	3,856	3,382	3,021	2,722	449	214
1999	3,541	3,497	3,935	3,415	3,034	2,782	415	205
2000	3,629	3,538	3,963	3,491	3,083	2,803	334	177
2001	3,720	3,616	4,012	3,528	3,174	2,863	304	159
2002	3,821	3,709	4,105	3,584	3,229	2,990	285	161
2003	3,841	3,809	4,190	3,675	3,277	3,046	255	150
2004	3,818	3,825	4,281	3,750	3,369	3,094	215	122
2005	3,777	3,802	4,287	3,866	3,454	3,180	205	121
2006	3,716	3,766	4,260	3,882	3,551	3,277	170	110
2007	3,701	3,709	4,200	3,863	3,558	3,375	139	92
<b>Projected</b>								
2008	3,672	3,690	4,155	3,793	3,542	3,368	139	91
2009	3,677	3,661	4,134	3,753	3,478	3,353	139	90
2010	3,721	3,667	4,101	3,733	3,441	3,292	141	89
2011	3,755	3,710	4,107	3,704	3,423	3,257	142	89
2012	3,826	3,744	4,156	3,710	3,396	3,240	143	88
2013	3,821	3,815	4,194	3,753	3,401	3,215	145	88
2014	3,781	3,810	4,274	3,788	3,441	3,219	147	88
2015	3,823	3,769	4,268	3,860	3,473	3,257	148	89
2016	3,866	3,812	4,223	3,854	3,539	3,288	149	90
2017	3,892	3,855	4,270	3,814	3,534	3,350	150	91
2018	3,917	3,881	4,318	3,856	3,497	3,345	152	92
2019	3,947	3,906	4,348	3,900	3,536	3,310	153	93

NOTE: PK = prekindergarten. K = kindergarten. Elementary ungraded includes students in grades prekindergarten through 8 who are in classes or programs to which students are assigned without standard grade designations. Secondary ungraded includes students in grades 9 through 12 who are in classes or programs to which students are assigned without standard grade designations. Some data have been revised from previously published figures. Detail may not sum to totals because of rounding. Mean absolute percentage errors of selected education statistics can be found in table A-2, appendix A.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Common Core of Data (CCD), "State Nonfiscal Survey of Public Elementary/Secondary Education," 1994–95 through 2007–08; and National Elementary and Secondary Enrollment Model, 1972–2007. (This table was prepared January 2010.)

**Table 3. Actual and projected numbers for enrollment in public elementary and secondary schools, by race/ethnicity: Fall 1994 through fall 2019**

[In thousands]

Year	Total	Race/ethnicity				
		White	Black	Hispanic	Asian/Pacific Islander	American Indian/ Alaska Native
<b>Actual</b>						
1994	44,111	28,871	7,370	5,777	1,606	487
1995	44,840	29,026	7,555	6,086	1,668	505
1996	45,611	29,217	7,707	6,429	1,731	527
1997	46,127	29,241	7,851	6,705	1,796	535
1998	46,539	29,217	7,935	7,007	1,846	534
1999	46,857	29,032	8,054	7,337	1,892	542
2000	47,204	28,873	8,099	7,733	1,949	550
2001	47,672	28,731	8,176	8,175	2,026	563
2002	48,183	28,614	8,297	8,601	2,088	583
2003	48,540	28,438	8,347	9,018	2,144	593
2004	48,795	28,186	8,400	9,415	2,204	591
2005	49,113	28,001	8,443	9,794	2,278	598
2006	49,316	27,797	8,421	10,171	2,331	595
2007	49,293	27,452	8,385	10,465	2,397	594
<b>Projected</b>						
2008	49,265	27,137	8,300	10,779	2,456	593
2009	49,312	26,892	8,205	11,098	2,523	593
2010	49,386	26,675	8,117	11,407	2,592	595
2011	49,554	26,517	8,053	11,722	2,662	600
2012	49,795	26,405	8,014	12,038	2,731	607
2013	50,088	26,325	7,999	12,352	2,797	615
2014	50,446	26,279	8,008	12,673	2,862	624
2015	50,827	26,257	8,019	12,993	2,925	634
2016	51,198	26,236	8,029	13,303	2,987	643
2017	51,583	26,223	8,045	13,616	3,047	652
2018	51,946	26,213	8,060	13,919	3,093	661
2019	52,342	26,224	8,090	14,216	3,140	671

NOTE: Some data have been revised from previously published figures. The historical racial/ethnic time-series was constructed using racial/ethnic enrollment data at the state level for individual grades. In some instances, enrollment data by race/ethnicity had to be imputed. Further, in some instances, the racial/ethnic enrollment data for individual grades had to be adjusted in order for it to sum to the state total for that grade. For additional information see the Elementary and Secondary Enrollment section of appendix A. Race categories exclude persons of Hispanic ethnicity. Detail may not sum to totals because of rounding. Mean absolute percentage errors of selected education statistics can be found in table A-2, appendix A.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Common Core of Data (CCD), "State Nonfiscal Survey of Public Elementary/Secondary Education," 1994–95 through 2007–08; and National Public Elementary and Secondary Enrollment by Race/Ethnicity Model, 1994–2007. (This table was prepared January 2010.)



**Table 4. Actual and projected numbers for enrollment in grades PK–8 in public elementary and secondary schools, by race/ethnicity: Fall 1994 through fall 2019**

[In thousands]

Year	Total	Race/ethnicity				
		White	Black	Hispanic	Asian/Pacific Islander	American Indian/Alaska Native
<b>Actual</b>						
1994	31,896	20,658	5,420	4,332	1,131	357
1995	32,338	20,682	5,552	4,566	1,170	371
1996	32,762	20,688	5,665	4,822	1,204	386
1997	33,071	20,626	5,783	5,031	1,244	390
1998	33,344	20,549	5,862	5,275	1,275	386
1999	33,486	20,313	5,948	5,529	1,305	391
2000	33,686	20,123	5,980	5,838	1,348	397
2001	33,936	19,954	6,002	6,167	1,408	405
2002	34,114	19,760	6,040	6,453	1,446	415
2003	34,201	19,554	6,013	6,736	1,482	415
2004	34,178	19,266	5,992	6,988	1,519	413
2005	34,204	19,047	5,953	7,223	1,569	412
2006	34,235	18,859	5,880	7,470	1,611	414
2007	34,205	18,677	5,817	7,640	1,660	412
<b>Projected</b>						
2008	34,316	18,560	5,755	7,881	1,706	413
2009	34,505	18,503	5,709	8,119	1,756	419
2010	34,730	18,460	5,690	8,352	1,803	424
2011	34,974	18,433	5,678	8,582	1,850	431
2012	35,206	18,401	5,664	8,805	1,898	437
2013	35,437	18,368	5,657	9,024	1,945	442
2014	35,636	18,333	5,649	9,227	1,978	448
2015	35,881	18,330	5,658	9,426	2,012	455
2016	36,205	18,369	5,682	9,641	2,049	464
2017	36,526	18,399	5,726	9,847	2,082	472
2018	36,838	18,416	5,783	10,050	2,109	479
2019	37,156	18,438	5,837	10,259	2,135	486

NOTE: PK = prekindergarten. Some data have been revised from previously published figures. The historical racial/ethnic time-series was constructed using racial/ethnic enrollment data at the state level for individual grades. In some instances, enrollment data by race/ethnicity had to be imputed. Further, in some instances, the racial/ethnic enrollment data for individual grades had to be adjusted in order for it to sum to the state total for that grade. For additional information see the Elementary and Secondary Enrollment section of appendix A. Race categories exclude persons of Hispanic ethnicity. Detail may not sum to totals because of rounding. Mean absolute percentage errors of selected education statistics can be found in table A-2, appendix A.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Common Core of Data (CCD), "State Nonfiscal Survey of Public Elementary/Secondary Education," 1994–95 through 2007–08; and National Public Elementary and Secondary Enrollment by Race/Ethnicity Model, 1994–2007. (This table was prepared January 2010.)

**Table 5. Actual and projected numbers for enrollment in grades 9–12 in public elementary and secondary schools, by race/ethnicity: Fall 1994 through fall 2019**

[In thousands]

Year	Total	Race/ethnicity				
		White	Black	Hispanic	Asian/Pacific Islander	American Indian/ Alaska Native
<b>Actual</b>						
1994	12,215	8,213	1,949	1,445	475	130
1995	12,502	8,344	2,003	1,520	498	135
1996	12,849	8,529	2,043	1,608	526	141
1997	13,056	8,615	2,068	1,674	552	145
1998	13,195	8,669	2,073	1,732	572	148
1999	13,371	8,719	2,106	1,808	587	151
2000	13,517	8,750	2,119	1,894	601	153
2001	13,736	8,777	2,173	2,008	619	158
2002	14,069	8,854	2,257	2,148	642	168
2003	14,339	8,884	2,334	2,282	663	177
2004	14,618	8,920	2,408	2,427	686	178
2005	14,909	8,954	2,490	2,570	709	186
2006	15,081	8,938	2,540	2,701	720	181
2007	15,087	8,775	2,568	2,824	737	183
<b>Projected</b>						
2008	14,949	8,577	2,545	2,898	749	180
2009	14,807	8,389	2,497	2,979	767	175
2010	14,657	8,215	2,427	3,054	789	171
2011	14,580	8,084	2,375	3,139	812	170
2012	14,589	8,004	2,350	3,233	832	171
2013	14,651	7,957	2,341	3,328	852	173
2014	14,810	7,946	2,359	3,446	884	176
2015	14,946	7,927	2,361	3,567	913	178
2016	14,993	7,867	2,347	3,662	938	179
2017	15,058	7,824	2,319	3,769	966	180
2018	15,108	7,797	2,277	3,869	984	182
2019	15,186	7,786	2,253	3,957	1,005	184

NOTE: Some data have been revised from previously published figures. The historical racial/ethnic time-series was constructed using racial/ethnic enrollment data at the state level for individual grades. In some instances, enrollment data by race/ethnicity had to be imputed. Further, in some instances, the racial/ethnic enrollment data for individual grades had to be adjusted in order for it to sum to the state total for that grade. For additional information see the Elementary and Secondary Enrollment section of appendix A. Race categories exclude persons of Hispanic ethnicity. Detail may not sum to totals because of rounding. Mean absolute percentage errors of selected education statistics can be found in table A-2, appendix A.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Common Core of Data (CCD), "State Nonfiscal Survey of Public Elementary/Secondary Education," 1994–95 through 2007–08; and National Public Elementary and Secondary Enrollment by Race/Ethnicity Model, 1994–2007. (This table was prepared January 2010.)

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**Table 6. Actual and projected numbers for enrollment in grades PK–12 in public elementary and secondary schools, by region and state: Fall 2001 through fall 2019**

[In thousands]										
Region and state	Actual							Projected		
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
<b>United States</b>	<b>47,672</b>	<b>48,183</b>	<b>48,540</b>	<b>48,795</b>	<b>49,113</b>	<b>49,316</b>	<b>49,293</b>	<b>49,265</b>	<b>49,312</b>	<b>49,386</b>
Northeast	8,250	8,297	8,292	8,271	8,240	8,258	8,122	7,989	7,900	7,817
Connecticut	570	570	577	577	575	575	571	564	559	554
Maine	206	204	202	199	195	194	196	193	190	186
Massachusetts	973	983	980	976	972	969	963	951	940	930
New Hampshire	207	208	207	207	206	204	201	197	194	192
New Jersey	1,342	1,367	1,381	1,393	1,396	1,389	1,382	1,367	1,360	1,354
New York	2,872	2,888	2,865	2,836	2,816	2,810	2,765	2,700	2,658	2,620
Pennsylvania	1,822	1,817	1,821	1,828	1,831	1,871	1,802	1,782	1,768	1,755
Rhode Island	158	159	159	156	153	152	148	144	141	138
Vermont	101	100	99	98	97	95	94	92	90	88
Midwest	10,745	10,819	10,809	10,775	10,819	10,819	10,770	10,666	10,594	10,525
Illinois	2,071	2,084	2,101	2,098	2,112	2,118	2,113	2,103	2,095	2,084
Indiana	996	1,004	1,011	1,021	1,035	1,046	1,047	1,044	1,042	1,040
Iowa	486	482	481	478	483	483	485	480	478	476
Kansas	470	471	470	469	468	470	468	468	469	470
Michigan	1,731	1,785	1,758	1,751	1,742	1,723	1,693	1,660	1,630	1,601
Minnesota	851	847	843	839	839	841	838	832	828	826
Missouri	910	906	906	905	918	920	917	909	906	903
Nebraska	285	285	286	286	287	288	291	289	289	290
North Dakota	106	104	102	101	98	97	95	94	93	92
Ohio	1,831	1,838	1,845	1,840	1,840	1,837	1,827	1,804	1,786	1,768
South Dakota	128	130	126	123	122	121	122	121	121	121
Wisconsin	879	881	880	865	875	877	875	863	857	854
South	17,237	17,471	17,673	17,892	18,103	18,294	18,425	18,554	18,711	18,870
Alabama	737	739	731	730	742	744	745	744	743	742
Arkansas	450	451	455	463	474	476	479	477	480	483
Delaware	116	116	118	119	121	122	123	123	124	124
District of Columbia	75	76	78	77	77	73	78	76	78	79
Florida	2,500	2,540	2,588	2,639	2,675	2,672	2,667	2,670	2,679	2,692
Georgia	1,471	1,496	1,523	1,553	1,598	1,629	1,650	1,673	1,695	1,716
Kentucky	654	661	663	675	680	683	666	681	682	683
Louisiana	731	730	728	724	655	676	681	677	677	675
Maryland	861	867	869	866	860	852	846	831	822	814
Mississippi	494	493	494	495	495	495	494	492	491	488
North Carolina	1,315	1,336	1,360	1,386	1,416	1,444	1,489	1,517	1,548	1,582
Oklahoma	622	625	626	629	635	639	642	643	647	650
South Carolina	676	694	699	704	702	708	712	716	717	718
Tennessee	925	928	937	941	954	978	964	959	959	959
Texas	4,163	4,260	4,332	4,405	4,525	4,600	4,675	4,769	4,863	4,955
Virginia	1,163	1,177	1,192	1,205	1,214	1,220	1,231	1,226	1,228	1,231
West Virginia	283	282	281	280	281	282	283	280	279	278
West	11,440	11,596	11,766	11,857	11,951	11,945	11,976	12,056	12,107	12,174
Alaska	134	134	134	133	133	133	131	130	128	127
Arizona	922	938	1,012	1,043	1,094	1,068	1,087	1,107	1,131	1,159
California	6,248	6,354	6,414	6,442	6,437	6,407	6,343	6,373	6,366	6,367
Colorado	742	752	758	766	780	794	802	809	816	824
Hawaii	185	184	184	183	183	181	180	178	177	177
Idaho	247	249	252	256	262	267	272	276	281	286
Montana	152	150	148	147	145	144	143	142	141	141
Nevada	357	369	385	400	412	425	429	440	451	461
New Mexico	320	320	323	326	327	328	329	331	332	334
Oregon	551	554	551	553	552	563	566	565	566	568
Utah	485	489	496	504	508	523	576	588	601	613
Washington	1,009	1,015	1,021	1,020	1,032	1,027	1,030	1,030	1,029	1,030
Wyoming	88	88	87	85	84	85	86	87	88	89

See notes at end of table.

**Table 6. Actual and projected numbers for enrollment in grades PK–12 in public elementary and secondary schools, by region and state: Fall 2001 through fall 2019—Continued**

[In thousands]

Region and state	Projected—Continued								
	2011	2012	2013	2014	2015	2016	2017	2018	2019
<b>United States</b>	<b>49,554</b>	<b>49,795</b>	<b>50,088</b>	<b>50,446</b>	<b>50,827</b>	<b>51,198</b>	<b>51,583</b>	<b>51,946</b>	<b>52,342</b>
Northeast	7,750	7,696	7,655	7,630	7,615	7,602	7,601	7,601	7,611
Connecticut	549	545	542	539	538	536	536	536	538
Maine	184	183	182	181	181	181	181	180	180
Massachusetts	922	915	909	904	899	895	893	891	890
New Hampshire	191	190	189	189	190	190	192	193	195
New Jersey	1,347	1,343	1,340	1,338	1,336	1,336	1,336	1,337	1,339
New York	2,590	2,565	2,544	2,530	2,520	2,512	2,508	2,504	2,505
Pennsylvania	1,744	1,736	1,733	1,733	1,735	1,737	1,738	1,740	1,744
Rhode Island	135	133	132	131	130	130	131	132	132
Vermont	87	87	86	86	86	87	87	88	88
Midwest	10,476	10,448	10,436	10,441	10,452	10,458	10,466	10,470	10,477
Illinois	2,075	2,066	2,059	2,058	2,057	2,058	2,059	2,059	2,061
Indiana	1,041	1,041	1,042	1,043	1,045	1,047	1,048	1,049	1,048
Iowa	476	476	477	478	479	479	479	478	477
Kansas	473	476	479	482	485	488	490	491	492
Michigan	1,579	1,562	1,549	1,541	1,534	1,528	1,524	1,521	1,520
Minnesota	826	828	832	838	844	852	859	866	873
Missouri	902	904	907	911	915	918	921	923	926
Nebraska	291	292	294	295	297	298	299	300	300
North Dakota	91	91	91	90	90	90	90	91	91
Ohio	1,751	1,739	1,730	1,724	1,718	1,710	1,703	1,695	1,688
South Dakota	121	121	121	122	122	123	123	123	123
Wisconsin	852	852	855	859	863	867	871	874	877
South	19,064	19,285	19,512	19,754	19,985	20,203	20,415	20,606	20,806
Alabama	740	739	739	739	738	736	734	731	729
Arkansas	487	490	494	497	500	502	504	506	508
Delaware	125	126	127	128	130	131	132	133	134
District of Columbia	78	78	78	79	79	79	80	80	80
Florida	2,721	2,756	2,789	2,828	2,867	2,910	2,956	3,002	3,051
Georgia	1,738	1,763	1,789	1,815	1,840	1,862	1,882	1,899	1,916
Kentucky	685	686	688	689	690	689	687	684	682
Louisiana	675	677	677	678	680	680	680	678	676
Maryland	809	807	807	810	815	822	832	841	852
Mississippi	486	484	483	482	481	479	476	472	469
North Carolina	1,616	1,648	1,682	1,715	1,744	1,769	1,792	1,812	1,833
Oklahoma	655	660	665	671	675	678	681	683	685
South Carolina	721	726	731	737	742	746	749	751	753
Tennessee	962	965	970	977	983	988	993	998	1,005
Texas	5,054	5,160	5,264	5,370	5,471	5,570	5,666	5,752	5,838
Virginia	1,236	1,243	1,252	1,264	1,277	1,289	1,302	1,315	1,328
West Virginia	277	276	275	274	273	272	270	268	266
West	12,264	12,366	12,485	12,621	12,775	12,935	13,102	13,269	13,448
Alaska	128	128	130	131	134	136	138	141	144
Arizona	1,191	1,220	1,252	1,283	1,315	1,348	1,381	1,414	1,447
California	6,375	6,389	6,415	6,455	6,509	6,573	6,646	6,721	6,805
Colorado	833	843	854	864	875	885	894	901	909
Hawaii	177	177	178	179	180	181	182	183	184
Idaho	291	297	303	308	313	318	322	326	329
Montana	141	141	142	143	144	145	146	147	147
Nevada	472	483	495	507	521	535	549	563	579
New Mexico	336	340	344	348	352	355	358	361	363
Oregon	572	577	582	588	595	601	609	616	624
Utah	626	639	652	663	673	680	686	691	695
Washington	1,033	1,040	1,048	1,059	1,070	1,082	1,095	1,109	1,125
Wyoming	90	92	93	94	95	95	96	96	96

NOTE: PK = prekindergarten. Some data have been revised from previously published figures. Detail may not sum to totals because of rounding.

Mean absolute percentage errors of selected education statistics can be found in table A-2, appendix A.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Common Core of Data (CCD), "State Nonfiscal Survey of Public Elementary/Secondary Education," 2001–02 through 2007–08; and State Public Elementary and Secondary Enrollment Model, 1980–2007. (This table was prepared January 2010.)

**Table 7. Actual and projected percentage changes in PK–12 enrollment in public elementary and secondary schools, by region and state: Selected years, fall 2001 through fall 2019**

Region and state	Actual 2001–2007	Projected		
		2007–2013	2013–2019	2007–2019
<b>United States</b>	<b>3.4</b>	<b>1.6</b>	<b>4.5</b>	<b>6.2</b>
Northeast	-1.6	-5.7	-0.6	-6.3
Connecticut	0.1	-5.0	-0.8	-5.8
Maine	-4.5	-7.4	-0.7	-8.0
Massachusetts	-1.0	-5.6	-2.1	-7.6
New Hampshire	-2.9	-5.9	3.4	-2.6
New Jersey	3.0	-3.1	#	-3.1
New York	-3.7	-8.0	-1.5	-9.4
Pennsylvania	-1.1	-3.9	0.7	-3.2
Rhode Island	-6.6	-10.9	0.5	-10.5
Vermont	-7.1	-8.3	2.4	-6.1
Midwest	0.2	-3.1	0.4	-2.7
Illinois	2.0	-2.5	0.1	-2.4
Indiana	5.1	-0.4	0.5	0.1
Iowa	-0.2	-1.6	#	-1.6
Kansas	-0.4	2.2	2.8	5.1
Michigan	-2.2	-8.5	-1.8	-10.2
Minnesota	-1.6	-0.7	4.9	4.2
Missouri	0.8	-1.1	2.0	0.9
Nebraska	2.2	0.8	2.1	3.0
North Dakota	-10.4	-4.7	0.2	-4.5
Ohio	-0.2	-5.3	-2.4	-7.6
South Dakota	-4.7	-0.2	1.5	1.3
Wisconsin	-0.5	-2.3	2.6	0.3
South	6.9	5.9	6.6	12.9
Alabama	1.0	-0.8	-1.3	-2.1
Arkansas	6.5	3.1	2.8	6.0
Delaware	6.1	3.7	5.1	9.0
District of Columbia	4.0	#	2.3	2.3
Florida	6.7	4.6	9.4	14.4
Georgia	12.2	8.4	7.1	16.2
Kentucky	1.8	3.3	-0.8	2.4
Louisiana	-6.9	-0.5	-0.2	-0.7
Maryland	-1.7	-4.6	5.6	0.8
Mississippi	0.1	-2.2	-3.0	-5.1
North Carolina	13.2	12.9	9.0	23.0
Oklahoma	3.2	3.6	3.0	6.8
South Carolina	5.3	2.6	3.0	5.7
Tennessee	4.3	0.6	3.6	4.2
Texas	12.3	12.6	10.9	24.9
Virginia	5.8	1.8	6.0	7.9
West Virginia	-0.1	-2.6	-3.4	-6.0
West	4.7	4.3	7.7	12.3
Alaska	-2.5	-1.0	10.8	9.6
Arizona	17.9	15.1	15.6	33.1
California	1.5	1.1	6.1	7.3
Colorado	8.0	6.5	6.5	13.4
Hawaii	-2.5	-1.1	3.3	2.2
Idaho	10.4	11.2	8.8	21.0
Montana	-6.0	-0.6	3.8	3.2
Nevada	20.3	15.3	17.0	34.8
New Mexico	2.7	4.4	5.6	10.3
Oregon	2.6	2.9	7.2	10.3
Utah	18.9	13.1	6.7	20.6
Washington	2.1	1.7	7.4	9.2
Wyoming	-1.9	7.5	3.1	10.9

# Rounds to zero.

NOTE: PK = prekindergarten. Calculations are based on unrounded numbers. Mean absolute percentage errors of selected education statistics can be found in table A-2, appendix A.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Common Core of Data (CCD), "State Nonfiscal Survey of Public Elementary/Secondary Education," selected years, 2001–02 through 2007–08; and State Public Elementary and Secondary Enrollment Model, 1980–2007. (This table was prepared January 2010.)

**Table 8. Actual and projected numbers for enrollment in grades PK–8 in public elementary and secondary schools, by region and state: Fall 2001 through fall 2019**

[In thousands]

Region and state	Actual							Projected		
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
<b>United States</b>	<b>33,936</b>	<b>34,114</b>	<b>34,201</b>	<b>34,178</b>	<b>34,204</b>	<b>34,235</b>	<b>34,205</b>	<b>34,316</b>	<b>34,505</b>	<b>34,730</b>
Northeast	5,823	5,810	5,752	5,689	5,623	5,574	5,504	5,425	5,384	5,352
Connecticut	410	406	408	404	400	398	394	390	387	384
Maine	144	142	139	136	133	132	131	129	128	127
Massachusetts	699	701	692	682	675	671	667	659	654	650
New Hampshire	144	144	142	140	139	136	134	132	131	130
New Jersey	972	979	978	976	971	963	954	944	942	940
New York	2,017	2,016	1,978	1,943	1,909	1,887	1,856	1,819	1,799	1,783
Pennsylvania	1,255	1,242	1,236	1,235	1,228	1,220	1,205	1,194	1,189	1,185
Rhode Island	113	113	111	107	104	102	99	96	94	93
Vermont	69	68	67	66	65	64	63	62	61	60
Midwest	7,516	7,535	7,502	7,439	7,425	7,405	7,359	7,296	7,277	7,268
Illinois	1,484	1,488	1,493	1,484	1,480	1,478	1,473	1,460	1,453	1,450
Indiana	711	714	717	720	724	730	730	729	729	730
Iowa	330	326	327	324	326	326	330	327	328	329
Kansas	322	322	322	321	321	326	327	327	330	333
Michigan	1,223	1,254	1,229	1,212	1,191	1,171	1,137	1,116	1,100	1,088
Minnesota	573	568	564	558	558	558	558	558	559	561
Missouri	642	635	632	629	635	634	632	629	632	635
Nebraska	195	195	195	195	195	196	200	200	201	203
North Dakota	70	69	68	67	66	64	63	63	63	63
Ohio	1,287	1,284	1,278	1,267	1,261	1,253	1,241	1,226	1,217	1,211
South Dakota	87	89	86	84	84	83	83	84	84	84
Wisconsin	592	592	590	578	584	585	585	580	580	582
South	12,454	12,573	12,675	12,780	12,882	12,990	13,086	13,246	13,432	13,623
Alabama	536	533	525	522	529	529	527	527	528	529
Arkansas	318	319	322	328	336	337	340	340	344	348
Delaware	81	82	83	84	85	85	85	86	87	88
District of Columbia	58	59	59	57	56	52	56	54	56	57
Florida	1,797	1,809	1,832	1,858	1,873	1,867	1,856	1,878	1,897	1,922
Georgia	1,075	1,089	1,103	1,118	1,145	1,167	1,179	1,201	1,222	1,243
Kentucky	473	477	478	486	487	487	469	484	487	489
Louisiana	537	537	536	534	482	492	500	498	500	501
Maryland	611	610	606	597	589	579	576	566	563	562
Mississippi	362	360	361	361	358	356	354	352	352	353
North Carolina	956	964	974	986	1,003	1,027	1,072	1,095	1,123	1,150
Oklahoma	446	449	450	453	457	460	463	465	472	477
South Carolina	487	500	501	504	498	501	505	508	512	517
Tennessee	675	673	675	671	677	692	682	681	684	690
Texas	3,016	3,080	3,133	3,184	3,268	3,320	3,375	3,469	3,553	3,638
Virginia	826	832	837	840	841	842	850	848	854	862
West Virginia	200	200	199	198	197	198	199	196	197	198
West	8,143	8,197	8,272	8,270	8,274	8,267	8,256	8,348	8,412	8,487
Alaska	95	94	94	92	91	90	89	89	89	89
Arizona	672	660	704	722	740	760	771	790	813	834
California	4,478	4,525	4,540	4,507	4,466	4,410	4,329	4,364	4,365	4,375
Colorado	529	534	536	541	550	559	566	575	584	592
Hawaii	132	131	130	129	127	126	126	124	125	126
Idaho	171	173	175	178	183	187	191	195	199	203
Montana	103	101	100	99	98	97	96	96	97	97
Nevada	262	271	281	289	296	303	308	315	323	331
New Mexico	225	224	226	228	230	230	230	232	235	238
Oregon	382	382	378	377	380	381	384	386	388	391
Utah	338	343	349	355	358	371	410	421	431	441
Washington	696	697	699	695	699	695	697	700	703	707
Wyoming	59	60	60	57	57	58	59	60	62	63

See notes at end of table.

**Table 8. Actual and projected numbers for enrollment in grades PK–8 in public elementary and secondary schools, by region and state: Fall 2001 through fall 2019—Continued**

[In thousands]

Region and state	Projected—Continued								
	2011	2012	2013	2014	2015	2016	2017	2018	2019
<b>United States</b>	<b>34,974</b>	<b>35,206</b>	<b>35,437</b>	<b>35,636</b>	<b>35,881</b>	<b>36,205</b>	<b>36,526</b>	<b>36,838</b>	<b>37,156</b>
Northeast	5,327	5,302	5,286	5,269	5,264	5,277	5,294	5,313	5,336
Connecticut	381	378	376	374	374	375	377	379	382
Maine	126	125	125	124	124	125	126	127	128
Massachusetts	645	640	636	632	629	628	628	628	630
New Hampshire	130	129	130	130	132	133	135	137	139
New Jersey	938	935	933	931	931	932	934	936	940
New York	1,771	1,760	1,754	1,745	1,741	1,742	1,744	1,747	1,752
Pennsylvania	1,184	1,183	1,182	1,179	1,180	1,186	1,194	1,200	1,207
Rhode Island	92	91	91	92	92	93	94	94	95
Vermont	60	60	60	60	61	61	63	63	64
Midwest	7,264	7,258	7,253	7,244	7,241	7,270	7,300	7,328	7,354
Illinois	1,448	1,446	1,444	1,443	1,442	1,446	1,450	1,454	1,458
Indiana	730	731	731	730	727	729	732	734	737
Iowa	330	330	330	330	330	330	330	330	329
Kansas	336	338	339	340	341	343	344	345	345
Michigan	1,078	1,070	1,064	1,059	1,056	1,061	1,067	1,073	1,078
Minnesota	563	566	570	573	577	584	593	601	610
Missouri	638	639	641	642	644	648	650	652	654
Nebraska	205	206	207	207	208	208	208	208	208
North Dakota	63	63	63	63	63	64	64	64	63
Ohio	1,205	1,197	1,190	1,182	1,175	1,175	1,175	1,175	1,175
South Dakota	85	85	85	86	86	86	86	87	87
Wisconsin	584	586	588	589	591	596	601	605	610
South	13,804	13,969	14,119	14,241	14,376	14,527	14,662	14,794	14,929
Alabama	529	528	525	522	520	519	519	518	517
Arkansas	351	353	355	356	357	358	358	359	359
Delaware	89	90	90	91	91	92	93	94	94
District of Columbia	57	58	58	58	59	60	60	60	59
Florida	1,945	1,974	2,003	2,032	2,065	2,102	2,137	2,172	2,207
Georgia	1,263	1,279	1,294	1,305	1,316	1,328	1,340	1,354	1,368
Kentucky	491	491	489	486	484	484	482	480	479
Louisiana	507	508	509	507	507	507	505	502	499
Maryland	562	565	569	574	581	590	599	609	619
Mississippi	353	353	351	348	345	343	341	338	335
North Carolina	1,172	1,192	1,208	1,218	1,228	1,243	1,259	1,275	1,294
Oklahoma	482	486	488	490	492	494	494	494	494
South Carolina	522	525	528	529	530	532	534	536	538
Tennessee	694	697	699	701	705	710	714	719	725
Texas	3,717	3,796	3,870	3,935	4,001	4,062	4,117	4,168	4,218
Virginia	870	877	885	892	900	910	920	930	940
West Virginia	198	198	197	196	194	193	190	187	185
West	8,579	8,676	8,779	8,882	9,000	9,132	9,270	9,403	9,537
Alaska	90	91	93	94	96	99	101	104	106
Arizona	857	879	901	923	946	969	991	1,013	1,035
California	4,399	4,432	4,475	4,519	4,575	4,638	4,704	4,767	4,830
Colorado	601	608	614	619	623	628	634	639	645
Hawaii	127	128	129	130	131	132	133	133	133
Idaho	207	211	214	217	219	222	225	228	231
Montana	98	99	100	101	101	102	103	103	104
Nevada	340	348	357	366	376	385	395	406	418
New Mexico	242	245	248	251	253	255	257	258	259
Oregon	394	397	401	405	410	417	424	432	439
Utah	449	455	459	462	464	467	470	474	477
Washington	712	717	723	729	738	750	765	780	795
Wyoming	64	65	66	66	66	66	66	66	65

NOTE: PK = prekindergarten. Some data have been revised from previously published figures. Detail may not sum to totals because of rounding.

Mean absolute percentage errors of selected education statistics can be found in table A-2, appendix A.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Common Core of Data (CCD), "State Nonfiscal Survey of Public Elementary/Secondary Education," 2001–02 through 2007–08; and State Public Elementary and Secondary Enrollment Model, 1980–2007. (This table was prepared January 2010.)



**Table 9. Actual and projected percentage changes in PK–8 enrollment in public elementary and secondary schools, by region and state: Selected years, fall 2001 through fall 2019**

Region and state	Actual 2001–2007	Projected		
		2007–2013	2013–2019	2007–2019
<b>United States</b>	<b>0.8</b>	<b>3.6</b>	<b>4.9</b>	<b>8.6</b>
Northeast	-5.5	-4.0	0.9	-3.1
Connecticut	-3.9	-4.6	1.6	-3.1
Maine	-9.1	-4.6	2.3	-2.4
Massachusetts	-4.7	-4.6	-1.0	-5.6
New Hampshire	-7.0	-3.4	6.9	3.3
New Jersey	-1.8	-2.3	0.7	-1.6
New York	-8.0	-5.5	-0.1	-5.6
Pennsylvania	-3.9	-2.0	2.1	0.1
Rhode Island	-12.1	-7.8	4.3	-3.8
Vermont	-9.0	-5.1	7.4	1.9
Midwest	-2.1	-1.4	1.4	-0.1
Illinois	-0.8	-1.9	1.0	-1.0
Indiana	2.5	0.3	0.8	1.0
Iowa	#	0.3	-0.4	-0.1
Kansas	1.4	3.8	1.8	5.7
Michigan	-7.0	-6.4	1.3	-5.2
Minnesota	-2.6	2.1	7.0	9.2
Missouri	-1.7	1.5	2.1	3.6
Nebraska	2.8	3.5	0.4	3.9
North Dakota	-9.9	-1.2	1.1	0.0
Ohio	-3.5	-4.1	-1.3	-5.4
South Dakota	-4.1	2.4	1.4	3.8
Wisconsin	-1.1	0.4	3.7	4.2
South	5.1	7.9	5.7	14.1
Alabama	-1.6	-0.3	-1.6	-2.0
Arkansas	6.9	4.4	1.2	5.6
Delaware	4.6	6.1	4.5	10.9
District of Columbia	-3.7	4.0	1.4	5.5
Florida	3.3	7.9	10.2	18.9
Georgia	9.6	9.8	5.7	16.1
Kentucky	-0.9	4.2	-2.1	2.1
Louisiana	-7.0	1.8	-1.8	-0.1
Maryland	-5.6	-1.2	8.6	7.3
Mississippi	-2.2	-0.7	-4.6	-5.3
North Carolina	12.2	12.6	7.1	20.6
Oklahoma	3.7	5.5	1.1	6.7
South Carolina	3.7	4.6	1.9	6.6
Tennessee	1.1	2.6	3.7	6.4
Texas	11.9	14.7	9.0	25.0
Virginia	2.9	4.1	6.2	10.6
West Virginia	-0.6	-0.7	-6.3	-6.9
West	1.4	6.3	8.6	15.5
Alaska	-6.2	4.2	14.7	19.6
Arizona	14.8	16.9	14.8	34.2
California	-3.3	3.4	7.9	11.6
Colorado	6.9	8.5	5.1	14.1
Hawaii	-4.8	2.9	2.6	5.6
Idaho	11.5	11.9	7.7	20.6
Montana	-6.2	3.5	4.0	7.7
Nevada	17.2	16.0	17.0	35.7
New Mexico	2.1	7.9	4.4	12.7
Oregon	0.5	4.6	9.3	14.3
Utah	21.4	12.0	3.9	16.4
Washington	0.2	3.6	10.1	14.1
Wyoming	0.3	10.7	-0.8	9.8

# Rounds to zero.

NOTE: PK = prekindergarten. Calculations are based on unrounded numbers. Mean absolute percentage errors of selected education statistics can be found in table A-2, appendix A.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Common Core of Data (CCD), “State Nonfiscal Survey of Public Elementary/Secondary Education,” selected years, 2001–02 through 2007–08; and State Public Elementary and Secondary Enrollment Model, 1980–2007. (This table was prepared January 2010.)

**Table 10. Actual and projected numbers for enrollment in grades 9–12 in public elementary and secondary schools, by region and state: Fall 2001 through fall 2019**

[In thousands]

Region and state	Actual							Projected		
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
<b>United States</b>	<b>13,736</b>	<b>14,069</b>	<b>14,339</b>	<b>14,618</b>	<b>14,909</b>	<b>15,081</b>	<b>15,087</b>	<b>14,949</b>	<b>14,807</b>	<b>14,657</b>
Northeast	2,427	2,487	2,541	2,582	2,617	2,684	2,618	2,564	2,516	2,466
Connecticut	160	164	169	173	175	177	177	174	172	170
Maine	62	63	63	63	62	62	66	64	62	60
Massachusetts	274	282	288	293	297	298	296	291	286	281
New Hampshire	62	64	65	67	67	67	66	65	64	62
New Jersey	370	389	402	417	425	425	428	423	418	414
New York	855	872	887	894	907	922	909	881	858	836
Pennsylvania	567	575	586	593	603	651	597	588	579	570
Rhode Island	45	47	48	49	50	50	48	48	46	45
Vermont	32	32	32	32	32	32	31	30	29	28
Midwest	3,228	3,284	3,307	3,337	3,394	3,415	3,411	3,370	3,317	3,257
Illinois	587	597	608	614	631	641	640	642	642	634
Indiana	285	290	294	301	311	316	317	316	312	310
Iowa	156	156	154	154	157	157	156	153	150	147
Kansas	148	149	148	148	147	143	142	141	139	138
Michigan	508	531	528	540	551	552	556	544	530	513
Minnesota	278	279	279	280	281	282	279	274	269	265
Missouri	267	272	274	277	283	286	285	280	274	268
Nebraska	90	90	90	91	92	92	91	89	88	87
North Dakota	36	35	34	33	33	32	32	31	30	29
Ohio	544	554	567	573	578	584	586	579	568	558
South Dakota	41	41	40	39	38	38	38	38	37	37
Wisconsin	288	290	290	287	291	292	289	284	277	272
South	4,783	4,898	4,998	5,112	5,221	5,304	5,338	5,308	5,280	5,247
Alabama	202	206	206	208	212	215	218	217	215	213
Arkansas	132	132	133	135	138	140	139	138	136	135
Delaware	34	34	35	35	36	37	38	38	37	37
District of Columbia	17	17	19	20	21	20	23	22	22	22
Florida	703	731	755	782	802	805	811	792	782	770
Georgia	395	407	419	435	453	463	471	472	473	472
Kentucky	181	184	185	189	192	196	197	197	195	194
Louisiana	194	194	191	191	172	184	181	179	177	174
Maryland	250	256	263	268	271	273	269	264	259	252
Mississippi	132	132	133	134	137	139	141	140	138	135
North Carolina	359	372	386	400	413	417	417	422	425	432
Oklahoma	176	176	176	177	178	179	179	178	176	173
South Carolina	189	194	198	199	204	207	208	208	205	201
Tennessee	250	254	261	270	277	286	283	278	275	269
Texas	1,147	1,180	1,199	1,221	1,257	1,280	1,300	1,300	1,309	1,317
Virginia	337	346	355	365	372	379	380	378	374	369
West Virginia	83	82	82	83	84	84	84	83	82	80
West	3,297	3,399	3,494	3,587	3,677	3,678	3,720	3,708	3,695	3,687
Alaska	39	40	40	41	42	42	42	41	39	38
Arizona	251	277	308	321	355	309	316	317	318	325
California	1,769	1,828	1,874	1,934	1,972	1,997	2,015	2,009	2,001	1,992
Colorado	213	217	221	225	230	235	236	234	233	231
Hawaii	53	53	54	54	55	55	54	53	52	51
Idaho	75	75	77	78	79	80	81	81	82	83
Montana	49	49	48	48	48	47	46	45	44	43
Nevada	94	99	105	111	116	122	122	125	128	130
New Mexico	95	96	97	98	97	98	99	99	97	95
Oregon	170	172	173	176	173	182	182	179	178	177
Utah	147	147	147	148	151	152	166	168	170	172
Washington	313	318	322	325	333	332	333	329	326	322
Wyoming	29	28	28	27	27	27	27	27	26	26

See notes at end of table.

**Table 10. Actual and projected numbers for enrollment in grades 9–12 in public elementary and secondary schools, by region and state: Fall 2001 through fall 2019—Continued**

[In thousands]

Region and state	Projected—Continued								
	2011	2012	2013	2014	2015	2016	2017	2018	2019
<b>United States</b>	<b>14,580</b>	<b>14,589</b>	<b>14,651</b>	<b>14,810</b>	<b>14,946</b>	<b>14,993</b>	<b>15,058</b>	<b>15,108</b>	<b>15,186</b>
Northeast	2,423	2,394	2,370	2,361	2,351	2,326	2,307	2,288	2,276
Connecticut	168	167	166	165	164	161	159	157	156
Maine	58	57	57	57	56	55	54	53	53
Massachusetts	277	275	273	272	270	267	265	262	260
New Hampshire	61	60	59	59	58	57	57	56	57
New Jersey	410	408	407	406	406	403	402	401	400
New York	819	804	791	785	779	769	764	757	753
Pennsylvania	560	553	551	553	554	550	545	540	537
Rhode Island	44	42	40	39	38	37	37	37	37
Vermont	27	27	26	26	26	25	24	24	24
Midwest	3,212	3,190	3,183	3,197	3,211	3,188	3,166	3,143	3,123
Illinois	628	620	615	615	615	611	608	605	603
Indiana	310	310	311	313	318	318	317	315	311
Iowa	146	146	147	148	149	149	149	149	148
Kansas	137	138	139	142	144	145	146	146	147
Michigan	501	492	485	482	478	468	457	449	443
Minnesota	262	261	262	265	268	267	266	265	263
Missouri	264	265	266	269	271	270	271	271	271
Nebraska	86	86	87	88	89	90	91	92	92
North Dakota	28	28	28	27	27	27	27	27	27
Ohio	546	542	540	542	543	535	527	520	513
South Dakota	36	36	36	36	37	37	37	37	37
Wisconsin	268	266	267	270	272	272	270	268	267
South	5,260	5,316	5,392	5,513	5,608	5,676	5,753	5,812	5,877
Alabama	211	212	214	217	218	217	215	214	212
Arkansas	136	137	139	141	143	144	146	148	149
Delaware	36	36	37	38	38	39	39	39	39
District of Columbia	21	21	20	20	20	20	19	21	21
Florida	776	782	786	796	802	808	819	831	844
Georgia	475	483	495	510	524	534	541	545	549
Kentucky	193	195	199	203	205	205	205	203	203
Louisiana	168	169	169	170	173	173	175	176	177
Maryland	247	242	237	236	234	232	232	232	234
Mississippi	133	131	132	135	136	135	135	134	134
North Carolina	443	456	474	496	516	526	534	537	539
Oklahoma	172	174	177	181	183	184	187	189	192
South Carolina	199	200	203	208	212	214	215	215	215
Tennessee	267	268	271	276	278	279	279	279	280
Texas	1,337	1,365	1,395	1,436	1,470	1,508	1,548	1,584	1,620
Virginia	366	366	367	372	377	379	382	385	387
West Virginia	79	78	78	79	79	79	80	80	81
West	3,685	3,690	3,706	3,739	3,775	3,803	3,832	3,865	3,911
Alaska	37	37	37	37	37	37	37	37	37
Arizona	334	341	350	359	369	379	390	401	412
California	1,976	1,957	1,940	1,936	1,935	1,935	1,942	1,954	1,975
Colorado	232	235	240	246	252	257	260	262	264
Hawaii	50	49	49	49	48	48	49	50	51
Idaho	84	86	89	91	94	96	97	98	99
Montana	42	42	42	42	42	43	43	43	44
Nevada	132	135	138	142	145	150	154	157	161
New Mexico	94	94	96	97	99	100	101	102	104
Oregon	178	179	181	183	184	185	184	184	185
Utah	177	184	192	201	209	213	216	218	218
Washington	321	323	325	329	332	332	330	329	330
Wyoming	26	27	27	28	29	29	30	30	31

NOTE: Some data have been revised from previously published figures. Detail may not sum to totals because of rounding. Mean absolute percentage errors of selected education statistics can be found in table A-2, appendix A.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Common Core of Data (CCD), "State Nonfiscal Survey of Public Elementary/Secondary Education," 2001–02 through 2007–08; and State Public Elementary and Secondary Enrollment Model, 1980–2007. (This table was prepared January 2010.)

**Table 11. Actual and projected percentage changes in 9–12 enrollment in public elementary and secondary schools, by region and state: Selected years, fall 2001 through fall 2019**

Region and state	Actual 2001–2007	Projected		
		2007–2013	2013–2019	2007–2019
<b>United States</b>	<b>9.8</b>	<b>-2.9</b>	<b>3.7</b>	<b>0.7</b>
Northeast	7.8	-9.5	-4.0	-13.1
Connecticut	10.2	-6.0	-6.3	-11.9
Maine	6.1	-13.1	-7.2	-19.3
Massachusetts	8.2	-7.9	-4.6	-12.2
New Hampshire	6.5	-10.8	-4.2	-14.6
New Jersey	15.7	-5.0	-1.7	-6.6
New York	6.3	-13.0	-4.8	-17.2
Pennsylvania	5.2	-7.6	-2.5	-10.0
Rhode Island	7.1	-17.2	-8.3	-24.1
Vermont	-2.9	-14.9	-9.0	-22.5
Midwest	5.7	-6.7	-1.9	-8.4
Illinois	9.0	-3.9	-1.9	-5.7
Indiana	11.4	-2.0	0.0	-2.0
Iowa	-0.4	-5.6	1.0	-4.7
Kansas	-4.3	-1.5	5.2	3.7
Michigan	9.5	-12.8	-8.7	-20.3
Minnesota	0.4	-6.2	0.4	-5.8
Missouri	6.8	-6.8	2.0	-4.9
Nebraska	0.8	-4.9	6.2	1.0
North Dakota	-11.3	-11.8	-1.8	-13.4
Ohio	7.6	-7.9	-4.9	-12.4
South Dakota	-5.9	-5.7	1.7	-4.1
Wisconsin	0.6	-7.6	#	-7.7
South	11.6	1.0	9.0	10.1
Alabama	7.9	-1.8	-0.6	-2.4
Arkansas	5.5	0.0	7.0	7.0
Delaware	9.6	-1.8	6.5	4.7
District of Columbia	29.6	-9.8	4.8	-5.5
Florida	15.3	-3.1	7.5	4.1
Georgia	19.1	5.1	10.8	16.5
Kentucky	8.8	1.0	2.2	3.2
Louisiana	-6.6	-7.0	4.8	-2.5
Maryland	7.8	-11.8	-1.5	-13.1
Mississippi	6.6	-6.1	1.3	-4.8
North Carolina	16.1	13.6	13.8	29.2
Oklahoma	1.9	-1.3	8.3	6.9
South Carolina	9.6	-2.3	5.9	3.5
Tennessee	12.8	-4.1	3.3	-0.9
Texas	13.3	7.3	16.2	24.6
Virginia	12.9	-3.5	5.5	1.8
West Virginia	1.1	-7.2	3.8	-3.7
West	12.8	-0.4	5.5	5.1
Alaska	6.6	-12.2	0.9	-11.4
Arizona	26.3	10.7	17.7	30.3
California	13.9	-3.7	1.8	-2.0
Colorado	10.9	1.5	10.0	11.7
Hawaii	3.2	-10.3	5.2	-5.7
Idaho	7.8	9.4	11.5	22.1
Montana	-5.6	-9.2	3.4	-6.1
Nevada	29.1	13.4	16.8	32.5
New Mexico	4.3	-3.7	8.7	4.6
Oregon	7.2	-0.6	2.5	1.9
Utah	13.1	15.8	13.4	31.2
Washington	6.4	-2.3	1.4	-1.0
Wyoming	-6.4	0.5	12.7	13.3

# Rounds to zero.

NOTE: Calculations are based on unrounded numbers. Mean absolute percentage errors of selected education statistics can be found in table A-2, appendix A.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Common Core of Data (CCD), "State Nonfiscal Survey of Public Elementary/Secondary Education," selected years, 2001–02 through 2007–08; and State Public Elementary and Secondary Enrollment Model, 1980–2007. (This table was prepared February 2010.)

**Table 12. Actual and projected numbers for high school graduates, by control of school: 1994–95 through 2019–20**

School year	Total	Public	Private
<b>Actual</b>			
1994–95	2,519,084	2,273,541	245,543
1995–96 <sup>1</sup>	2,518,109	2,273,109	245,000
1996–97	2,611,988	2,358,403	253,585
1997–98 <sup>1</sup>	2,704,050	2,439,050	265,000
1998–99	2,758,655	2,485,630	273,025
1999–2000 <sup>1</sup>	2,832,844	2,553,844	279,000
2000–01	2,847,973	2,569,200	278,773
2001–02 <sup>1</sup>	2,906,534	2,621,534	285,000
2002–03	3,015,702	2,719,947	295,755
2003–04 <sup>1</sup>	3,054,438	2,753,438	301,000
2004–05	3,106,499	2,799,250	307,249
2005–06 <sup>1</sup>	3,122,544	2,815,544	307,000
2006–07	3,198,956	2,892,351	306,605
<b>Projected</b>			
2007–08	3,325,370	3,011,060	314,310
2008–09	3,318,770	3,004,570	314,200
2009–10	3,306,220	2,991,310	314,910
2010–11	3,251,720	2,937,170	314,550
2011–12	3,221,990	2,905,990	316,000
2012–13	3,200,130	2,890,740	309,390
2013–14	3,176,300	2,868,100	308,200
2014–15	3,170,560	2,872,470	298,090
2015–16	3,201,060	2,906,330	294,730
2016–17	3,223,000	2,933,220	289,780
2017–18	3,273,690	2,988,630	285,060
2018–19	3,265,020	2,984,530	280,490
2019–20	3,245,900	2,953,060	292,840

<sup>1</sup> Since the biennial Private School Universe Survey (PSS) is collected in the fall of odd-numbered years, private school numbers for alternate years are estimated based on data from the PSS.

NOTE: Some data have been revised from previously published figures. Detail may not sum to totals because of rounding. Mean absolute percentage errors of selected education statistics can be found in table A-2, appendix A.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Common Core of Data (CCD), "State Nonfiscal Survey of Public Elementary/Secondary Education," 1995–96 through 2007–08; Private School Universe Survey (PSS), selected years, 1993–94 through 2007–08; and National Elementary and Secondary High School Graduates Model, 1972–73 through 2006–07. (This table was prepared January 2010.)

**Table 13. Actual and projected numbers for public high school graduates, by race/ethnicity: 1994–95 through 2019–20**

School year	Total	Race/ethnicity				
		White	Black	Hispanic	Asian/Pacific Islander	American Indian/ Alaska Native
<b>Actual</b>						
1994–95	2,273,541	1,653,901	290,305	213,765	93,908	21,662
1995–96	2,273,109	1,639,419	294,253	218,785	99,189	21,463
1996–97	2,358,403	1,687,682	309,626	234,043	104,764	22,287
1997–98	2,439,050	1,733,448	317,856	252,031	112,108	23,607
1998–99	2,485,630	1,754,618	322,532	268,539	115,930	24,012
1999–2000	2,553,844	1,787,322	334,206	283,738	123,231	25,347
2000–01	2,569,200	1,782,293	336,375	297,696	126,847	25,988
2001–02	2,621,534	1,801,174	345,854	314,989	132,347	27,169
2002–03	2,719,947	1,857,955	359,051	339,555	135,614	27,773
2003–04	2,753,438	1,851,136	373,307	362,467	137,913	28,615
2004–05	2,799,250	1,856,768	384,818	383,315	143,722	30,628
2005–06	2,815,544	1,854,776	392,180	388,718	150,567	29,303
2006–07	2,892,351	1,883,602	412,640	410,443	154,871	30,795
<b>Projected</b>						
2007–08	3,011,060	1,925,660	441,840	449,370	160,700	33,490
2008–09	3,004,570	1,883,320	447,350	479,600	162,160	32,140
2009–10	2,991,310	1,849,170	451,000	495,240	164,560	31,340
2010–11	2,937,170	1,792,720	443,690	503,560	167,510	29,690
2011–12	2,905,990	1,753,910	432,110	518,470	172,520	28,980
2012–13	2,890,740	1,728,240	418,970	536,370	178,490	28,680
2013–14	2,868,100	1,702,490	404,960	547,980	184,110	28,570
2014–15	2,872,470	1,685,320	405,580	564,310	188,640	28,610
2015–16	2,906,330	1,689,270	411,120	584,630	191,720	29,600
2016–17	2,933,220	1,691,610	411,630	603,060	196,650	30,270
2017–18	2,988,630	1,696,820	417,840	630,200	213,330	30,440
2018–19	2,984,530	1,677,100	411,180	650,270	215,300	30,680
2019–20	2,953,060	1,646,350	405,370	656,080	215,030	30,230

NOTE: Some data have been revised from previously published figures. Detail may not sum to totals because of rounding. The historical racial/ethnic time-series was constructed using racial/ethnic high school graduate data at the state level. In some instances, high school graduate data by race/ethnicity had to be imputed. Further, in some instances, the racial/ethnic data had to be adjusted in order for it to sum to the state total for high school graduates. For additional information, see the High School Graduates section of appendix A. Race categories exclude persons of Hispanic ethnicity. Mean absolute percentage errors of selected education statistics can be found in table A-2, appendix A.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Common Core of Data (CCD), "State Nonfiscal Survey of Public Elementary/Secondary Education," 1995–96 through 2007–08; and National Public Elementary and Secondary High School Graduates by Race/Ethnicity Model, 1972–73 through 2006–07. (This table was prepared January 2010.)

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**Table 14. Actual and projected numbers for high school graduates of public schools, by region and state: School years 2001–02 through 2019–20**

Region and state	Actual						Projected			
	2001–02	2002–03	2003–04	2004–05	2005–06	2006–07	2007–08	2008–09	2009–10	2010–11
<b>United States</b>	<b>2,621,534</b>	<b>2,719,947</b>	<b>2,753,438</b>	<b>2,799,250</b>	<b>2,815,544</b>	<b>2,892,351</b>	<b>3,011,060</b>	<b>3,004,570</b>	<b>2,991,310</b>	<b>2,937,170</b>
Northeast	461,479	477,241	485,670	503,528	521,015	536,697	543,660	537,150	529,430	516,320
Connecticut	32,327	33,667	34,573	35,515	36,222	37,541	38,300	37,730	37,360	37,320
Maine	12,593	12,947	13,278	13,077	12,950	13,151	14,640	14,620	15,000	14,250
Massachusetts	55,272	55,987	58,326	59,665	61,272	63,903	64,470	64,010	63,380	60,900
New Hampshire	12,452	13,210	13,309	13,775	13,988	14,452	14,860	14,110	14,170	13,650
New Jersey	77,664	81,391	83,826	86,502	90,049	93,013	95,730	96,110	95,270	94,830
New York	140,139	143,818	142,526	153,203	161,817	168,333	172,030	170,820	166,790	159,160
Pennsylvania	114,943	119,933	123,474	124,758	127,830	128,603	126,070	122,840	120,710	120,020
Rhode Island	9,006	9,318	9,258	9,881	10,108	10,384	10,310	9,960	9,840	9,740
Vermont	7,083	6,970	7,100	7,152	6,779	7,317	7,270	6,960	6,910	6,470
Midwest	651,640	673,248	680,178	676,786	684,049	702,987	723,470	719,460	715,410	700,890
Illinois	116,657	117,507	124,763	123,615	126,817	130,220	131,360	131,680	133,960	131,920
Indiana	56,722	57,897	56,008	55,444	57,920	59,887	62,430	63,990	63,040	60,980
Iowa	33,789	34,860	34,339	33,547	33,693	34,127	35,370	34,560	34,360	33,170
Kansas	29,541	29,963	30,155	30,355	29,818	30,139	30,220	29,580	29,620	28,970
Michigan	95,001	100,301	98,823	101,582	102,582	111,838	117,750	115,870	115,950	110,660
Minnesota	57,440	59,432	59,096	58,391	58,898	59,497	61,060	59,290	58,510	57,500
Missouri	54,487	56,925	57,983	57,841	58,417	60,275	61,490	61,400	61,210	60,190
Nebraska	19,910	20,161	20,309	19,940	19,764	19,873	20,700	20,310	20,000	19,490
North Dakota	8,114	8,169	7,888	7,555	7,192	7,159	7,070	6,960	6,820	6,630
Ohio	110,608	115,762	119,029	116,702	117,356	117,658	121,980	122,920	120,730	121,310
South Dakota	8,796	8,999	9,001	8,585	8,589	8,346	8,400	8,120	8,340	8,380
Wisconsin	60,575	63,272	62,784	63,229	63,003	63,968	65,660	64,790	62,880	61,690
South	890,643	930,476	946,808	953,206	962,327	986,801	1,029,180	1,038,510	1,040,800	1,022,320
Alabama	35,887	36,741	36,464	37,453	37,918	38,912	40,400	40,190	40,060	40,410
Arkansas	26,984	27,555	27,181	26,621	28,790	27,166	28,840	28,720	28,490	27,980
Delaware	6,482	6,817	6,951	6,934	7,275	7,205	7,340	7,590	7,880	7,590
District of Columbia	3,090	2,725	3,031	2,781	3,150	2,944	3,780	3,470	3,680	4,130
Florida	119,537	127,484	131,418	133,318	134,686	142,284	149,510	152,710	151,620	141,620
Georgia	65,983	66,890	68,550	70,834	73,498	77,829	81,250	81,030	82,970	83,040
Kentucky	36,337	37,654	37,787	38,399	38,449	39,099	40,850	41,670	41,390	40,790
Louisiana	37,905	37,610	37,019	36,009	33,275	34,274	33,900	34,230	34,930	33,700
Maryland	50,881	51,864	52,870	54,170	55,536	57,564	58,550	57,250	57,100	55,200
Mississippi	23,740	23,810	23,735	23,523	23,848	24,186	25,140	25,670	26,100	25,890
North Carolina	65,955	69,696	72,126	75,010	76,710	76,031	79,440	80,630	78,390	80,160
Oklahoma	36,852	36,694	36,799	36,227	36,497	37,100	37,730	37,630	38,380	36,830
South Carolina	31,302	32,482	33,235	33,439	34,970	35,108	33,860	37,010	37,100	35,920
Tennessee	40,894	44,113	46,096	47,967	50,880	54,502	54,760	54,360	54,070	52,250
Texas	225,167	238,111	244,165	239,717	240,485	241,193	258,760	260,140	263,870	262,730
Virginia	66,519	72,943	72,042	73,667	69,597	73,997	77,670	78,390	77,450	76,860
West Virginia	17,128	17,287	17,339	17,137	16,763	17,407	17,440	17,840	17,320	17,240
West	617,772	638,982	640,782	665,730	648,153	665,866	714,750	709,450	705,660	697,640
Alaska	6,945	7,297	7,236	6,909	7,361	7,666	7,900	8,160	7,730	7,240
Arizona	47,175	49,986	45,508	59,498	54,091	55,954	58,430	57,230	56,240	54,460
California	325,895	341,097	343,480	355,217	343,515	356,641	389,530	383,320	380,540	379,210
Colorado	40,760	42,379	44,777	44,532	44,424	45,628	48,060	48,220	48,360	46,990
Hawaii	10,452	10,013	10,324	10,813	10,922	11,063	11,330	11,210	10,770	10,660
Idaho	15,874	15,858	15,547	15,768	16,096	16,242	16,650	16,670	16,960	16,960
Montana	10,554	10,657	10,500	10,335	10,283	10,122	10,280	10,020	10,000	9,490
Nevada	16,270	16,378	15,201	15,740	16,455	16,455	17,200	18,230	18,580	18,930
New Mexico	18,094	16,923	17,892	17,353	17,822	16,131	17,340	17,690	17,790	17,660
Oregon	31,153	32,587	32,958	32,602	32,394	33,446	36,090	35,760	35,140	34,170
Utah	30,183	29,527	30,252	30,253	29,050	28,276	32,660	34,040	34,370	33,800
Washington	58,311	60,435	61,274	61,094	60,213	62,801	63,710	63,400	63,670	62,680
Wyoming	6,106	5,845	5,833	5,616	5,527	5,441	5,570	5,510	5,520	5,410

See notes at end of table.



**Table 14. Actual and projected numbers for high school graduates of public schools, by region and state: School years 2001–02 through 2019–20—Continued**

Region and state	Projected—Continued								
	2011–12	2012–13	2013–14	2014–15	2015–16	2016–17	2017–18	2018–19	2019–20
<b>United States</b>	<b>2,905,990</b>	<b>2,890,740</b>	<b>2,868,100</b>	<b>2,872,470</b>	<b>2,906,330</b>	<b>2,933,220</b>	<b>2,988,630</b>	<b>2,984,530</b>	<b>2,953,060</b>
Northeast	508,220	498,300	489,140	482,370	483,520	478,740	481,440	474,940	463,630
Connecticut	36,520	35,890	35,870	35,290	35,630	35,110	34,920	34,370	33,490
Maine	13,390	12,980	12,780	12,770	12,820	12,540	12,650	12,440	11,890
Massachusetts	60,340	59,780	58,620	58,060	58,570	57,600	57,770	57,180	55,850
New Hampshire	13,420	13,080	12,770	12,740	12,700	12,430	12,290	12,100	11,900
New Jersey	93,000	92,390	91,240	91,010	91,080	91,250	90,830	90,420	88,970
New York	157,150	153,430	149,830	146,120	145,900	142,820	144,790	141,460	138,860
Pennsylvania	118,470	115,580	113,360	111,990	112,470	113,790	114,910	113,330	109,850
Rhode Island	9,610	9,040	8,780	8,490	8,480	7,410	7,640	8,000	7,470
Vermont	6,320	6,130	5,900	5,900	5,860	5,800	5,640	5,650	5,350
Midwest	687,010	675,840	665,470	663,080	667,630	669,640	677,020	676,370	652,020
Illinois	133,360	131,430	128,050	127,130	126,890	127,060	128,070	127,120	124,530
Indiana	61,190	61,210	61,410	61,020	61,090	61,870	62,980	64,970	61,340
Iowa	32,530	31,890	31,950	32,160	32,560	32,870	33,170	33,250	32,440
Kansas	28,660	28,490	28,340	28,260	29,280	29,730	30,340	30,460	30,010
Michigan	106,970	104,530	101,350	100,310	99,540	98,430	98,640	96,920	91,870
Minnesota	56,350	55,580	54,880	55,330	55,570	56,270	57,080	57,980	55,280
Missouri	57,160	56,430	55,930	56,200	57,770	57,630	58,480	58,220	57,040
Nebraska	19,060	19,010	18,930	18,970	19,140	19,520	20,020	20,290	20,050
North Dakota	6,350	6,200	6,120	6,100	6,080	5,950	5,710	5,820	5,820
Ohio	116,830	114,480	111,980	111,480	112,860	112,770	113,600	112,710	106,940
South Dakota	7,970	7,770	7,770	7,840	7,840	7,940	8,050	8,030	7,900
Wisconsin	60,570	58,830	58,760	58,280	59,030	59,610	60,870	60,600	58,810
South	1,010,110	1,016,330	1,013,540	1,029,430	1,049,990	1,072,080	1,104,820	1,106,560	1,109,890
Alabama	39,970	39,070	38,660	39,100	39,880	40,370	41,050	40,360	39,400
Arkansas	27,740	27,420	27,750	28,360	28,620	29,150	29,510	29,750	29,710
Delaware	7,520	7,320	7,310	7,320	7,480	7,750	7,830	7,970	7,890
District of Columbia	3,980	3,680	3,730	3,560	3,520	3,520	3,650	3,610	3,290
Florida	137,340	143,500	141,250	144,990	143,450	145,600	148,860	149,140	148,970
Georgia	82,350	82,030	82,680	84,300	87,530	89,970	92,980	94,580	94,940
Kentucky	40,300	40,420	40,240	40,460	41,450	43,200	43,940	42,650	41,770
Louisiana	32,310	32,560	32,780	29,850	32,360	32,180	33,500	32,490	32,200
Maryland	54,290	52,710	51,330	50,710	50,010	49,000	50,110	48,810	48,710
Mississippi	25,140	24,580	23,950	23,820	24,100	24,750	25,570	24,830	24,190
North Carolina	82,550	82,790	84,080	88,210	91,640	95,980	101,100	103,340	101,370
Oklahoma	36,590	35,900	35,900	36,520	37,800	38,270	38,980	38,420	39,290
South Carolina	35,220	34,650	34,140	34,540	35,470	36,310	37,500	37,570	37,230
Tennessee	51,780	51,390	50,100	50,730	52,080	53,200	53,700	53,160	52,670
Texas	260,140	266,810	269,480	277,010	282,740	290,530	301,980	305,350	314,040
Virginia	76,020	74,860	74,050	73,860	75,530	76,090	77,760	78,150	77,730
West Virginia	16,870	16,650	16,120	16,110	16,320	16,250	16,810	16,420	16,510
West	700,650	700,270	699,940	697,590	705,200	712,760	725,350	726,660	727,520
Alaska	7,130	6,930	6,770	6,810	6,710	6,920	7,010	6,870	6,720
Arizona	58,070	58,370	60,550	61,350	62,890	65,230	67,020	68,270	70,190
California	380,740	378,590	374,780	368,670	367,730	366,500	371,670	368,780	368,650
Colorado	46,700	46,850	47,240	47,660	49,130	50,370	52,020	52,770	53,190
Hawaii	10,550	10,310	10,070	9,790	9,800	9,760	10,010	9,490	9,760
Idaho	16,940	17,130	17,810	17,830	18,510	19,450	19,720	20,490	20,310
Montana	9,290	9,080	9,060	8,890	9,060	9,070	9,090	9,150	9,170
Nevada	19,310	20,020	20,010	20,120	21,010	21,700	22,070	22,620	23,500
New Mexico	17,120	16,700	16,570	16,810	16,970	17,450	17,680	17,900	18,100
Oregon	33,980	34,410	34,740	34,600	35,360	35,710	36,180	35,970	35,530
Utah	34,310	35,490	36,430	38,040	40,040	41,750	43,260	44,620	43,970
Washington	61,160	61,280	60,570	61,610	62,380	63,140	63,800	63,820	62,330
Wyoming	5,350	5,110	5,340	5,420	5,630	5,710	5,840	5,920	6,070

NOTE: Some data have been revised from previously published figures. Detail may not sum to totals because of rounding. Mean absolute percentage errors of selected education statistics can be found in table A-2, appendix A.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Common Core of Data (CCD), “State Nonfiscal Survey of Public Elementary/Secondary Education,” 2002–03 through 2007–08; and State Public High School Graduates Model, 1980–81 through 2006–07. (This table was prepared January 2010.)

**Table 15. Actual and projected percentage changes in public high school graduates, by region and state: Selected school years, 2001–02 through 2019–20**

Region and state	Actual 2001–02 to 2006–07	Projected		
		2006–07 to 2013–14	2013–14 to 2019–20	2006–07 to 2019–20
<b>United States</b>	<b>10.3</b>	<b>-0.8</b>	<b>3.0</b>	<b>2.1</b>
Northeast	16.3	-8.9	-5.2	-13.6
Connecticut	16.1	-4.4	-6.6	-10.8
Maine	4.4	-2.9	-6.9	-9.6
Massachusetts	15.6	-8.3	-4.7	-12.6
New Hampshire	16.1	-11.7	-6.8	-17.7
New Jersey	19.8	-1.9	-2.5	-4.3
New York	20.1	-11.0	-7.3	-17.5
Pennsylvania	11.9	-11.9	-3.1	-14.6
Rhode Island	15.3	-15.5	-14.9	-28.1
Vermont	3.3	-19.4	-9.3	-26.9
Midwest	7.9	-5.3	-2.0	-7.2
Illinois	11.6	-1.7	-2.8	-4.4
Indiana	5.6	2.5	-0.1	2.4
Iowa	1.0	-6.4	1.5	-4.9
Kansas	2.0	-6.0	5.9	-0.4
Michigan	17.7	-9.4	-9.4	-17.9
Minnesota	3.6	-7.8	0.7	-7.1
Missouri	10.6	-7.2	2.0	-5.4
Nebraska	-0.2	-4.8	5.9	0.9
North Dakota	-11.8	-14.6	-4.9	-18.7
Ohio	6.4	-4.8	-4.5	-9.1
South Dakota	-5.1	-6.9	1.6	-5.4
Wisconsin	5.6	-8.1	0.1	-8.1
South	10.8	2.7	9.5	12.5
Alabama	8.4	-0.6	1.9	1.2
Arkansas	0.7	2.1	7.0	9.3
Delaware	11.2	1.4	8.0	9.5
District of Columbia	-4.7	26.7	-11.9	11.7
Florida	19.0	-0.7	5.5	4.7
Georgia	18.0	6.2	5.5	22.0
Kentucky	7.6	2.9	3.8	6.8
Louisiana	-9.6	-4.4	-1.8	-6.1
Maryland	13.1	-10.8	-5.1	-15.4
Mississippi	1.9	-1.0	1.0	#
North Carolina	15.3	10.6	20.6	33.3
Oklahoma	0.7	-3.2	9.4	5.9
South Carolina	12.2	-2.8	9.1	6.0
Tennessee	33.3	-8.1	5.1	-3.4
Texas	7.1	11.7	16.5	30.2
Virginia	11.2	0.1	5.0	5.0
West Virginia	1.6	-7.4	2.4	-5.2
West	7.8	5.1	3.9	9.3
Alaska	10.4	-11.7	-0.7	-12.3
Arizona	18.6	8.2	15.9	25.4
California	9.4	5.1	-1.6	3.4
Colorado	11.9	3.5	12.6	16.6
Hawaii	5.8	-9.0	-3.1	-11.8
Idaho	2.3	9.6	14.1	25.1
Montana	-4.1	-10.5	1.2	-9.4
Nevada	1.1	21.6	17.4	42.8
New Mexico	-10.8	2.7	9.2	12.2
Oregon	7.4	3.9	2.3	6.2
Utah	-6.3	28.8	20.7	55.5
Washington	7.7	-3.6	2.9	-0.7
Wyoming	-10.9	-1.9	13.8	11.6

# Rounds to zero.

NOTE: Calculations are based on unrounded numbers. Mean absolute percentage errors of selected education statistics can be found in table A-2, appendix A.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Common Core of Data (CCD), "State Nonfiscal Survey of Public Elementary/Secondary Education," 2002–03 and 2007–08; and State Public High School Graduates Model, 1980–81 through 2006–07. (This table was prepared January 2010.)

**Table 16. Actual and projected numbers for elementary and secondary teachers and elementary and secondary new teacher hires, by control of school: Fall 1994 through fall 2019**

[In thousands]

Year	Number of teachers			Number of new teacher hires			
	Total	Control		Total	Control		
		Public	Private		Public	Private	
<b>Actual</b>							
1994 <sup>1</sup>	2,925	2,552	373	—	—	—	—
1995	2,974	2,598	376	—	—	—	—
1996 <sup>1</sup>	3,051	2,667	384	—	—	—	—
1997	3,138	2,746	391	—	—	—	—
1998 <sup>1</sup>	3,230	2,830	400	—	—	—	—
1999	3,319	2,911	408	305	222	—	83
2000 <sup>1</sup>	3,366	2,941	424	—	—	—	—
2001	3,440	3,000	441	—	—	—	—
2002 <sup>1</sup>	3,476	3,034	442	—	—	—	—
2003	3,490	3,049	441	311	236	—	74
2004 <sup>1,2</sup>	3,536	3,091	445	—	—	—	—
2005 <sup>2</sup>	3,593	3,143	450	—	—	—	—
2006 <sup>1,2</sup>	3,622	3,166	456	—	—	—	—
2007 <sup>2</sup>	3,634	3,178	456	327	246	—	80
<b>Projected</b>							
2008	3,612	3,157	455	316	241	—	76
2009	3,617	3,161	457	345	266	—	79
2010	3,633	3,174	460	359	277	—	82
2011	3,662	3,198	464	374	291	—	83
2012	3,701	3,232	469	389	304	—	85
2013	3,747	3,271	475	398	312	—	86
2014	3,805	3,322	483	416	327	—	89
2015	3,862	3,372	490	419	329	—	90
2016	3,922	3,424	498	426	335	—	91
2017	3,984	3,478	506	433	340	—	93
2018	4,048	3,534	514	440	345	—	95
2019	4,107	3,585	522	440	344	—	96

— Not available.

<sup>1</sup> Since the biennial Private School Universe Survey (PSS) is collected in the fall of odd numbered years, private school numbers for alternate years are estimated based on data from the PSS.

<sup>2</sup> Public and private new teacher hire numbers are estimated using the New Teacher Hires Model.

NOTE: Number of teachers reported in full-time equivalents. Some data have been revised from previously published figures. Detail may not sum to totals because of rounding. Mean absolute percentage errors of selected education statistics can be found in table A-2, appendix A.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Common Core of Data (CCD), "State Nonfiscal Survey of Public Elementary/Secondary Education," 1994–95 through 2007–08; Private School Universe Survey (PSS), selected years, 1995–96 through 2007–08; Elementary and Secondary Teacher Model, 1973–2006; and New Teacher Hires Model, 1988–2007. (This table was prepared June 2010.)

**Table 17. Actual and projected numbers for the pupil/teacher ratios in elementary and secondary schools, by control of school: Fall 1994 through fall 2019**

Year	Total	Public	Private
<b>Actual</b>			
1994 <sup>1</sup>	17.1	17.3	16.1
1995	17.1	17.3	15.7
1996 <sup>1</sup>	16.9	17.1	15.5
1997	16.6	16.8	15.2
1998 <sup>1</sup>	16.3	16.4	15.0
1999	15.9	16.1	14.7
2000 <sup>1</sup>	15.9	16.0	14.5
2001	15.7	15.9	14.3
2002 <sup>1</sup>	15.7	15.9	14.1
2003	15.7	15.9	13.8
2004 <sup>1</sup>	15.5	15.8	13.7
2005	15.4	15.6	13.5
2006 <sup>1</sup>	15.3	15.6	13.2
2007	15.2	15.5	13.0
<b>Projected</b>			
2008	15.3	15.6	13.1
2009	15.3	15.6	13.2
2010	15.2	15.6	13.2
2011	15.2	15.5	13.2
2012	15.1	15.4	13.1
2013	15.0	15.3	13.0
2014	14.8	15.2	13.0
2015	14.7	15.1	12.9
2016	14.6	15.0	12.8
2017	14.5	14.8	12.7
2018	14.4	14.7	12.6
2019	14.3	14.6	12.4

<sup>1</sup> Since the biennial Private School Universe Survey (PSS) is collected in the fall of odd-numbered years, private school numbers for alternate years are estimated based on data from the PSS.

NOTE: The pupil/teacher ratios were derived from tables 1 and 16. Teachers reported in full-time equivalents. Some data have been revised from previously published figures. Mean absolute percentage errors of selected education statistics can be found in table A-2, appendix A.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Common Core of Data (CCD), "State Nonfiscal Survey of Public Elementary/Secondary Education," 1994–95 through 2007–08; Private School Universe Survey (PSS), selected years, 1995–96 through 2007–08; National Elementary and Secondary Enrollment Model, 1972–2007; and Elementary and Secondary Teacher Model, 1973–2006. (This table was prepared February 2010.)

**Table 18. Actual and projected numbers for current expenditures and current expenditures per pupil in fall enrollment for public elementary and secondary education: 1994–95 through 2019–20**

School year	Fall enrollment (in thousands)	Current expenditures			
		Constant 2007–08 dollars <sup>1</sup>		Current dollars	
		Total (in billions)	Per pupil in fall enrollment	Total (in billions)	Per pupil in fall enrollment
<b>Actual</b>					
1994–95	44,111	\$343.3	\$7,782	\$243.9	\$5,529
1995–96	44,840	349.5	7,795	255.1	5,689
1996–97	45,611	359.9	7,892	270.2	5,923
1997–98	46,127	373.6	8,100	285.5	6,189
1998–99	46,539	389.7	8,373	302.9	6,508
1999–2000	46,857	405.0	8,644	323.9	6,912
2000–01	47,204	421.3	8,923	348.4	7,380
2001–02	47,672	437.7	9,181	368.4	7,727
2002–03	48,183	450.6	9,351	387.6	8,044
2003–04	48,540	458.9	9,454	403.4	8,310
2004–05	48,795	469.4	9,620	425.0	8,711
2005–06	49,113	477.9	9,729	449.1	9,145
2006–07 <sup>2</sup>	49,246	494.5	10,041	476.8	9,683
<b>Projected</b>					
2007–08	49,293	495.0	10,042	495.0	10,042
2008–09	49,265	491.0	9,967	497.8	10,105
2009–10	49,312	488.1	9,899	499.3	10,126
2010–11	49,386	489.9	9,920	508.7	10,300
2011–12	49,554	494.9	9,987	524.8	10,591
2012–13	49,795	503.9	10,119	544.3	10,930
2013–14	50,088	514.3	10,268	—	—
2014–15	50,446	529.7	10,500	—	—
2015–16	50,827	543.1	10,684	—	—
2016–17	51,198	556.3	10,866	—	—
2017–18	51,583	570.2	11,053	—	—
2018–19	51,946	585.3	11,267	—	—
2019–20	52,342	598.4	11,432	—	—

— Not available.

<sup>1</sup> Based on the Consumer Price Index (CPI) for all urban consumers, Bureau of Labor Statistics, U.S. Department of Labor. For more detail about CPI, see table B-6 in appendix B.

<sup>2</sup> Fall enrollment pertains only to students for whom finance data were collected. This enrollment count differs slightly from enrollment counts reported on other tables.

NOTE: Calculations were made using unrounded numbers. Some data have been revised from previously published figures. Mean absolute percentage errors of selected education statistics can be found in table A-2, appendix A. The fall enrollment number for 2007–08 is an actual number. SOURCE: U.S. Department of Education, National Center for Education Statistics, Common Core of Data (CCD), “State Nonfiscal Survey of Public Elementary/Secondary Education,” 1994–95 through 2007–08; “National Public Education Financial Survey,” 1994–95 through 2006–07; National Elementary and Secondary Enrollment Model, 1972–2007; and Public Elementary and Secondary Education Current Expenditures Model, 1969–70 through 2006–07. (This table was prepared January 2010.)

**Table 19. Actual and projected numbers for current expenditures and current expenditures per pupil in average daily attendance (ADA) for public elementary and secondary education: 1994–95 through 2019–20**

School year	ADA (in thousands)	Current expenditures			
		Constant 2007–08 dollars <sup>1</sup>		Current dollars	
		Total (in billions)	Per pupil in ADA	Total (in billions)	Per pupil in ADA
<b>Actual</b>					
1994–95	40,721	\$343.3	\$8,430	\$243.9	\$5,989
1995–96	41,502	349.5	8,423	255.1	6,147
1996–97	42,262	359.9	8,517	270.2	6,393
1997–98	42,766	373.6	8,738	285.5	6,676
1998–99	43,187	389.7	9,023	302.9	7,013
1999–2000	43,807	405.0	9,246	323.9	7,394
2000–01	44,076	421.3	9,556	348.4	7,904
2001–02	44,605	437.7	9,812	368.4	8,259
2002–03	45,017	450.6	10,009	387.6	8,610
2003–04	45,326	458.9	10,125	403.4	8,900
2004–05	45,625	469.4	10,288	425.0	9,316
2005–06	45,932	477.9	10,403	449.1	9,778
2006–07	46,128	494.5	10,720	476.8	10,337
<b>Projected</b>					
2007–08	46,005	495.0	10,759	495.0	10,759
2008–09	45,979	491.0	10,680	497.8	10,827
2009–10	46,024	488.1	10,606	499.3	10,849
2010–11	46,093	489.9	10,629	508.7	11,036
2011–12	46,249	494.9	10,701	524.8	11,348
2012–13	46,474	503.9	10,842	544.3	11,711
2013–14	46,748	514.3	11,002	—	—
2014–15	47,082	529.7	11,250	—	—
2015–16	47,437	543.1	11,448	—	—
2016–17	47,784	556.3	11,642	—	—
2017–18	48,143	570.2	11,843	—	—
2018–19	48,482	585.3	12,073	—	—
2019–20	48,851	598.4	12,248	—	—

— Not available.

<sup>1</sup> Based on the Consumer Price Index (CPI) for all urban consumers, Bureau of Labor Statistics, U.S. Department of Labor. For more detail about CPI, see table B-6 in appendix B.

NOTE: Calculations were made using unrounded numbers. Some data have been revised from previously published figures. Mean absolute percentage errors of selected education statistics can be found in table A-2, appendix A.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Common Core of Data (CCD), “National Public Education Financial Survey,” 1994–95 through 2006–07; National Elementary and Secondary Average Daily Attendance Model, 1994–95 through 2006–07; and Public Elementary and Secondary Education Current Expenditures Model, 1969–70 through 2006–07. (This table was prepared January 2010.)

**Table 20. Actual and projected numbers for total enrollment in all degree-granting institutions, by sex, attendance status, and control of institution, and actual and projected numbers for first-time freshmen fall enrollment in all degree-granting institutions, by sex: Fall 1994 through fall 2019**

[In thousands]

Year	Total enrollment							First-time freshmen		
	Total	Sex		Attendance status		Control		Total	Sex	
		Men	Women	Full-time	Part-time	Public	Private		Men	Women
<b>Actual</b>										
1994	14,279	6,372	7,907	8,138	6,141	11,134	3,145	2,133	985	1,149
1995	14,262	6,343	7,919	8,129	6,133	11,092	3,169	2,169	1,001	1,168
1996	14,368	6,353	8,015	8,303	6,065	11,121	3,247	2,274	1,047	1,228
1997	14,502	6,396	8,106	8,438	6,064	11,196	3,306	2,219	1,026	1,193
1998	14,507	6,369	8,138	8,563	5,944	11,138	3,369	2,213	1,023	1,190
1999	14,791	6,491	8,301	8,786	6,005	11,309	3,482	2,352	1,092	1,260
2000	15,312	6,722	8,591	9,010	6,303	11,753	3,560	2,428	1,124	1,304
2001	15,928	6,961	8,967	9,448	6,480	12,233	3,695	2,497	1,153	1,344
2002	16,612	7,202	9,410	9,946	6,665	12,752	3,860	2,571	1,171	1,400
2003	16,911	7,260	9,651	10,326	6,585	12,859	4,053	2,592	1,176	1,416
2004	17,272	7,387	9,885	10,610	6,662	12,980	4,292	2,630	1,190	1,440
2005	17,487	7,456	10,032	10,797	6,690	13,022	4,466	2,657	1,200	1,457
2006	17,759	7,575	10,184	10,957	6,802	13,180	4,579	2,707	1,229	1,479
2007	18,248	7,816	10,432	11,270	6,978	13,491	4,757	2,776	1,267	1,509
2008	19,103	8,189	10,914	11,748	7,355	13,972	5,131	3,025	1,389	1,635
<b>Projected</b>										
2009	19,525	8,451	11,073	12,041	7,483	14,410	5,114	3,024	1,394	1,630
2010	19,641	8,511	11,130	12,139	7,502	14,492	5,149	3,043	1,404	1,639
2011	19,713	8,513	11,200	12,199	7,514	14,539	5,174	3,053	1,404	1,649
2012	19,892	8,539	11,353	12,308	7,584	14,663	5,229	3,076	1,407	1,669
2013	20,230	8,624	11,607	12,499	7,731	14,906	5,324	3,122	1,419	1,703
2014	20,709	8,757	11,952	12,775	7,933	15,253	5,456	3,189	1,439	1,750
2015	21,082	8,850	12,232	12,987	8,095	15,522	5,560	3,240	1,452	1,788
2016	21,436	8,936	12,500	13,190	8,247	15,778	5,658	3,288	1,464	1,824
2017	21,779	9,021	12,758	13,389	8,389	16,027	5,751	3,336	1,476	1,860
2018	22,139	9,110	13,029	13,607	8,532	16,291	5,849	3,388	1,490	1,898
2019	22,408	9,184	13,224	13,787	8,621	16,489	5,919	3,430	1,503	1,927

NOTE: Detail may not sum to totals because of rounding. Some data have been revised from previously published figures. Mean absolute percentage errors of selected education statistics can be found in table A-2, appendix A.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System, "Fall Enrollment Survey" (IPEDS-EF:94-99), and Spring 2001 through Spring 2009; Enrollment in Degree-Granting Institutions Model, 1980-2008; and First-Time Freshmen Model, 1975-2008. (This table was prepared February 2010.)

**Table 21. Actual and projected numbers for total enrollment in all degree-granting institutions, by sex, age group, and attendance status: Fall 1994 through fall 2019**

[In thousands]

Sex, age group, and attendance status	Actual												
	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
<b>Total enrollment</b>	<b>14,279</b>	<b>14,262</b>	<b>14,368</b>	<b>14,502</b>	<b>14,507</b>	<b>14,791</b>	<b>15,312</b>	<b>15,928</b>	<b>16,612</b>	<b>16,911</b>	<b>17,272</b>	<b>17,487</b>	<b>17,759</b>
14 to 17 years old	136	171	183	174	142	137	140	161	162	184	184	210	204
18 and 19 years old	2,838	2,893	3,001	3,164	3,251	3,461	3,473	3,561	3,525	3,542	3,560	3,640	3,777
20 and 21 years old	2,690	2,680	2,752	2,782	2,876	2,954	3,104	3,291	3,405	3,519	3,634	3,676	3,717
22 to 24 years old	2,482	2,397	2,396	2,406	2,416	2,462	2,602	2,769	3,079	3,137	3,211	3,104	3,191
25 to 29 years old	2,039	2,074	2,078	2,051	1,944	1,914	1,963	2,023	2,130	2,195	2,306	2,397	2,421
30 to 34 years old	1,334	1,282	1,177	1,171	1,145	1,181	1,244	1,284	1,358	1,333	1,354	1,365	1,391
35 years old and over	2,760	2,765	2,780	2,754	2,733	2,683	2,786	2,839	2,954	3,001	3,022	3,095	3,058
<b>Men</b>	<b>6,372</b>	<b>6,343</b>	<b>6,353</b>	<b>6,396</b>	<b>6,369</b>	<b>6,491</b>	<b>6,722</b>	<b>6,961</b>	<b>7,202</b>	<b>7,260</b>	<b>7,387</b>	<b>7,456</b>	<b>7,575</b>
14 to 17 years old	59	71	69	65	56	61	63	66	65	73	73	79	78
18 and 19 years old	1,309	1,329	1,363	1,443	1,470	1,570	1,559	1,608	1,590	1,580	1,569	1,608	1,690
20 and 21 years old	1,271	1,255	1,293	1,327	1,367	1,392	1,427	1,522	1,545	1,602	1,672	1,727	1,680
22 to 24 years old	1,241	1,185	1,175	1,172	1,136	1,160	1,234	1,315	1,430	1,427	1,453	1,401	1,451
25 to 29 years old	933	960	975	961	917	863	895	890	941	956	991	1,024	1,016
30 to 34 years old	581	545	493	462	474	488	530	527	567	550	550	539	586
35 years old and over	977	997	984	967	950	956	1,014	1,032	1,065	1,072	1,080	1,078	1,073
<b>Women</b>	<b>7,907</b>	<b>7,919</b>	<b>8,015</b>	<b>8,106</b>	<b>8,138</b>	<b>8,301</b>	<b>8,591</b>	<b>8,967</b>	<b>9,410</b>	<b>9,651</b>	<b>9,885</b>	<b>10,032</b>	<b>10,184</b>
14 to 17 years old	77	99	114	110	86	76	77	95	97	111	111	131	125
18 and 19 years old	1,528	1,564	1,638	1,720	1,782	1,890	1,914	1,953	1,935	1,962	1,991	2,031	2,087
20 and 21 years old	1,419	1,425	1,459	1,455	1,509	1,562	1,677	1,769	1,860	1,916	1,963	1,949	2,037
22 to 24 years old	1,241	1,213	1,221	1,234	1,280	1,302	1,368	1,453	1,649	1,710	1,759	1,703	1,740
25 to 29 years old	1,106	1,114	1,103	1,090	1,028	1,050	1,068	1,133	1,189	1,240	1,315	1,373	1,405
30 to 34 years old	753	737	684	709	670	693	714	757	791	782	804	826	805
35 years old and over	1,783	1,768	1,796	1,787	1,783	1,727	1,772	1,807	1,889	1,930	1,942	2,018	1,984
<b>Full-time, total</b>	<b>8,138</b>	<b>8,129</b>	<b>8,303</b>	<b>8,438</b>	<b>8,563</b>	<b>8,786</b>	<b>9,010</b>	<b>9,448</b>	<b>9,946</b>	<b>10,326</b>	<b>10,610</b>	<b>10,797</b>	<b>10,957</b>
14 to 17 years old	110	134	138	127	114	117	124	136	135	150	139	155	150
18 and 19 years old	2,360	2,402	2,501	2,619	2,704	2,882	2,859	2,932	2,924	2,992	3,006	3,065	3,181
20 and 21 years old	2,139	2,114	2,179	2,211	2,301	2,354	2,434	2,618	2,719	2,845	2,897	2,951	2,991
22 to 24 years old	1,560	1,543	1,571	1,594	1,611	1,618	1,690	1,765	1,947	2,041	2,113	2,095	2,096
25 to 29 years old	876	889	902	907	877	860	880	920	1,023	1,069	1,127	1,170	1,193
30 to 34 years old	435	416	395	379	360	368	420	456	505	486	523	552	563
35 years old and over	657	630	617	601	597	587	603	620	694	744	805	809	782
<b>Men</b>	<b>3,855</b>	<b>3,807</b>	<b>3,851</b>	<b>3,890</b>	<b>3,934</b>	<b>4,026</b>	<b>4,111</b>	<b>4,300</b>	<b>4,501</b>	<b>4,638</b>	<b>4,739</b>	<b>4,803</b>	<b>4,879</b>
14 to 17 years old	47	59	58	53	49	53	53	53	52	60	50	55	53
18 and 19 years old	1,085	1,094	1,122	1,175	1,202	1,275	1,255	1,302	1,312	1,332	1,324	1,356	1,420
20 and 21 years old	1,007	993	1,015	1,053	1,104	1,130	1,133	1,217	1,241	1,304	1,353	1,392	1,366
22 to 24 years old	832	811	807	800	783	795	829	872	945	970	988	972	984
25 to 29 years old	453	445	458	448	441	406	419	426	477	492	491	503	530
30 to 34 years old	187	171	162	149	151	154	191	196	221	206	229	224	235
35 years old and over	244	234	229	213	203	213	233	235	252	274	305	301	292
<b>Women</b>	<b>4,283</b>	<b>4,321</b>	<b>4,452</b>	<b>4,548</b>	<b>4,630</b>	<b>4,761</b>	<b>4,899</b>	<b>5,148</b>	<b>5,445</b>	<b>5,688</b>	<b>5,871</b>	<b>5,994</b>	<b>6,078</b>
14 to 17 years old	63	75	80	74	65	64	72	83	82	90	89	100	97
18 and 19 years old	1,275	1,308	1,379	1,444	1,502	1,607	1,604	1,630	1,612	1,659	1,682	1,709	1,761
20 and 21 years old	1,132	1,121	1,163	1,158	1,197	1,224	1,302	1,400	1,477	1,541	1,544	1,559	1,625
22 to 24 years old	729	732	765	794	828	823	861	894	1,001	1,071	1,125	1,123	1,112
25 to 29 years old	423	444	444	458	436	454	461	494	546	577	636	667	663
30 to 34 years old	248	245	233	230	209	214	229	260	284	280	294	328	329
35 years old and over	414	396	387	389	394	375	370	386	443	470	501	507	491

See notes at end of table.



**Table 21. Actual and projected numbers for total enrollment in all degree-granting institutions, by sex, age group, and attendance status: Fall 1994 through fall 2019—Continued**

[In thousands]

Sex, age group, and attendance status	Actual		Projected										
	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
<b>Total enrollment</b>	<b>18,248</b>	<b>19,103</b>	<b>19,525</b>	<b>19,641</b>	<b>19,713</b>	<b>19,892</b>	<b>20,230</b>	<b>20,709</b>	<b>21,082</b>	<b>21,436</b>	<b>21,779</b>	<b>22,139</b>	<b>22,408</b>
14 to 17 years old	202	193	201	199	196	197	200	204	209	217	224	234	237
18 and 19 years old	3,912	4,090	4,205	4,181	4,134	4,109	4,117	4,168	4,195	4,224	4,292	4,380	4,493
20 and 21 years old	3,751	3,929	4,015	4,125	4,184	4,178	4,183	4,206	4,230	4,265	4,274	4,291	4,333
22 to 24 years old	3,310	3,480	3,525	3,563	3,614	3,728	3,847	3,953	4,001	4,026	4,047	4,068	4,056
25 to 29 years old	2,561	2,737	2,788	2,792	2,791	2,822	2,898	3,019	3,143	3,258	3,352	3,423	3,438
30 to 34 years old	1,422	1,482	1,494	1,527	1,565	1,610	1,668	1,733	1,782	1,826	1,868	1,913	1,948
35 years old and over	3,091	3,191	3,297	3,254	3,228	3,248	3,317	3,425	3,520	3,621	3,722	3,830	3,904
<b>Men</b>	<b>7,816</b>	<b>8,189</b>	<b>8,451</b>	<b>8,511</b>	<b>8,513</b>	<b>8,539</b>	<b>8,624</b>	<b>8,757</b>	<b>8,850</b>	<b>8,936</b>	<b>9,021</b>	<b>9,110</b>	<b>9,184</b>
14 to 17 years old	86	92	87	86	84	84	84	85	87	89	91	95	95
18 and 19 years old	1,767	1,850	1,913	1,900	1,873	1,855	1,852	1,867	1,873	1,879	1,904	1,938	1,983
20 and 21 years old	1,711	1,792	1,846	1,899	1,919	1,906	1,901	1,905	1,910	1,919	1,916	1,917	1,932
22 to 24 years old	1,499	1,558	1,607	1,624	1,641	1,685	1,728	1,762	1,773	1,774	1,775	1,774	1,761
25 to 29 years old	1,110	1,177	1,216	1,219	1,213	1,216	1,236	1,274	1,315	1,351	1,380	1,399	1,398
30 to 34 years old	598	640	659	673	686	700	719	738	752	763	773	783	793
35 years old and over	1,045	1,080	1,123	1,110	1,096	1,093	1,104	1,124	1,141	1,161	1,182	1,205	1,222
<b>Women</b>	<b>10,432</b>	<b>10,914</b>	<b>11,073</b>	<b>11,130</b>	<b>11,200</b>	<b>11,353</b>	<b>11,607</b>	<b>11,952</b>	<b>12,232</b>	<b>12,500</b>	<b>12,758</b>	<b>13,029</b>	<b>13,224</b>
14 to 17 years old	116	101	114	113	112	113	115	119	123	128	132	140	141
18 and 19 years old	2,145	2,240	2,293	2,281	2,262	2,254	2,266	2,300	2,323	2,345	2,388	2,442	2,511
20 and 21 years old	2,040	2,137	2,169	2,227	2,265	2,272	2,282	2,301	2,320	2,346	2,358	2,374	2,401
22 to 24 years old	1,811	1,922	1,918	1,939	1,973	2,043	2,120	2,191	2,228	2,252	2,272	2,294	2,294
25 to 29 years old	1,451	1,560	1,571	1,573	1,577	1,605	1,662	1,745	1,828	1,906	1,972	2,024	2,040
30 to 34 years old	825	842	835	853	879	910	949	995	1,031	1,063	1,095	1,129	1,154
35 years old and over	2,046	2,112	2,173	2,144	2,132	2,155	2,213	2,301	2,379	2,460	2,540	2,625	2,683
<b>Full-time, total</b>	<b>11,270</b>	<b>11,748</b>	<b>12,041</b>	<b>12,139</b>	<b>12,199</b>	<b>12,308</b>	<b>12,499</b>	<b>12,775</b>	<b>12,987</b>	<b>13,190</b>	<b>13,389</b>	<b>13,607</b>	<b>13,787</b>
14 to 17 years old	161	162	159	158	156	157	159	163	167	174	180	189	191
18 and 19 years old	3,301	3,455	3,532	3,512	3,475	3,458	3,469	3,517	3,544	3,573	3,635	3,713	3,813
20 and 21 years old	3,036	3,177	3,237	3,326	3,375	3,375	3,383	3,408	3,432	3,465	3,476	3,494	3,531
22 to 24 years old	2,182	2,292	2,311	2,338	2,375	2,455	2,537	2,609	2,646	2,668	2,687	2,707	2,701
25 to 29 years old	1,257	1,317	1,373	1,375	1,376	1,394	1,436	1,502	1,568	1,631	1,682	1,722	1,732
30 to 34 years old	540	521	562	575	590	609	633	661	683	703	721	741	757
35 years old and over	793	823	867	856	851	859	882	915	945	976	1,008	1,041	1,064
<b>Men</b>	<b>5,029</b>	<b>5,234</b>	<b>5,433</b>	<b>5,479</b>	<b>5,483</b>	<b>5,501</b>	<b>5,558</b>	<b>5,652</b>	<b>5,719</b>	<b>5,781</b>	<b>5,842</b>	<b>5,908</b>	<b>5,966</b>
14 to 17 years old	70	73	65	65	64	63	64	65	66	68	70	73	73
18 and 19 years old	1,494	1,572	1,609	1,598	1,576	1,563	1,563	1,580	1,587	1,595	1,619	1,650	1,689
20 and 21 years old	1,383	1,450	1,496	1,539	1,555	1,547	1,545	1,553	1,560	1,571	1,571	1,574	1,588
22 to 24 years old	1,032	1,073	1,101	1,113	1,126	1,158	1,190	1,217	1,229	1,234	1,238	1,241	1,234
25 to 29 years old	561	575	623	625	621	624	637	660	685	708	726	739	740
30 to 34 years old	224	226	246	251	256	262	270	280	287	293	298	304	309
35 years old and over	266	266	292	288	285	285	289	298	305	312	320	328	334
<b>Women</b>	<b>6,240</b>	<b>6,513</b>	<b>6,609</b>	<b>6,660</b>	<b>6,716</b>	<b>6,806</b>	<b>6,941</b>	<b>7,123</b>	<b>7,268</b>	<b>7,408</b>	<b>7,548</b>	<b>7,699</b>	<b>7,821</b>
14 to 17 years old	91	89	94	93	92	93	95	98	101	106	110	116	118
18 and 19 years old	1,807	1,883	1,923	1,914	1,899	1,895	1,907	1,937	1,957	1,978	2,016	2,064	2,123
20 and 21 years old	1,653	1,727	1,741	1,787	1,820	1,828	1,838	1,855	1,872	1,894	1,905	1,920	1,943
22 to 24 years old	1,149	1,220	1,211	1,225	1,249	1,298	1,347	1,392	1,417	1,434	1,449	1,466	1,467
25 to 29 years old	696	742	749	751	755	770	799	841	883	923	956	984	992
30 to 34 years old	316	295	316	323	334	347	363	382	396	410	423	437	448
35 years old and over	528	557	575	567	566	575	592	618	641	664	688	713	730

See notes at end of table.

**Table 21. Actual and projected numbers for total enrollment in all degree-granting institutions, by sex, age group, and attendance status: Fall 1994 through fall 2019—Continued**

[In thousands]

Sex, age group, and attendance status	Actual												
	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
<b>Part-time, total</b>	<b>6,141</b>	<b>6,133</b>	<b>6,065</b>	<b>6,064</b>	<b>5,944</b>	<b>6,005</b>	<b>6,303</b>	<b>6,480</b>	<b>6,665</b>	<b>6,585</b>	<b>6,662</b>	<b>6,690</b>	<b>6,802</b>
14 to 17 years old	26	36	45	47	28	20	16	25	28	34	45	55	53
18 and 19 years old	477	491	500	545	547	578	614	629	601	550	554	574	596
20 and 21 years old	552	566	573	571	575	600	670	674	686	674	737	725	726
22 to 24 years old	922	854	825	812	805	845	912	1,003	1,132	1,097	1,098	1,009	1,096
25 to 29 years old	1,162	1,184	1,176	1,144	1,067	1,054	1,083	1,103	1,107	1,126	1,179	1,227	1,228
30 to 34 years old	899	866	782	793	785	812	825	828	852	847	832	814	828
35 years old and over	2,103	2,135	2,164	2,153	2,136	2,096	2,184	2,219	2,260	2,258	2,217	2,287	2,275
<b>Men</b>	<b>2,517</b>	<b>2,535</b>	<b>2,502</b>	<b>2,506</b>	<b>2,436</b>	<b>2,465</b>	<b>2,611</b>	<b>2,661</b>	<b>2,701</b>	<b>2,622</b>	<b>2,648</b>	<b>2,653</b>	<b>2,695</b>
14 to 17 years old	11	13	11	11	7	8	10	13	12	13	23	24	25
18 and 19 years old	224	235	241	268	267	295	304	307	278	248	245	252	270
20 and 21 years old	264	262	277	274	262	262	294	305	304	298	319	335	314
22 to 24 years old	410	373	369	372	353	365	405	444	485	457	465	429	467
25 to 29 years old	480	515	517	513	476	457	476	464	464	463	500	521	486
30 to 34 years old	394	375	331	313	323	334	339	331	346	344	322	315	351
35 years old and over	734	763	755	754	747	743	782	797	813	798	775	776	781
<b>Women</b>	<b>3,624</b>	<b>3,598</b>	<b>3,563</b>	<b>3,559</b>	<b>3,508</b>	<b>3,540</b>	<b>3,692</b>	<b>3,820</b>	<b>3,964</b>	<b>3,963</b>	<b>4,014</b>	<b>4,038</b>	<b>4,106</b>
14 to 17 years old	15	24	34	36	22	12	5	11	15	21	22	31	28
18 and 19 years old	253	256	259	276	280	283	310	323	323	302	310	322	326
20 and 21 years old	287	304	295	297	313	338	376	369	382	375	419	390	412
22 to 24 years old	512	481	456	441	452	479	507	559	647	639	633	580	628
25 to 29 years old	683	670	659	632	591	596	607	639	643	663	679	706	742
30 to 34 years old	505	491	451	480	461	479	485	496	507	502	510	499	477
35 years old and over	1,369	1,372	1,409	1,398	1,389	1,353	1,402	1,422	1,447	1,460	1,441	1,511	1,494

See notes at end of table.

**Table 21. Actual and projected numbers for total enrollment in all degree-granting institutions, by sex, age group, and attendance status: Fall 1994 through fall 2019—Continued**

[In thousands]

Sex, age group, and attendance status	Actual		Projected										
	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
<b>Part-time, total</b>	<b>6,978</b>	<b>7,355</b>	<b>7,483</b>	<b>7,502</b>	<b>7,514</b>	<b>7,584</b>	<b>7,731</b>	<b>7,933</b>	<b>8,095</b>	<b>8,247</b>	<b>8,389</b>	<b>8,532</b>	<b>8,621</b>
14 to 17 years old	41	31	42	41	40	40	40	41	42	43	44	46	46
18 and 19 years old	610	635	673	669	659	651	648	651	651	651	657	667	681
20 and 21 years old	715	752	778	800	808	803	800	799	798	800	798	797	803
22 to 24 years old	1,128	1,188	1,214	1,225	1,239	1,272	1,310	1,344	1,355	1,358	1,360	1,361	1,355
25 to 29 years old	1,304	1,420	1,415	1,417	1,415	1,427	1,462	1,518	1,574	1,627	1,670	1,700	1,705
30 to 34 years old	882	961	932	952	975	1,002	1,035	1,072	1,099	1,123	1,146	1,171	1,191
35 years old and over	2,297	2,368	2,430	2,398	2,377	2,388	2,436	2,510	2,575	2,644	2,714	2,789	2,841
<b>Men</b>	<b>2,786</b>	<b>2,955</b>	<b>3,019</b>	<b>3,032</b>	<b>3,030</b>	<b>3,037</b>	<b>3,066</b>	<b>3,105</b>	<b>3,131</b>	<b>3,155</b>	<b>3,179</b>	<b>3,202</b>	<b>3,218</b>
14 to 17 years old	17	19	21	21	21	20	20	20	21	21	21	22	22
18 and 19 years old	273	278	304	301	296	292	289	288	285	284	285	288	293
20 and 21 years old	328	342	350	360	363	359	356	352	350	348	345	343	344
22 to 24 years old	467	485	506	511	516	527	538	545	544	540	537	533	528
25 to 29 years old	549	602	593	595	592	592	599	614	629	643	654	660	658
30 to 34 years old	373	414	413	422	431	439	449	459	465	470	475	479	485
35 years old and over	779	814	831	821	811	808	815	827	837	848	862	877	888
<b>Women</b>	<b>4,192</b>	<b>4,401</b>	<b>4,465</b>	<b>4,471</b>	<b>4,484</b>	<b>4,547</b>	<b>4,666</b>	<b>4,828</b>	<b>4,964</b>	<b>5,091</b>	<b>5,210</b>	<b>5,330</b>	<b>5,403</b>
14 to 17 years old	24	12	20	20	20	20	20	20	21	22	23	24	24
18 and 19 years old	337	357	370	368	363	359	359	363	365	367	372	379	387
20 and 21 years old	387	409	428	439	445	444	444	446	449	452	453	454	458
22 to 24 years old	662	703	708	714	723	746	773	799	811	818	823	828	827
25 to 29 years old	755	818	822	822	823	835	862	904	945	984	1,016	1,041	1,047
30 to 34 years old	509	547	519	530	545	563	586	613	634	653	672	692	707
35 years old and over	1,518	1,554	1,598	1,577	1,566	1,580	1,621	1,683	1,738	1,796	1,853	1,912	1,953

NOTE: Detail may not sum to totals because of rounding. Some data have been revised from previously published figures. Data by age group are based on the distribution by age from the Census Bureau. Mean absolute percentage errors of selected education statistics can be found in table A-2, appendix A.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System, "Fall Enrollment Survey" (IPEDS-EF:94-99), and Spring 2001 through Spring 2009; Enrollment in Degree-Granting Institutions Model, 1980-2008; and U.S. Department of Commerce, Census Bureau, Current Population Reports, "Social and Economic Characteristics of Students," various years. (This table was prepared February 2010.)

**Table 22. Actual and projected numbers for enrollment in all degree-granting institutions, by sex and attendance status: Fall 1994 through fall 2019**

Year	[In thousands]				
	Total	Men		Women	
		Full-time	Part-time	Full-time	Part-time
<b>Actual</b>					
1994	14,279	3,855	2,517	4,283	3,624
1995	14,262	3,807	2,535	4,321	3,598
1996	14,368	3,851	2,502	4,452	3,563
1997	14,502	3,890	2,506	4,548	3,559
1998	14,507	3,934	2,436	4,630	3,508
1999	14,791	4,026	2,465	4,761	3,540
2000	15,312	4,111	2,611	4,899	3,692
2001	15,928	4,300	2,661	5,148	3,820
2002	16,612	4,501	2,701	5,445	3,964
2003	16,911	4,638	2,622	5,688	3,963
2004	17,272	4,739	2,648	5,871	4,014
2005	17,487	4,803	2,653	5,994	4,038
2006	17,759	4,879	2,695	6,078	4,106
2007	18,248	5,029	2,786	6,240	4,192
2008	19,103	5,234	2,955	6,513	4,401
<b>Projected</b>					
2009	19,525	5,433	3,019	6,609	4,465
2010	19,641	5,479	3,032	6,660	4,471
2011	19,713	5,483	3,030	6,716	4,484
2012	19,892	5,501	3,037	6,806	4,547
2013	20,230	5,558	3,066	6,941	4,666
2014	20,709	5,652	3,105	7,123	4,828
2015	21,082	5,719	3,131	7,268	4,964
2016	21,436	5,781	3,155	7,408	5,091
2017	21,779	5,842	3,179	7,548	5,210
2018	22,139	5,908	3,202	7,699	5,330
2019	22,408	5,966	3,218	7,821	5,403

NOTE: Detail may not sum to totals because of rounding. Some data have been revised from previously published figures. Mean absolute percentage errors of selected education statistics can be found in table A-2, appendix A.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System, "Fall Enrollment Survey" (IPEDS-EF:94-99), and Spring 2001 through Spring 2009; and Enrollment in Degree-Granting Institutions Model, 1980-2008. (This table was prepared February 2010.)

**Table 23. Actual and projected numbers for enrollment in public 4-year degree-granting institutions, by sex and attendance status: Fall 1994 through fall 2019**

Year	[In thousands]				
	Total	Men		Women	
		Full-time	Part-time	Full-time	Part-time
<b>Actual</b>					
1994	5,825	1,966	738	2,100	1,022
1995	5,815	1,951	720	2,134	1,009
1996	5,806	1,943	703	2,163	997
1997	5,835	1,951	687	2,214	984
1998	5,892	1,959	685	2,260	988
1999	5,970	1,984	686	2,309	991
2000	6,055	2,009	683	2,363	1,001
2001	6,236	2,082	687	2,450	1,017
2002	6,482	2,167	706	2,557	1,052
2003	6,649	2,225	713	2,639	1,072
2004	6,737	2,260	717	2,684	1,076
2005	6,838	2,295	724	2,726	1,091
2006	6,955	2,339	740	2,765	1,111
2007	7,167	2,418	773	2,827	1,149
2008	7,332	2,488	789	2,890	1,165
<b>Projected</b>					
2009	7,567	2,594	814	2,971	1,188
2010	7,623	2,619	817	2,997	1,189
2011	7,658	2,623	817	3,025	1,193
2012	7,730	2,633	820	3,066	1,212
2013	7,860	2,660	829	3,125	1,246
2014	8,042	2,705	841	3,205	1,291
2015	8,184	2,737	850	3,267	1,330
2016	8,318	2,766	858	3,328	1,366
2017	8,445	2,793	865	3,387	1,400
2018	8,580	2,823	872	3,452	1,433
2019	8,682	2,849	876	3,504	1,453

NOTE: Detail may not sum to totals because of rounding. Some data have been revised from previously published figures. Mean absolute percentage errors of selected education statistics can be found in table A-2, appendix A.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System, "Fall Enrollment Survey" (IPEDS-EF:94-99), and Spring 2001 through Spring 2009; and Enrollment in Degree-Granting Institutions Model, 1980-2008. (This table was prepared February 2010.)

**Table 24. Actual and projected numbers for enrollment in public 2-year degree-granting institutions, by sex and attendance status: Fall 1994 through fall 2019**

Year	[In thousands]				
	Total	Men		Women	
		Full-time	Part-time	Full-time	Part-time
<b>Actual</b>					
1994	5,308	848	1,379	1,038	2,044
1995	5,278	819	1,417	1,022	2,020
1996	5,314	833	1,423	1,039	2,019
1997	5,361	842	1,444	1,049	2,026
1998	5,246	841	1,383	1,040	1,981
1999	5,339	868	1,404	1,063	2,005
2000	5,697	891	1,549	1,109	2,148
2001	5,997	962	1,596	1,194	2,245
2002	6,270	1,035	1,605	1,299	2,332
2003	6,209	1,060	1,515	1,346	2,288
2004	6,244	1,065	1,518	1,360	2,300
2005	6,184	1,055	1,514	1,332	2,283
2006	6,225	1,067	1,533	1,325	2,300
2007	6,324	1,099	1,568	1,343	2,314
2008	6,640	1,152	1,672	1,396	2,420
<b>Projected</b>					
2009	6,843	1,194	1,715	1,444	2,489
2010	6,870	1,201	1,723	1,451	2,494
2011	6,881	1,199	1,722	1,459	2,501
2012	6,933	1,199	1,724	1,476	2,533
2013	7,046	1,209	1,738	1,504	2,595
2014	7,210	1,228	1,757	1,544	2,681
2015	7,338	1,241	1,770	1,576	2,752
2016	7,461	1,254	1,781	1,607	2,819
2017	7,582	1,268	1,792	1,641	2,882
2018	7,711	1,285	1,804	1,677	2,945
2019	7,807	1,301	1,813	1,708	2,985

NOTE: Detail may not sum to totals because of rounding. Some data have been revised from previously published figures. Mean absolute percentage errors of selected education statistics can be found in table A-2, appendix A.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System, "Fall Enrollment Survey" (IPEDS-EF:94-99), and Spring 2001 through Spring 2009; and Enrollment in Degree-Granting Institutions Model, 1980-2008. (This table was prepared February 2010.)

**Table 25. Actual and projected numbers for enrollment in private 4-year degree-granting institutions, by sex and attendance status: Fall 1994 through fall 2019**

Year	[In thousands]				
	Total	Men		Women	
		Full-time	Part-time	Full-time	Part-time
<b>Actual</b>					
1994	2,924	978	367	1,063	516
1995	2,955	978	364	1,089	523
1996	2,998	991	356	1,133	518
1997	3,061	1,008	360	1,170	523
1998	3,126	1,038	353	1,220	514
1999	3,229	1,073	360	1,276	519
2000	3,308	1,107	365	1,315	522
2001	3,441	1,151	365	1,389	536
2002	3,601	1,199	377	1,468	557
2003	3,768	1,250	382	1,561	574
2004	3,990	1,313	400	1,670	607
2005	4,162	1,354	402	1,774	632
2006	4,285	1,381	411	1,830	664
2007	4,464	1,422	433	1,911	698
2008	4,800	1,496	480	2,041	782
<b>Projected</b>					
2009	4,785	1,540	475	2,016	754
2010	4,818	1,554	477	2,033	754
2011	4,842	1,557	477	2,052	757
2012	4,894	1,564	479	2,083	768
2013	4,985	1,583	484	2,127	790
2014	5,109	1,612	492	2,185	820
2015	5,206	1,633	497	2,231	845
2016	5,299	1,652	502	2,275	869
2017	5,386	1,670	507	2,318	891
2018	5,476	1,688	511	2,364	912
2019	5,541	1,703	514	2,398	925

NOTE: Detail may not sum to totals because of rounding. Some data have been revised from previously published figures. Mean absolute percentage errors of selected education statistics can be found in table A-2, appendix A.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System, "Fall Enrollment Survey" (IPEDS-EF:94-99), and Spring 2001 through Spring 2009; and Enrollment in Degree-Granting Institutions Model, 1980-2008. (This table was prepared February 2010.)

**Table 26. Actual and projected numbers for enrollment in private 2-year degree-granting institutions, by sex and attendance status: Fall 1994 through fall 2019**

[In thousands]

Year	Total	Men		Women		
		Full-time	Part-time	Full-time	Part-time	
<b>Actual</b>						
1994	221	64	33	82	43	
1995	215	60	33	77	45	
1996	249	84	19	117	29	
1997	245	89	14	115	26	
1998	243	95	14	109	25	
1999	253	101	15	112	25	
2000	251	105	13	112	21	
2001	254	105	12	114	22	
2002	259	101	13	122	23	
2003	285	103	13	142	28	
2004	302	101	13	156	31	
2005	304	99	12	161	32	
2006	293	93	11	159	30	
2007	294	91	12	159	31	
2008	331	98	14	186	33	
<b>Projected</b>						
2009	329	104	14	178	33	
2010	331	105	14	179	33	
2011	332	105	14	180	33	
2012	334	105	14	182	34	
2013	339	106	14	185	35	
2014	347	107	14	190	36	
2015	353	108	14	194	37	
2016	359	109	15	198	38	
2017	366	111	15	202	38	
2018	373	112	15	206	39	
2019	378	114	15	210	40	

NOTE: Detail may not sum to totals because of rounding. Some data have been revised from previously published figures. Mean absolute percentage errors of selected education statistics can be found in table A-2, appendix A.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System, "Fall Enrollment Survey" (IPEDS-EF:94-99), and Spring 2001 through Spring 2009; and Enrollment in Degree-Granting Institutions Model, 1980-2008. (This table was prepared February 2010.)



**Table 27. Actual and projected numbers for undergraduate enrollment in all degree-granting institutions, by sex, attendance status, and control of institution: Fall 1994 through fall 2019**

[In thousands]

Year	Total	Sex		Attendance status		Control	
		Men	Women	Full-time	Part-time	Public	Private
<b>Actual</b>							
1994	12,263	5,422	6,840	7,169	5,094	9,945	2,317
1995	12,232	5,401	6,831	7,145	5,086	9,904	2,328
1996	12,327	5,421	6,906	7,299	5,028	9,935	2,392
1997	12,451	5,469	6,982	7,419	5,032	10,007	2,443
1998	12,437	5,446	6,991	7,539	4,898	9,950	2,487
1999	12,681	5,559	7,122	7,735	4,946	10,110	2,571
2000	13,155	5,778	7,377	7,923	5,232	10,539	2,616
2001	13,716	6,004	7,711	8,328	5,388	10,986	2,730
2002	14,257	6,192	8,065	8,734	5,523	11,433	2,824
2003	14,480	6,227	8,253	9,045	5,435	11,523	2,957
2004	14,781	6,340	8,441	9,284	5,496	11,651	3,130
2005	14,964	6,409	8,555	9,446	5,518	11,698	3,266
2006	15,184	6,514	8,671	9,571	5,613	11,847	3,337
2007	15,604	6,728	8,876	9,841	5,763	12,138	3,466
2008	16,366	7,067	9,299	10,255	6,111	12,591	3,775
<b>Projected</b>							
2009	16,706	7,270	9,436	10,506	6,199	12,988	3,718
2010	16,814	7,324	9,489	10,594	6,219	13,066	3,748
2011	16,871	7,325	9,546	10,642	6,230	13,105	3,766
2012	17,003	7,340	9,663	10,718	6,284	13,206	3,796
2013	17,261	7,402	9,860	10,862	6,399	13,409	3,852
2014	17,636	7,504	10,132	11,078	6,558	13,704	3,932
2015	17,923	7,573	10,350	11,240	6,683	13,930	3,993
2016	18,198	7,637	10,561	11,398	6,800	14,146	4,052
2017	18,468	7,702	10,766	11,558	6,910	14,359	4,109
2018	18,760	7,774	10,986	11,740	7,020	14,588	4,173
2019	18,995	7,841	11,155	11,904	7,091	14,769	4,227

NOTE: Detail may not sum to totals because of rounding. Some data have been revised from previously published figures. Mean absolute percentage errors of selected education statistics can be found in table A-2, appendix A.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System, "Fall Enrollment Survey" (IPEDS-EF:94-99), and Spring 2001 through Spring 2009; and Enrollment in Degree-Granting Institutions Model, 1980-2008. (This table was prepared February 2010.)

**Table 28. Actual and projected numbers for postbaccalaureate enrollment in all degree-granting institutions, by sex, attendance status, and control of institution: Fall 1994 through fall 2019**

[In thousands]

Year	Total	Sex		Attendance status		Control	
		Men	Women	Full-time	Part-time	Public	Private
<b>Actual</b>							
1994	2,016	950	1,066	969	1,047	1,189	828
1995	2,030	941	1,088	984	1,046	1,189	841
1996	2,041	932	1,108	1,004	1,036	1,185	855
1997	2,052	927	1,124	1,019	1,032	1,189	863
1998	2,070	923	1,147	1,025	1,045	1,188	882
1999	2,110	931	1,179	1,051	1,058	1,199	911
2000	2,157	943	1,213	1,087	1,070	1,213	943
2001	2,212	956	1,256	1,120	1,092	1,247	965
2002	2,355	1,010	1,345	1,212	1,142	1,319	1,035
2003	2,431	1,033	1,398	1,281	1,150	1,336	1,096
2004	2,491	1,047	1,444	1,326	1,165	1,330	1,162
2005	2,524	1,047	1,476	1,351	1,173	1,324	1,199
2006	2,575	1,061	1,513	1,386	1,188	1,333	1,242
2007	2,644	1,088	1,556	1,429	1,215	1,353	1,291
2008	2,737	1,122	1,615	1,493	1,244	1,381	1,356
<b>Projected</b>							
2009	2,819	1,181	1,638	1,535	1,284	1,423	1,396
2010	2,827	1,186	1,641	1,544	1,283	1,427	1,401
2011	2,841	1,187	1,653	1,557	1,284	1,433	1,408
2012	2,889	1,199	1,690	1,589	1,300	1,457	1,432
2013	2,969	1,222	1,747	1,637	1,332	1,497	1,472
2014	3,073	1,252	1,820	1,697	1,375	1,549	1,524
2015	3,159	1,277	1,881	1,747	1,412	1,592	1,567
2016	3,239	1,299	1,939	1,792	1,447	1,632	1,606
2017	3,311	1,319	1,992	1,831	1,479	1,669	1,642
2018	3,379	1,336	2,043	1,867	1,511	1,703	1,676
2019	3,413	1,343	2,069	1,883	1,530	1,720	1,692

NOTE: Detail may not sum to totals because of rounding. Some data have been revised from previously published figures. Mean absolute percentage errors of selected education statistics can be found in table A-2, appendix A.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System, "Fall Enrollment Survey" (IPEDS-EF:94-99), and Spring 2001 through Spring 2009; and Enrollment in Degree-Granting Institutions Model, 1980-2008. (This table was prepared February 2010.)

**Table 29. Actual and projected numbers for enrollment in all degree-granting institutions, by race/ethnicity: Fall 1994 through fall 2019**

[In thousands]

Year	Total	Race/ethnicity					Nonresident alien <sup>1</sup>
		White	Black	Hispanic	Asian/Pacific Islander	American Indian/ Alaska Native	
<b>Actual</b>							
1994	14,279	10,427	1,449	1,046	774	127	456
1995	14,262	10,311	1,474	1,094	797	131	454
1996	14,368	10,264	1,506	1,166	828	138	466
1997	14,502	10,266	1,551	1,218	859	142	465
1998	14,507	10,179	1,583	1,257	900	144	444
1999	14,791	10,282	1,643	1,319	913	145	488
2000	15,312	10,462	1,730	1,462	978	151	529
2001	15,928	10,775	1,850	1,561	1,019	158	565
2002	16,612	11,140	1,979	1,662	1,074	166	591
2003	16,911	11,281	2,068	1,716	1,076	173	598
2004	17,272	11,423	2,165	1,810	1,109	176	590
2005	17,487	11,495	2,215	1,882	1,134	176	585
2006	17,759	11,572	2,280	1,964	1,165	181	596
2007	18,248	11,756	2,383	2,076	1,218	190	624
2008	19,103	12,089	2,584	2,273	1,303	193	661
<b>Projected</b>							
2009	19,525	12,338	2,645	2,317	1,332	197	696
2010	19,641	12,354	2,666	2,352	1,355	198	717
2011	19,713	12,292	2,709	2,411	1,375	196	729
2012	19,892	12,281	2,776	2,491	1,405	195	743
2013	20,230	12,364	2,865	2,597	1,444	196	763
2014	20,709	12,530	2,971	2,726	1,495	198	790
2015	21,082	12,622	3,061	2,845	1,539	199	815
2016	21,436	12,704	3,147	2,962	1,583	200	840
2017	21,779	12,785	3,229	3,075	1,623	201	864
2018	22,139	12,880	3,312	3,194	1,663	202	888
2019	22,408	12,933	3,370	3,298	1,698	203	908

<sup>1</sup> The racial/ethnic backgrounds of nonresident aliens are not known.

NOTE: Race categories exclude persons of Hispanic ethnicity. Enrollment data in the "race/ethnicity unknown" category of the IPEDS "Fall Enrollment Survey" have been prorated to the other race/ethnicity categories at the institutional level. Detail may not sum to totals because of rounding. Mean absolute percentage errors of selected education statistics can be found in table A-2, appendix A.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System, "Fall Enrollment Survey" (IPEDS-EF:94-99), and Spring 2001 through Spring 2008; and Enrollment in Degree-Granting Institutions by Race/Ethnicity Model, 1980-2008. (This table was prepared February 2010.)

**Table 30. Actual and projected numbers for full-time-equivalent enrollment in all degree-granting institutions, by control and type of institution: Fall 1994 through fall 2019**

[In thousands]

Year	Total	Public		Private	
		4-year	2-year	4-year	2-year
<b>Actual</b>					
1994	10,349	4,750	3,035	2,389	176
1995	10,337	4,757	2,994	2,418	168
1996	10,482	4,767	3,028	2,467	219
1997	10,615	4,814	3,056	2,525	220
1998	10,699	4,869	3,011	2,599	220
1999	10,944	4,945	3,075	2,694	229
2000	11,267	5,026	3,241	2,770	231
2001	11,766	5,194	3,445	2,894	233
2002	12,331	5,406	3,655	3,033	237
2003	12,689	5,558	3,684	3,186	260
2004	13,001	5,641	3,707	3,377	276
2005	13,201	5,728	3,662	3,533	277
2006	13,403	5,825	3,679	3,631	268
2007	13,783	5,994	3,745	3,775	268
2008	14,394	6,140	3,922	4,030	302
<b>Projected</b>					
2009	14,733	6,346	4,050	4,036	301
2010	14,837	6,398	4,068	4,068	302
2011	14,901	6,431	4,076	4,091	303
2012	15,036	6,491	4,105	4,135	305
2013	15,280	6,594	4,168	4,208	310
2014	15,629	6,741	4,262	4,310	317
2015	15,899	6,853	4,335	4,389	323
2016	16,157	6,960	4,405	4,464	328
2017	16,408	7,062	4,478	4,534	334
2018	16,678	7,172	4,556	4,609	340
2019	16,889	7,260	4,620	4,664	345

NOTE: Detail may not sum to totals because of rounding. Some data have been revised from previously published figures. Mean absolute percentage errors of selected education statistics can be found in table A-2, appendix A.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System, "Fall Enrollment Survey" (IPEDS-EF:94-99), and Spring 2001 through Spring 2009; and Enrollment in Degree-Granting Institutions Model, 1980-2008. (This table was prepared February 2010.)

**Table 31. Actual and projected numbers for associate's degrees by degree-granting institutions, by sex of recipient: 1994–95 through 2019–20**

Year	Total	Men	Women
<b>Actual</b>			
1994–95	539,691	218,352	321,339
1995–96	555,216	219,514	335,702
1996–97	571,226	223,948	347,278
1997–98	558,555	217,613	340,942
1998–99	559,954	218,417	341,537
1999–2000	564,933	224,721	340,212
2000–01	578,865	231,645	347,220
2001–02	595,133	238,109	357,024
2002–03	634,016	253,451	380,565
2003–04	665,301	260,033	405,268
2004–05	696,660	267,536	429,124
2005–06	713,066	270,095	442,971
2006–07	728,114	275,187	452,927
2007–08	750,164	282,521	467,643
<b>Projected</b>			
2008–09	773,000	289,000	484,000
2009–10	797,000	297,000	500,000
2010–11	818,000	303,000	515,000
2011–12	833,000	307,000	526,000
2012–13	845,000	309,000	535,000
2013–14	858,000	312,000	547,000
2014–15	876,000	315,000	561,000
2015–16	895,000	319,000	576,000
2016–17	915,000	323,000	592,000
2017–18	934,000	326,000	608,000
2018–19	955,000	330,000	624,000
2019–20	975,000	334,000	641,000

NOTE: Some data have been revised from previously published figures. Detail may not sum to totals because of rounding. Mean absolute percentage errors of selected education statistics can be found in table A-2, appendix A.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System, "Completions Survey" (IPEDS-C:95–99), and Fall 2000 through Fall 2008; and Degrees Conferred Model, 1975–76 through 2007–08. (This table was prepared February 2010.)

**Table 32. Actual and projected numbers for bachelor's degrees by degree-granting institutions, by sex of recipient: 1994–95 through 2019–20**

Year	Total	Men	Women
<b>Actual</b>			
1994–95	1,160,134	526,131	634,003
1995–96	1,164,792	522,454	642,338
1996–97	1,172,879	520,515	652,364
1997–98	1,184,406	519,956	664,450
1998–99	1,200,303	518,746	681,557
1999–2000	1,237,875	530,367	707,508
2000–01	1,244,171	531,840	712,331
2001–02	1,291,900	549,816	742,084
2002–03	1,348,811	573,258	775,553
2003–04	1,399,542	595,425	804,117
2004–05	1,439,264	613,000	826,264
2005–06	1,485,242	630,600	854,642
2006–07	1,524,092	649,570	874,522
2007–08	1,563,069	667,928	895,141
<b>Projected</b>			
2008–09	1,607,000	687,000	921,000
2009–10	1,652,000	711,000	941,000
2010–11	1,696,000	732,000	964,000
2011–12	1,725,000	749,000	976,000
2012–13	1,744,000	755,000	989,000
2013–14	1,762,000	759,000	1,003,000
2014–15	1,786,000	765,000	1,021,000
2015–16	1,812,000	773,000	1,039,000
2016–17	1,844,000	784,000	1,060,000
2017–18	1,871,000	792,000	1,079,000
2018–19	1,899,000	800,000	1,099,000
2019–20	1,926,000	809,000	1,117,000

NOTE: Some data have been revised from previously published figures. Detail may not sum to totals because of rounding. Mean absolute percentage errors of selected education statistics can be found in table A-2, appendix A.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System, "Completions Survey" (IPEDS-C:95–99), and Fall 2000 through Fall 2008; and Degrees Conferred Model, 1975–76 through 2007–08. (This table was prepared February 2010.)

**Table 33. Actual and projected numbers for master's degrees by degree-granting institutions, by sex of recipient: 1994–95 through 2019–20**

Year	Total	Men	Women
<b>Actual</b>			
1994–95	397,629	178,598	219,031
1995–96	406,301	179,081	227,220
1996–97	419,401	180,947	238,454
1997–98	430,164	184,375	245,789
1998–99	439,986	186,148	253,838
1999–2000	457,056	191,792	265,264
2000–01	468,476	194,351	274,125
2001–02	482,118	199,120	282,998
2002–03	513,339	211,664	301,675
2003–04	558,940	229,545	329,395
2004–05	574,618	233,590	341,028
2005–06	594,065	237,896	356,169
2006–07	604,607	238,189	366,418
2007–08	625,023	246,491	378,532
<b>Projected</b>			
2008–09	649,000	256,000	393,000
2009–10	670,000	270,000	400,000
2010–11	687,000	280,000	407,000
2011–12	696,000	281,000	416,000
2012–13	709,000	283,000	426,000
2013–14	727,000	289,000	439,000
2014–15	750,000	297,000	453,000
2015–16	771,000	306,000	466,000
2016–17	791,000	313,000	478,000
2017–18	809,000	319,000	490,000
2018–19	827,000	324,000	502,000
2019–20	839,000	328,000	512,000

NOTE: Some data have been revised from previously published figures. Detail may not sum to totals because of rounding. Mean absolute percentage errors of selected education statistics can be found in table A-2, appendix A.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System, "Completions Survey" (IPEDS-C:95–99), and Fall 2000 through Fall 2008; and Degrees Conferred Model, 1975–76 through 2007–08. (This table was prepared February 2010.)

**Table 34. Actual and projected numbers for doctor's degrees by degree-granting institutions, by sex of recipient: 1994–95 through 2019–20**

Year	Total	Men	Women
<b>Actual</b>			
1994–95	44,446	26,916	17,530
1995–96	44,652	26,841	17,811
1996–97	45,876	27,146	18,730
1997–98	46,010	26,664	19,346
1998–99	44,077	25,146	18,931
1999–2000	44,808	25,028	19,780
2000–01	44,904	24,728	20,176
2001–02	44,160	23,708	20,452
2002–03	46,042	24,351	21,691
2003–04	48,378	25,323	23,055
2004–05	52,631	26,973	25,658
2005–06	56,067	28,634	27,433
2006–07	60,616	30,251	30,365
2007–08	63,712	31,215	32,497
<b>Projected</b>			
2008–09	65,900	32,000	33,900
2009–10	68,800	33,100	35,800
2010–11	71,700	34,100	37,700
2011–12	74,700	35,100	39,500
2012–13	77,600	36,200	41,400
2013–14	80,500	37,200	43,300
2014–15	83,400	38,200	45,100
2015–16	86,300	39,300	47,000
2016–17	89,200	40,300	48,900
2017–18	92,100	41,400	50,700
2018–19	95,000	42,400	52,600
2019–20	97,900	43,400	54,500

NOTE: Some data have been revised from previously published figures. Detail may not sum to totals because of rounding. Mean absolute percentage errors of selected education statistics can be found in table A-2, appendix A.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System, "Completions Survey" (IPEDS-C:95–99), and Fall 2000 through Fall 2008; and Degrees Conferred Model, 1975–76 through 2007–08. (This table was prepared February 2010.)



**Table 35. Actual and projected numbers for first-professional degrees by degree-granting institutions, by sex of recipient: 1994–95 through 2019–20**

Year	Total	Men	Women
<b>Actual</b>			
1994–95	75,800	44,853	30,947
1995–96	76,734	44,748	31,986
1996–97	78,730	45,564	33,166
1997–98	78,598	44,911	33,687
1998–99	78,439	44,339	34,100
1999–2000	80,057	44,239	35,818
2000–01	79,707	42,862	36,845
2001–02	80,698	42,507	38,191
2002–03	80,897	41,887	39,010
2003–04	83,041	42,169	40,872
2004–05	87,289	43,849	43,440
2005–06	87,655	44,038	43,617
2006–07	90,064	45,057	45,007
2007–08	91,309	45,916	45,393
<b>Projected</b>			
2008–09	93,900	47,300	46,600
2009–10	97,100	48,800	48,200
2010–11	100,700	51,000	49,700
2011–12	102,300	52,100	50,200
2012–13	103,100	52,300	50,700
2013–14	104,600	52,900	51,700
2014–15	107,200	53,800	53,300
2015–16	110,600	55,200	55,400
2016–17	113,900	56,500	57,400
2017–18	116,900	57,600	59,200
2018–19	119,500	58,600	60,900
2019–20	121,900	59,400	62,500

NOTE: Some data have been revised from previously published figures. Detail may not sum to totals because of rounding. Mean absolute percentage errors of selected education statistics can be found in table A-2, appendix A.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System, “Completions Survey” (IPEDS-C:95–99), and Fall 2000 through Fall 2008; and Degrees Conferred Model, 1975–76 through 2007–08. (This table was prepared February 2010.)

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# Technical Appendixes

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# Appendix A

## *Introduction to Projection Methodology*

### A.0. INTRODUCTION TO PROJECTION METHODOLOGY

#### Content of appendix A

Since its inception in 1964, the *Projections of Education Statistics* series has been providing projections of key education statistics to policy makers, educators, researchers, the press, and the general public. This edition of *Projections of Education Statistics* is the thirty-eighth in the series.

Appendix A contains this introduction, which provides a general overview of the projection methodology, as well as six additional sections, which discuss the specific methodology for the different statistics projected. Appendix A contains seven sections:

- » A.0. Introduction to Projection Methodology;
- » A.1. Elementary and Secondary Enrollment;
- » A.2. High School Graduates;
- » A.3. Elementary and Secondary Teachers;
- » A.4. Expenditures for Public Elementary and Secondary Education;
- » A.5. Enrollment in Postsecondary Degree-Granting Institutions; and
- » A.6. Postsecondary Degrees Conferred.

This introduction

- » outlines the two major techniques used to make the projections;
- » summarizes key demographic and economic assumptions underlying the projections;
- » examines the accuracy of the projections; and
- » introduces the subsequent sections of appendix A.

#### Projection techniques

Two major projection techniques were used to develop the projections presented in this publication:

- » *Exponential smoothing* was the technique used in the projections of elementary and secondary enrollments and high school graduates. This technique also played a role in the projections of teachers at the elementary and secondary level, as well as enrollments and degrees conferred at the postsecondary level.
- » *Multiple linear regression* was the primary technique used in the projections of teachers and expenditures at the elementary and secondary level, as well as enrollments and degrees conferred at the postsecondary level.

#### *Exponential smoothing*

Two different types of exponential smoothing, single exponential smoothing and double exponential smoothing, were used in producing the projections presented in this publication.

Single exponential smoothing was used when the historical data had a basically horizontal pattern. Single exponential smoothing produces a single forecast for all years in the forecast period. In developing projections of elementary and secondary enrollments, for example, the rate at which students progress from one particular grade to the next (e.g., from grade 2 to grade 3) was projected using single exponential smoothing. Thus, this percentage was assumed to be constant over the forecast period.

In general, exponential smoothing places more weight on recent observations than on earlier ones. The weights for observations decrease exponentially as one moves further into the past. As a result, the older data have less influence on the projections. The rate at which the weights of older observations decrease is determined by the smoothing constant.

When using single exponential smoothing for a time series,  $P_t$ , a smoothed series,  $\hat{P}_t$ , is computed recursively by evaluating

$$\hat{P}_t = \alpha P_t + (1 - \alpha) \hat{P}_{t-1}$$

where  $0 < \alpha \leq 1$  is the smoothing constant.

By repeated substitution, we can rewrite the equation as

$$\hat{P}_t = \alpha \sum_{s=0}^{t-1} (1 - \alpha)^s P_{t-s}$$

where time,  $s$ , goes from the first period in the time series, 0, to time period  $t-1$ .

The forecasts are constant for all years in the forecast period. The constant equals

$$\hat{P}_{T+k} = \hat{P}_T$$

where  $T$  is the last year in the estimation sample and  $k > 0$ .

These equations illustrate that the projection is a weighted average based on exponentially decreasing weights. For higher smoothing constants, weights for earlier observations decrease more rapidly than for lower smoothing constants.

Double exponential smoothing with one smoothing constant was used when the time series was expected to change linearly with time. Double exponential smoothing produces different forecasts for different years in the forecast period, reflecting trend patterns. This technique was used to forecast the number of doctor's degrees awarded to men and women.

Double exponential smoothing with one smoothing constant applies the single smoothing method twice (using the same parameter). Double smoothing of a series  $P_t$  is defined by the recursions:

$$S_t = \alpha P_t + (1 - \alpha) S_{t-1}$$

$$D_t = \alpha S_t + (1 - \alpha) D_{t-1}$$

where:

$S_t$  = the single smoothed series;

$D_t$  = the double smoothed series; and

$0 < \alpha \leq 1$

Note that double smoothing is a single parameter smoothing method with a damping factor  $\alpha$ .

Forecasts from double smoothing are computed as

$$\begin{aligned} \hat{P}_{T+k} &= \left( 2 + \frac{\alpha k}{(1 - \alpha)} \right) S_T - \left( 1 + \frac{\alpha k}{(1 - \alpha)} \right) T_T \\ &= \left( 2S_T - D_T + \frac{\alpha}{(1 - \alpha)} (S_T - D_T)k \right) \end{aligned}$$

where  $T$  is the last year in the estimation sample and  $k > 0$ . The last expression shows that forecasts from double smoothing lie on a linear trend with intercept  $2S_T - D_T$  and slope  $\alpha(S_T - D_T)/(1 - \alpha)$ .

As with previous editions of the *Projections of Education Statistics*, a smoothing constant of 0.4 was used for both single and double exponential smoothing. For more information about exponential smoothing, see Diebold (2001).

### Multiple linear regression

Multiple linear regression was used in cases where a strong relationship exists between the variable being projected (the dependent variable) and independent variables. This technique can be used only when accurate data and reliable projections of the independent variables are available. Key independent variables for this publication include demographic and economic factors. For example, current expenditures for public elementary and secondary education are related to economic factors such as disposable income and education revenues from state sources. The sources of the demographic and economic projections used for this publication are discussed below, under “Assumptions.”

The equations in this appendix should be viewed as forecasting rather than structural equations. That is, the equations are intended only to project values for the dependent variables, not to reflect all elements of underlying social, political, and economic structures. Available data precluded the building of large-scale structural models. The particular equations shown were selected on the basis of their statistical properties, such as coefficients of determination ( $R^2$ s), the  $t$ -statistics of the coefficients, the Durbin-Watson statistic, the Breusch-Godfrey Serial Correlation LM test statistic, and residual plots.

The functional form primarily used is the multiplicative model. When used with two independent variables, this model takes the form:

$$Y = X_1^{b_1} \cdot X_2^{b_2}$$

This equation can easily be transformed into the linear form by taking the natural log (ln) of both sides of the equation:

$$\ln(Y) = \ln(a) + b_1 \ln X_1 + b_2 \ln X_2$$

One property of this model is that the coefficient of an independent variable shows how responsive in percentage terms the dependent variable is to a one percent change in that independent variable (also called the elasticity). For example, a 1 percent change in  $X_1$  in the above equation would lead to a  $b_1$  percent change in  $Y$ .

### Assumptions

All projections are based on underlying assumptions, and these assumptions determine projection results to a large extent. It is important that users of projections understand the assumptions to determine the acceptability of projected time series for their purposes. All the projections in this publication are to some extent dependent on demographic and/or economic assumptions.

#### Demographic assumptions

Many of the projections in this publication are demographically based on the U.S. Census Bureau’s 2008 National Population Projections (August 2008) and the Interim State Population Projections (April 2005).

The two sets of Census Bureau population projections are produced using cohort-component models. In order for the national-level population projections by age, sex, and race/ethnicity to be consistent with the most recent historical estimates released by the Census Bureau, the projections were ratio-adjusted by applying the ratio of the last historical estimate to the corresponding projections year to the projections for each age, sex, and race/ethnicity combination. This allows for a consistent set of historical estimates and projections. For more information on the methodology used for Census Bureau population projections, see appendix C, Data Sources.

The enrollment projections in this publication depend on Census Bureau population projections for the various age groups that attend school. The future fertility rate assumption (along with corresponding projections of female populations) determines projections of the number of births, a key factor for population projections. The fertility rate assumption plays a major role in determining population projections for the age groups enrolled in nursery school, kindergarten, and elementary grades. The effects of the fertility rate assumption are more pronounced toward the end of the forecast period, while immigration assumptions affect all years. For enrollments in secondary grades and college, the fertility rate assumption is of no consequence, since all the population cohorts for these enrollment ranges have already been born.

## Economic assumptions

Various economic variables are used in the forecasting models for numbers of elementary and secondary teachers, public elementary and secondary school expenditures, and postsecondary enrollment.

The source of these variables is the trend scenario of the “U.S. Monthly Model November 2009: Short-Term Projections” developed by the economic consulting firm IHS Global Insight. The trend scenario depicts a mean of possible paths that the economy could take over the forecast period, barring major shocks. The economy, in this scenario, evolves smoothly, without major fluctuations.

## More information about specific assumptions

For details about the primary assumptions used in this edition of *Projections of Education Statistics*, see table A-1 on page 83.

## Accuracy of the projections

Projections of time series usually differ from the final reported data due to errors from many sources. This is because of the inherent nature of the statistical universe from which the basic data are obtained and the properties of projection methodologies, which depend on the validity of many assumptions.

The mean absolute percentage error (MAPE) is one way to express the forecast accuracy of past projections. This measure expresses the average absolute value of errors over past projections in percentage terms. For example, an analysis of projection errors over the past 25 editions of *Projections of Education Statistics* indicates that the MAPEs for public school enrollment in grades K–12 for lead times of 1, 2, 5, and 10 years were 0.3, 0.6, 1.3, and 2.3 percent, respectively. For the 1-year-out projection, this means that one would expect the projection to be within 0.3 percent of the actual value, on average.

For a list of MAPEs for selected national statistics in this publication, see table A-2 on page 84. Sections A.1 through A.5 each contain a text table (exhibits A-3 through A-7) that presents the MAPEs for the key national statistics of that section. Each exhibit appears directly after the discussion of accuracy of that section’s national projections. For a list of MAPEs by state and region for public elementary and secondary enrollment, see tables A-5 through A-7 on pages 92–97 and for a list of MAPEs by state and region for the number of high school graduates in public elementary and secondary schools, see table A-8 on pages 102–103.

Exhibits A-1 and A-2 present an example of how the MAPEs were constructed using actual values for national public elementary and secondary enrollment projections for schools years 2004 through 2007 and enrollment projections from the last four editions of the *Projections of Education Statistics*. The top panel of exhibit A-1 shows the actual values for school years 2004 through 2007 and enrollment projections for each year from the *Projections of Education Statistics to 2015* with the number of projections decreasing by one for each subsequent edition. The bottom panel of exhibit A-1 shows the percentage differences between the actual values and the projected values. For example, the projected value for 2004 presented in the *Projections of Education Statistics to 2005* was 0.5 lower than the actual value for that year.

The top panel of exhibit A-2 shows the absolute value of the percent differences from exhibit A-1 arranged by lead time rather than year. Hence, the 0.2 appearing in the column for lead times of 1 year and the row for projections from the *Projections of Education Statistics to 2016* indicates that projection of the one-year-out forecast from the *Projections of Education Statistics to 2016* differed by 0.2 in absolute terms from its actual value. The MAPE for each lead time show in the bottom panel of exhibit A-2 were calculated by computing the average of the absolute values of the percentage differences for that lead time. Unlike the MAPEs on exhibits A-3 through A-7 and appendix tables A-2 and A-5 through A-8, the MAPEs on exhibit A-2 are presented for illustrative purposes only. They are different from the MAPEs for public elementary and secondary enrollment projections elsewhere in this report because the MAPEs in the example were calculated using only the last 4 editions of the *Projections of Education Statistics*.

The number of years used in the analysis of the projection error differs by statistics both because projections of additional education statistics have been added to the report over time and because, for some statistics, there have been such a substantial change in the methodology used to produce the projections that the projections produced using the earlier methodology were not included in the analysis of the projection error.

**Exhibit A-1. Example of constructing mean absolute percentage errors, part 1**

Source	Year			
	2004	2005	2006	2007
	Enrollment in thousands			
Actual	48,795	49,113	49,316	49,293
	Projected enrollment in thousands			
<i>Projections of Education Statistics 2015</i>	48,560	48,710	48,948	49,091
<i>Projections of Education Statistics 2016</i>	†	49,028	49,370	49,610
<i>Projections of Education Statistics 2017</i>	†	†	49,464	49,644
<i>Projections of Education Statistics 2018</i>	†	†	†	49,470
	Percentage difference between actual and projected values			
<i>Projections of Education Statistics 2015</i>	-0.5	-0.8	-0.7	-0.4
<i>Projections of Education Statistics 2016</i>	†	-0.2	0.1	0.6
<i>Projections of Education Statistics 2017</i>	†	†	0.3	0.7
<i>Projections of Education Statistics 2018</i>	†	†	†	0.4

† Not applicable.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Common Core of Data (CCD), "State Nonfiscal Survey of Public Elementary/Secondary Education," 2004–05 through 2007–08; and *Projections of Education Statistics*, various editions. (This exhibit was prepared September 2010.)

**Exhibit A-2. Example of constructing mean absolute percentage errors, part 2**

Source	Lead time (years)			
	1	2	3	4
	Absolute value of percentage difference between actual and projected values			
<i>Projections of Education Statistics 2015</i>	0.5	0.8	0.7	0.4
<i>Projections of Education Statistics 2016</i>	0.2	0.1	0.6	†
<i>Projections of Education Statistics 2017</i>	0.3	0.7	†	†
<i>Projections of Education Statistics 2018</i>	0.4	†	†	†
	Mean absolute percentage error			
Example	0.3	0.5	0.7	0.4

† Not applicable.

NOTE: The mean absolute percentage errors presented on this table are for illustrative purpose only.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Common Core of Data (CCD), "State Nonfiscal Survey of Public Elementary/Secondary Education," 2004–05 through 2007–08; and *Projections of Education Statistics*, various editions. (This exhibit was prepared September 2010.)



**Table A-1. Summary of forecast assumptions to 2019**

Variable	Assumption
<b>Demographic variables</b>	
Population	Projections are consistent with the Census Bureau estimates <sup>1</sup>
18- to 24-year-old population	Census Bureau projection: average annual growth rate of 0.1%
25- to 29-year-old population	Census Bureau projection: average annual growth rate of 0.8%
30- to 34-year-old population	Census Bureau projection: average annual growth rate of 1.3%
35- to 44-year-old population	Census Bureau projection: average annual growth rate of 0.3%
<b>Economic variables</b>	
Disposable income per capita in constant dollars	Annual percent changes range between -0.7% and 2.6% with an annual growth rate of 1.5%
Education revenue receipts from state sources per capita in constant dollars	Annual percent changes range between -1.3% and 2.7% with an annual growth rate of 1.4%
Inflation rate	Inflation rate ranges between 0.9% and 2.1%
<b>Unemployment rate (men)</b>	
Ages 18 and 19	Remains between 20.1% and 30.3%
Ages 20 to 24	Remains between 11.7% and 18.7%
Age 25 and over	Remains between 5.0% and 8.3%
<b>Unemployment rate (women)</b>	
Ages 18 and 19	Remains between 14.6% and 20.6%
Ages 20 to 24	Remains between 8.9% and 12.9%
Age 25 and over	Remains between 4.5% and 6.7%

<sup>1</sup> As the Census projections were not updated to reflect 2008 Census Bureau population estimates, the Census Bureau age-specific population projections for each year were adjusted by multiplying the ratio of the total Census Bureau estimate for 2008 to the total Census Bureau projection for 2008.

SOURCE: U.S. Department of Commerce, Census Bureau, Population Estimates, retrieved October 13, 2009, from <http://www.census.gov/popest/national/asrh/2008-nat-af.html>; and Population Projections, retrieved November 2, 2009, from <http://www.census.gov/popest/national/asrh/2008-nat-af.html>; and IHS Global Insight, "U.S. Monthly Model November 2009 Short-Term Projections." (This table was prepared March 2010.)

**Table A-2. Mean absolute percentage errors (MAPEs) by lead time for selected statistics in all public elementary and secondary schools and degree-granting institutions: 2010**

Statistic	Lead time (years)									
	1	2	3	4	5	6	7	8	9	10
<b>Public elementary and secondary schools</b>										
Prekindergarten–12 enrollment <sup>1</sup>	0.3	0.6	0.8	1.1	1.3	1.5	1.8	1.9	2.1	2.3
Prekindergarten–8 enrollment <sup>1</sup>	0.4	0.7	0.9	1.2	1.4	1.7	2.0	2.4	2.8	3.1
9–12 enrollment <sup>1</sup>	0.4	0.7	0.9	1.1	1.3	1.6	2.0	2.3	2.3	2.2
High school graduates <sup>2</sup>	1.0	1.0	1.6	1.7	1.7	2.2	2.9	3.7	4.0	3.8
Elementary and secondary teachers <sup>3</sup>	1.0	1.4	1.7	2.4	3.0	3.6	3.9	4.4	5.1	6.3
Total current expenditures <sup>4</sup>	1.2	2.1	2.2	2.3	2.7	3.5	4.2	4.3	4.1	4.4
Current expenditures per pupil in fall enrollment <sup>4</sup>	1.2	2.0	2.0	2.3	3.1	3.7	4.7	4.9	5.6	5.8
<b>Private elementary and secondary schools<sup>5</sup></b>										
Prekindergarten–12 enrollment	3.4	4.6	3.7	6.1	5.5	6.0	0.5	1.0	—	—
Prekindergarten–8 enrollment	3.5	4.9	4.1	6.6	6.0	6.7	0.9	1.1	—	—
9–12 enrollment	3.0	3.8	2.3	4.5	3.6	3.5	0.7	0.7	—	—
High school graduates	0.9	0.9	2.0	2.8	5.9	5.6	2.2	2.2	—	—
<b>Degree-granting institutions<sup>6</sup></b>										
Total enrollment	1.4	2.4	2.9	3.4	4.6	6.1	8.0	9.8	10.1	10.4
Men	1.5	2.9	3.5	4.1	5.2	6.6	8.1	9.8	10.2	10.3
Women	1.5	2.4	3.0	3.2	4.2	5.8	7.9	9.8	9.9	10.4
4-year institutions	1.5	2.5	3.3	4.1	5.3	6.8	8.8	10.9	11.5	12.4
2-year institutions	2.0	3.4	3.8	4.0	4.8	5.0	6.6	7.8	7.6	6.9

— Not available.

<sup>1</sup> MAPEs for public PK–12 enrollments were calculated using the last 26 editions of *Projections of Education Statistics*.

<sup>2</sup> MAPEs for public high school graduates were calculated from the past 19 editions of *Projections of Education Statistics*.

<sup>3</sup> Data for teachers expressed in full-time equivalents. MAPEs for teachers were calculated from the past 19 editions containing teacher projections.

<sup>4</sup> In constant dollars based on the Consumer Price Index for all urban consumers, Bureau of Labor Statistics, U.S. Department of Labor. MAPEs for current expenditures were calculated using projections from the last 19 editions containing current expenditure projections.

<sup>5</sup> MAPEs for private PK–12 enrollments and high school graduates were calculated from the past eight editions.

<sup>6</sup> MAPEs for degree-granting institution enrollments were calculated using the last 12 editions of *Projections of Education Statistics*.

NOTE: Mean absolute percentage error is the average value over past projections of the absolute values of errors expressed in percentage terms. No MAPEs are presented for degrees conferred as the current model used for producing their projections has been used for only one other edition of the *Projections of Education Statistics*. Calculations were made using unrounded numbers. Some data have been revised from previously published numbers.

SOURCE: U.S. Department of Education, National Center for Education Statistics, *Projections of Education Statistics*, various issues. (This table was prepared February 2010.)

## A.1. ELEMENTARY AND SECONDARY ENROLLMENT

### Projections in this edition

This edition of *Projections of Education Statistics* presents projected trends in elementary and secondary enrollment from 2008 to 2019. These projections were made using three models:

- » The *National Elementary and Secondary Enrollment Model* was used to project total, public, and private school enrollments for the nation by grade level and for ungraded elementary and ungraded secondary programs.
- » The *State Public Elementary and Secondary Enrollment Model* was used to project total public school enrollments by grade level for individual states and regions.
- » The *National Public Elementary and Secondary Enrollment by Race/Ethnicity Model* was used to project public school enrollments for the nation by race/ethnicity and grade level. This is the first edition of *Projections of Education Statistics* to feature projections by race/ethnicity at the elementary/secondary level.

All three elementary and secondary enrollment models used the following same methods.

### Overview of approach

Two methods were used in all the elementary and secondary enrollment models:

- » The *grade progression rate method* was used to project enrollments in grades 2 through 12. In this method, a rate of progression from each grade (1 through 11) to the next grade (2 through 12) was projected using single exponential smoothing. (For example, the rate of progression from grade 2 to grade 3 is the current year's grade 3 enrollment expressed as a percentage of the previous year's grade 2 enrollment.) To calculate enrollment for each year in the forecast period, the progression rate for each grade was applied to the previous year's enrollment in the previous grade.
- » The *enrollment rate method* was used to project prekindergarten, kindergarten, and first-grade enrollments as well as elementary special and ungraded and secondary special and ungraded enrollments. For each of these enrollment categories, the enrollment rate for the last year of actual data was used as the projected enrollment rate. To calculate enrollment for each year in the forecast period, the enrollment rate for each category was applied to the projected population in the appropriate age group.

### Assumptions underlying these methods

The grade progression and enrollment rate methods assume that past trends in factors affecting public and private elementary and secondary school enrollments will continue over the forecast period. This assumption implies that all factors influencing enrollments will display future patterns consistent with past patterns. This method implicitly includes the net effect of such factors as migration, dropouts, deaths, nonpromotion, and transfers between public and private schools.

*For more details on the use of the grade progression and enrollment rate methods, see "Procedures and equations used in all three elementary and secondary enrollment models," below.*

### Procedures and equations used in all three elementary and secondary enrollment models

The notation and equations that follow describe the basic procedures used to project elementary and secondary enrollments in each of the three elementary and secondary enrollment models.<sup>1</sup>

Let:

- $i$  = Subscript denoting age
- $j$  = Subscript denoting grade
- $t$  = Subscript denoting time

---

<sup>1</sup> In the *Projections of Education Statistics to 2015* and the two subsequent editions of the *Projections of Education Statistics*, there was an inconsistency between the methodological description and the actual methodology used to produce the projections of enrollment at the nursery and kindergarten levels. Historically, the nursery enrollment counts had been underreported by states. Due to this problem, a single parameter was used for the enrollment rate at the nursery and kindergarten levels. Some years ago there was an improvement in the source data. Hence, beginning with the *Projections of Education Statistics to 2015*, there was a change in the methodology from a single parameter to two parameters (nursery and kindergarten separate); however, the methodology section had not reflected this change. No changes have been detected in the projections due to this change in methodology. Beginning with the *Projections of Education Statistics to 2018*, the methodology section reflected the change in the methodology.

- $T$  = Subscript of the first year in the forecast period  
 $N_t$  = Enrollment at the prekindergarten (nursery) level  
 $K_t$  = Enrollment at the kindergarten level  
 $G_{j,t}$  = Enrollment in grade  $j$   
 $E_t$  = Enrollment in elementary special and ungraded programs  
 $S_t$  = Enrollment in secondary special and ungraded programs  
 $P_{i,t}$  = Population age  $i$   
 $R_{j,t}$  = Progression rate for grade  $j$   
 $RN_t$  = Enrollment rate for prekindergarten (nursery school)  
 $RK_t$  = Enrollment rate for kindergarten  
 $RG_{1,t}$  = Enrollment rate for grade 1  
 $RE_t$  = Enrollment rate for elementary special and ungraded programs  
 $RS_t$  = Enrollment rate for secondary special and ungraded programs.

**Step 1.** Calculate historical grade progression rates for each of grades 2 through 12. The first step in projecting the enrollments for grades 2 through 12 using the grade progression method was to calculate, for each grade, a progression rate for each year in the sample period except for the first year. The progression rate for grade  $j$  in year  $t$  equals

$$R_{j,t} = G_{j,t}/G_{j-1,t-1}$$

**Step 2.** Produce a projected progression rate for each of grades 2 through 12. Projections for each grade's progression rate were then produced for the forecast period using single exponential smoothing. As was done in previous editions of the *Projections of Education Statistics*, a smoothing constant of 0.4 was used for each grade. Single exponential smoothing produces a single forecast for all years in the forecast period. Therefore, for each grade  $j$ , the projected progression rate,  $\hat{R}_j$ , is the same for each year in the forecast period.

**Step 3.** Calculate enrollment projections for each of grades 2 through 12. For the first year in the forecast period,  $T$ , enrollment projections,  $\hat{G}_{j,t}$ , for grades 2 through 12, were produced using the projected progression rates and the enrollments of grades 1 through 11 from the last year of actual data,  $T-1$ . Specifically,

$$\hat{G}_{j,t} = \hat{R}_j \cdot G_{j-1,T-1}$$

This same procedure was then used to produce the projections for the following year,  $T+1$ , except that enrollment projections for year  $T$  were used rather than actual numbers:

$$\hat{G}_{j,T+1} = \hat{R}_j \cdot \hat{G}_{j,T}$$

The enrollment projections for grades 2 through 11 for year  $T$  were those just produced using the grade progression method. The projection for grade 1 for year  $T$  was produced using the enrollment rate method, as outlined in steps 4 and 5 below.

The same procedure was used for the remaining years in the projections period.

**Step 4.** For the last year of actual data, calculate enrollment rates for prekindergarten, kindergarten, grade 1, elementary special and ungraded, and secondary special and ungraded. The first step in projecting prekindergarten, kindergarten, first-grade, elementary special and ungraded, and secondary special and ungraded enrollments using the enrollment rate method was to calculate enrollment rates for each enrollment category for the last year in the sample period,  $T-1$ , where:

$$\begin{aligned}
 RN_{T-1} &= N_{T-1}/P_{5,T-1} \\
 RK_{T-1} &= K_{T-1}/P_{5,T-1} \\
 RG_{1,T-1} &= G_{1,T-1}/P_{6,T-1} \\
 RE_{T-1} &= E_{T-1}/\sum_{i=5}^{13} P_{i,T-1} \\
 RS_{T-1} &= S_{T-1}/\sum_{i=14}^{17} P_{i,T-1}
 \end{aligned}$$

These enrollment rates were then used as the projected enrollment rates for each year in the sample period ( $\widehat{RN}$ ,  $\widehat{RK}$ ,  $\widehat{RG}_1$ ,  $\widehat{RE}$ , and  $\widehat{RS}$ .)

**Step 5.** Using the rates for the last year of actual data as the projected enrollment rates, calculate enrollment projections for prekindergarten through grade 1 and the ungraded categories. For each year in the forecast period, the enrollment rates were then multiplied by the appropriate population projections from the U.S. Census Bureau ( $\hat{P}_{i,t}$ ) to calculate enrollment projections for prekindergarten (nursery school) ( $\hat{N}_t$ ), kindergarten ( $\hat{K}_t$ ), first grade ( $\hat{G}_{1,t}$ ), elementary ungraded ( $\hat{E}_t$ ), and secondary ungraded ( $\hat{S}_t$ )

$$\begin{aligned}\hat{N}_t &= \widehat{RN} \cdot \hat{P}_{5,t} \\ \hat{K}_t &= \widehat{RK} \cdot \hat{P}_{5,t} \\ \hat{G}_{1,t} &= \widehat{RG}_1 \cdot \hat{P}_{5,t} \\ \hat{E}_t &= \widehat{RE} \cdot \left( \sum_{i=5}^{13} \hat{P}_{i,t} \right) \\ \hat{S}_t &= \widehat{RS} \cdot \left( \sum_{i=14}^{17} \hat{P}_{i,t} \right)\end{aligned}$$

**Step 6.** Calculate total elementary and secondary enrollments by summing the projections for each grade and the ungraded categories. To obtain projections of total enrollment, projections of enrollments for the individual grades (prekindergarten through 12), elementary ungraded, and secondary ungraded were summed.

## National Elementary and Secondary Enrollment Model

This model was used to project national total, public, and private school enrollments by grade level and for ungraded elementary and ungraded secondary programs. National enrollment projections for public and private schools were developed separately, then added together to yield total elementary and secondary enrollment projections for the nation. To develop these projections, enrollment data from NCES were used, along with population estimates and projections from the U.S. Census Bureau. Below is information about the specific data used to develop the public school projections and the private school projections, as well as information about the grade progression rates and enrollment rates specific to public schools and private schools.

For details on procedures used to develop the projections, see “Procedures and equations used in all three elementary and secondary enrollment models,” earlier in this section of appendix A.

### Data used to develop national elementary and secondary enrollment projections

**Public school enrollment data.** Public school enrollment data from the NCES Common Core of Data (CCD) for 1972 to 2007 were used to develop the national public school enrollment projections.

**Private school enrollment data.** Private school enrollment data from the NCES Private School Universe Survey (PSS) for 1989–90, 1991–92, 1993–94, 1995–96, 1997–98, 1999–2000, 2001–02, 2003–04, 2005–06, and 2007–08 were used to develop the national private school enrollment projections. Since the PSS is collected in the fall of odd numbered years, data for even numbered years without a PSS collection were estimated using data from the PSS.

**Population estimates and projections used for public school enrollment projections.** Population estimates for 1972 to 2008 and population projections for 2009 to 2019 from the U.S. Census Bureau were also used to develop the public school enrollment projections. The set of population projections used in this year’s *Projections of Education Statistics* are the Census Bureau’s 2008 National Population Projections by age and sex (August 2008).

**Population estimates and projections used for private school enrollment projections.** Population estimates for 1989 to 2008 and population projections for 2009 to 2019 from the U.S. Census Bureau were used to develop the private school enrollment projections.

### Grade progression and enrollment rates for national elementary and secondary enrollment projections

**Public school grade progression and enrollment rates.** Table A-3 on page 90 shows the public school grade progression rates for 2007 and projections for 2008 through 2019. Table A-4 on page 91 shows the public school enrollment rates for 2007 and projections for 2008 through 2019.

### Accuracy of national elementary and secondary enrollment projections

Mean absolute percentage errors (MAPEs) for projections of public school enrollment were calculated using the last 26 editions of *Projections of Education Statistics*, while MAPEs for projections of private school enrollment were calculated using the last 8 editions. Exhibit A-3, below, shows MAPEs for both public and private school enrollment projections.

**Exhibit A-3. Mean absolute percentage errors (MAPEs), by lead time for selected statistics in elementary and secondary schools: 2010**

Statistic	Lead time (years)									
	1	2	3	4	5	6	7	8	9	10
<b>Public elementary and secondary schools</b>										
Prekindergarten–12 enrollment	0.3	0.6	0.8	1.1	1.3	1.5	1.8	1.9	2.1	2.3
Prekindergarten–8 enrollment	0.4	0.7	0.9	1.2	1.4	1.7	2.0	2.4	2.8	3.1
9–12 enrollment	0.4	0.7	0.9	1.1	1.3	1.6	2.0	2.3	2.3	2.2
<b>Private elementary and secondary schools</b>										
Prekindergarten–12 enrollment	3.4	4.6	3.7	6.1	5.5	6.0	0.5	1.0	—	—
Prekindergarten–8 enrollment	3.5	4.9	4.1	6.6	6.0	6.7	0.9	1.1	—	—
9–12 enrollment	3.0	3.8	2.3	4.5	3.6	3.5	0.7	0.7	—	—

— Not available.

NOTE: Mean absolute percentage error is the average value over past projections of the absolute values of errors expressed in percentage terms. MAPEs for public prekindergarten (PK)–12 enrollments were calculated using the last 26 editions of *Projections of Education Statistics*. MAPEs for private PK–12 enrollments high school graduates were calculated from the past eight editions. Calculations were made using unrounded numbers. Some data have been revised from previously published numbers.

SOURCE: U.S. Department of Education, National Center for Education Statistics, *Projections of Education Statistics*, various issues. (This table was prepared February 2010.)

For more information about MAPEs, see Section A.0. Introduction, earlier in appendix A.

### State Public Elementary and Secondary Enrollment Model

This edition of *Projections of Education Statistics* contains projected trends in public elementary and secondary enrollment by grade level from 2008 to 2019 for each of the 50 states and the District of Columbia, as well as for each region of the country. The state enrollment projections were produced in two stages:

- » first, an initial set of projections for each state was produced; and
- » second, these initial projections were adjusted to sum to the national public enrollment totals produced by the National Elementary and Secondary Enrollment Model.

For each region, the enrollment projections equaled the sum of enrollment projections for the states within that region.

#### Initial set of state projections

The same methods used to produce the national enrollment projections—namely, the grade progression rate method and the enrollment rate method—were used to produce the initial sets of public school enrollment projections for each state and the District of Columbia. For each jurisdiction, grade progression rates were projected using the same single exponential smoothing parameter of 0.4.

For details on the procedures used to develop the initial sets of projections, see “Procedures and equations used in all three elementary and secondary enrollment models,” earlier in this section of appendix A.

#### Limitations of the grade progression method for state projections

The grade progression rate method assumes that past trends in factors affecting public school enrollments will continue over the forecast period. This assumption implies that all factors influencing enrollments will display future patterns consistent with past patterns. Therefore, this method has limitations when applied to states with unanticipated changes in migration rates. This method implicitly includes the net effect of such factors as migration, dropouts, deaths, nonpromotion, and transfers to and from private schools.

As the source of the enrollment data for private schools, the NCES Private School Universe Survey, does not collect data by state, there are no projections for private school enrollment by state.

#### Adjustments to the state projections

The initial projections of state public school enrollments were adjusted to sum to the national projections of public school prekindergarten (PK)–12, PK–8, and 9–12 enrollments shown in table 1 on page 31. This was done through the use of ratio adjustments in which all the states’ initial enrollment projections for each grade level were multiplied by the ratio of the national enrollment projection for that grade level to the sum of the state enrollment projections for that grade level.

## Data used to develop state elementary and secondary enrollment projections

**Public school enrollment data.** Public school enrollment data from the NCES Common Core of Data (CCD) for 1980 to 2007 were used to develop these projections.

**Population estimates and projections.** Population estimates for 1980 to 2008 and population projections for 2009 to 2019 from the U.S. Census Bureau were used to develop the state-level enrollment projections. The set of population projections used in this year's *Projections of Education Statistics* are the Census Bureau's set of interim state-level population projections by age and sex (April 2005). In order for the state-level population projections to be consistent with the most recent historical estimates released by the Census Bureau, these projections were ratio-adjusted to line up with the most recent historical estimate for each state.

## Accuracy of state elementary and secondary enrollment projections

Mean absolute percentage errors (MAPEs) for projections of public school enrollment by state were calculated using the last 14 editions of *Projections of Education Statistics*. Tables A-5 through A-7 on pages 92–97 show MAPEs for PK–12, PK–8, and 9–12 enrollment in public elementary and secondary schools by state.

## National Public Elementary and Secondary Enrollment by Race/Ethnicity Model

This edition of *Projections of Education Statistics* is the first to contain projected trends in national public elementary and secondary enrollment by race/ethnicity. The enrollment projections by race/ethnicity were produced in two stages:

- » first, an initial set of projections by race/ethnicity was produced; and
- » second, these initial projections were adjusted to sum to the national totals.

## Initial set of projections by race/ethnicity

The same methods used to produce the national enrollment projections—namely, the grade progression rate method and the enrollment rate method—were used to produce initial sets of projections for each of the following five racial/ethnic groups: White, Black, Hispanic, Asian/Pacific Islander, and American Indian/Alaska Native. For each racial/ethnic group, grade progression rates were projected using the same single exponential smoothing parameter of 0.4.

*For details on the procedures used to develop the initial sets of projections, see “Procedures and equations used in all three elementary and secondary enrollment models,” earlier in this section of appendix A.*

## Adjustments to the projections by race/ethnicity

The initial projections of enrollments by race/ethnicity were adjusted to sum to the national projections of public school PK–12, PK–8, and 9–12 enrollments shown in table 1 on page 31. This was done through the use of ratio adjustments in which all the initial enrollment projections by race/ethnicity for each grade level were multiplied by the ratio of the national enrollment projection for that grade level to the sum of the initial enrollment projections by race/ethnicity for that grade level.

## Data and imputations used to develop enrollment projections by race/ethnicity

**Public school enrollment data.** Public school enrollment data by grade level and race/ethnicity from the NCES Common Core of Data (CCD) for 1994 to 2007 were used to develop these projections. While projections by race/ethnicity were produced at the national level only, the national data used to develop these projections were constructed from state-level data on enrollment by grade level and race/ethnicity. In those instances where states did not report their enrollment data by grade level and race/ethnicity, the state-level data had to be examined and some imputations made in order to produce the national public school enrollment by grade level and race/ethnicity data. For example, in 1994, North Dakota did not release grade-level enrollment data by race/ethnicity. It did, however, release these numbers for 1995. So, to impute these numbers for 1994, North Dakota's 1994 grade-level enrollment data were multiplied by the state's 1995 racial/ethnic breakdowns at each grade level.

**Population estimates and projections.** Population estimates for 2000 to 2008 and population projections for 2009 to 2019 from the U.S. Census Bureau were used to develop the enrollment projections by race/ethnicity. The set of population projections used in this year's *Projections of Education Statistics* are the Census Bureau's 2008 National Population Projections by age, sex, and race/ethnicity (August 2008).

## Accuracy of enrollment projections by race/ethnicity

Because this is the first edition of *Projections of Education Statistics* to include projections of elementary and secondary public school enrollments by race/ethnicity, the difference between the projections and actual data for the same years cannot yet be determined.

**Table A-3. Actual and projected national public school grade progression rates: Fall 2007, and 2008 through 2019**

Grade	Actual 2007	Projected 2008 through 2019
1 to 2	98.7	98.6
2 to 3	100.5	100.6
3 to 4	99.9	100.0
4 to 5	100.4	100.5
5 to 6	100.7	100.9
6 to 7	101.1	101.2
7 to 8	99.8	99.7
8 to 9	111.5	112.0
9 to 10	90.7	90.3
10 to 11	91.6	91.7
11 to 12	95.0	94.7

NOTE: The progression rate for a particular grade in a year equals the enrollment in the grade for that year divided by the enrollment in the previous grade in the previous year, all multiplied by 100. For example, the progression rate for 3rd-graders in 2007 equals the enrollment of 3rd-graders in 2007 divided by the enrollment of 2nd-graders in 2006, all multiplied by 100.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Common Core of Data (CCD), "State Nonfiscal Survey of Public Elementary/Secondary Education," 2007-08; and National Elementary and Secondary Enrollment Model, 1972-2007. (This table was prepared January 2010.)



**Table A-4. Actual and projected national enrollment rates in public schools, by grade level: Fall 2007, and 2008 through 2019**

Grade level	Actual 2007	Projected 2008 through 2019
Prekindergarten	26.8	26.8
Kindergarten	89.5	89.5
Grade 1	91.7	91.7
Elementary ungraded	0.4	0.4
Secondary ungraded	0.4	0.4

NOTE: The enrollment rate for each grade level equals the enrollment at that grade level divided by the population of that grade's base age, all multiplied by 100. The base age for each grade level is as follows: kindergarten, 5 years old; grade 1, 6 years old; elementary ungraded, 5 to 13 years old; and secondary ungraded, 14 to 17 years old. Projected values for 2008 through 2019 were held constant at the actual values for 2007. SOURCE: U.S. Department of Education, National Center for Education Statistics, Common Core of Data (CCD), "State Nonfiscal Survey of Public Elementary/Secondary Education," 2007-08; and National Elementary and Secondary Enrollment Model, 1972-2007. (This table was prepared January 2010.)

**Table A-5. Mean absolute percentage errors (MAPEs), by lead time for prekindergarten–12 enrollment in public elementary and secondary schools, by region and state: 2010**

State	Lead time (years)									
	1	2	3	4	5	6	7	8	9	10
<b>United States</b>	<b>0.3</b>	<b>0.6</b>	<b>0.8</b>	<b>1.1</b>	<b>1.3</b>	<b>1.5</b>	<b>1.8</b>	<b>1.9</b>	<b>2.1</b>	<b>2.3</b>
Northeast	0.3	0.3	0.5	0.6	0.5	0.8	0.7	0.7	0.7	0.7
Connecticut	0.6	0.8	1.1	1.6	2.4	3.3	4.5	5.6	6.4	7.4
Maine	0.9	1.3	1.3	1.5	2.0	1.6	1.6	1.6	1.9	2.3
Massachusetts	0.3	0.3	0.3	0.4	0.5	0.7	1.0	1.0	1.4	2.2
New Hampshire	0.6	0.7	0.9	1.2	1.5	2.0	2.6	2.9	3.1	3.3
New Jersey	0.6	1.0	1.6	2.1	2.7	3.3	4.2	5.0	5.5	5.6
New York	0.4	0.6	1.0	1.4	2.0	2.4	2.7	3.2	3.8	4.5
Pennsylvania	1.0	1.1	1.3	1.3	1.5	1.7	1.8	1.9	1.7	2.3
Rhode Island	1.0	1.7	2.5	2.9	2.9	2.4	1.5	1.2	1.6	2.7
Vermont	1.0	1.5	1.8	2.4	3.0	3.6	4.5	5.6	6.3	7.4
Midwest	0.3	0.4	0.6	0.8	1.0	1.1	1.5	1.7	1.5	1.5
Illinois	0.6	0.8	1.0	1.2	1.4	1.7	2.1	2.6	2.9	3.6
Indiana	0.3	0.7	1.1	1.6	2.1	2.6	2.8	2.6	2.2	2.1
Iowa	0.6	0.7	0.9	1.1	1.4	1.0	0.9	1.1	1.7	2.1
Kansas	0.8	1.0	1.3	1.5	1.5	1.5	1.6	1.6	1.6	2.0
Michigan	0.7	1.8	2.5	3.0	3.3	3.6	3.4	4.0	4.5	4.4
Minnesota	0.4	0.5	0.6	0.7	0.9	0.9	1.2	1.4	1.5	1.9
Missouri	0.4	0.5	0.6	0.8	1.0	1.1	1.0	0.8	0.7	1.2
Nebraska	0.5	0.7	0.8	1.1	1.4	1.6	1.7	1.7	1.6	1.4
North Dakota	0.7	1.2	1.6	2.3	3.1	4.6	6.2	7.9	9.5	11.4
Ohio	0.3	0.5	0.7	0.9	1.3	1.5	1.9	2.2	2.4	2.2
South Dakota	0.9	2.0	3.2	4.4	5.8	7.4	8.6	10.2	12.0	15.2
Wisconsin	0.7	0.9	1.2	1.2	1.3	1.3	1.7	1.9	1.6	1.9

See notes at end of table.

**Table A-5. Mean absolute percentage errors (MAPEs), by lead time for prekindergarten–12 enrollment in public elementary and secondary schools, by region and state: 2010—Continued**

State	Lead time (years)									
	1	2	3	4	5	6	7	8	9	10
<b>United States</b>	<b>0.3</b>	<b>0.6</b>	<b>0.8</b>	<b>1.1</b>	<b>1.3</b>	<b>1.5</b>	<b>1.8</b>	<b>1.9</b>	<b>2.1</b>	<b>2.3</b>
South	0.5	0.9	1.4	1.8	2.3	2.6	2.7	2.8	2.7	2.3
Alabama	0.6	0.7	1.2	1.7	2.5	3.1	4.0	5.4	7.0	8.9
Arkansas	0.6	1.2	2.0	2.8	3.6	4.2	4.4	3.9	3.2	2.6
Delaware	0.7	1.2	1.8	2.6	3.8	4.5	5.5	6.1	6.6	7.0
District of Columbia	5.1	4.8	6.1	7.2	7.1	8.0	8.3	5.2	6.5	3.4
Florida	0.9	1.6	1.9	2.4	3.3	4.5	5.9	7.1	8.1	9.1
Georgia	0.8	1.2	1.7	2.4	2.9	3.4	3.8	4.0	4.4	5.0
Kentucky	1.6	1.5	2.2	2.4	2.6	3.0	2.7	2.9	2.8	3.0
Louisiana	2.3	3.4	3.4	4.0	4.8	6.1	7.4	7.4	9.5	12.1
Maryland	0.4	0.7	1.0	1.2	1.5	2.0	2.2	2.5	2.7	3.4
Mississippi	0.5	1.0	1.4	1.5	2.0	2.3	2.8	3.5	4.2	4.9
North Carolina	0.8	1.3	2.2	3.0	3.8	4.2	4.1	3.7	3.4	3.1
Oklahoma	1.0	1.5	2.2	3.0	3.6	4.1	4.4	4.5	4.5	4.1
South Carolina	0.9	1.3	1.7	2.5	3.2	3.8	4.7	5.2	4.6	3.4
Tennessee	1.0	1.3	1.7	2.4	2.9	3.1	3.5	3.7	3.3	2.8
Texas	0.9	1.6	2.2	2.9	3.5	4.2	4.8	5.2	5.5	5.6
Virginia	0.4	0.6	0.9	1.4	2.0	2.4	2.8	3.4	3.4	3.0
West Virginia	0.5	0.7	1.0	1.6	2.2	2.7	3.5	4.2	4.7	5.2
West	0.5	1.0	1.2	1.4	1.7	1.9	2.0	1.9	1.7	1.4
Alaska	1.1	1.9	2.5	3.1	3.8	5.1	6.2	7.4	8.3	8.8
Arizona	2.7	3.6	4.2	5.1	6.3	6.7	7.1	8.1	10.1	12.2
California	0.6	1.0	1.5	2.0	2.5	2.6	2.3	2.0	2.1	2.6
Colorado	0.6	1.0	1.4	1.8	2.4	3.1	4.0	4.3	4.8	5.4
Hawaii	1.9	3.1	4.4	5.9	8.0	10.7	12.9	15.0	17.4	20.2
Idaho	0.7	1.4	2.1	3.0	3.7	4.3	4.7	5.5	6.1	6.7
Montana	1.0	1.6	2.7	3.9	5.5	7.5	9.3	10.9	12.3	13.8
Nevada	1.0	1.5	2.2	3.7	5.4	7.7	10.1	12.3	14.9	18.8
New Mexico	1.6	2.6	3.9	5.3	6.8	8.6	10.9	13.1	15.1	16.7
Oregon	0.5	1.0	1.4	1.6	1.6	2.2	2.9	3.3	3.6	3.9
Utah	1.2	1.5	1.6	2.8	3.6	4.3	4.8	5.2	5.5	4.4
Washington	0.5	0.8	1.2	1.4	1.6	1.9	2.4	2.9	3.5	4.7
Wyoming	1.0	1.6	2.6	4.0	5.8	7.6	9.8	12.2	15.4	18.9

NOTE: Mean absolute percentage error is the average value over past projections of the absolute values of errors expressed in percentage terms. National MAPEs for public prekindergarten–12 enrollments were calculated using the last 26 editions of *Projections of Education Statistics* and state MAPEs were calculated using the last 14 editions of *Projections of Education Statistics*. Calculations were made using unrounded numbers. Some data have been revised from previously published numbers.

SOURCE: U.S. Department of Education, National Center for Education Statistics, *Projections of Education Statistics*, various issues. (This table was prepared June 2010.)

**Table A-6. Mean absolute percentage errors (MAPEs), by lead time for prekindergarten–8 enrollment in public elementary and secondary schools, by region and state: 2010**

State	Lead time (years)									
	1	2	3	4	5	6	7	8	9	10
<b>United States</b>	<b>0.4</b>	<b>0.7</b>	<b>0.9</b>	<b>1.2</b>	<b>1.4</b>	<b>1.7</b>	<b>2.0</b>	<b>2.4</b>	<b>2.8</b>	<b>3.1</b>
Northeast	0.3	0.4	0.6	0.5	0.5	0.7	0.5	0.6	0.7	0.7
Connecticut	0.7	1.0	1.4	1.9	2.8	3.8	4.8	5.4	5.8	6.1
Maine	0.6	1.0	1.2	1.6	2.1	2.7	3.0	3.4	3.7	4.1
Massachusetts	0.2	0.4	0.8	0.8	1.0	1.3	1.6	1.5	1.8	2.3
New Hampshire	0.7	0.9	1.4	1.8	2.6	3.5	3.7	3.7	3.2	2.9
New Jersey	0.7	1.1	1.5	1.9	2.4	2.9	3.4	3.6	4.0	3.9
New York	0.5	0.7	1.0	1.3	1.8	2.1	2.4	2.9	3.5	4.2
Pennsylvania	0.6	0.9	1.1	1.1	1.1	1.1	1.2	1.2	1.3	1.7
Rhode Island	1.3	1.8	2.6	3.1	3.0	3.0	2.5	2.0	2.3	3.1
Vermont	1.3	1.7	1.9	2.8	4.0	5.4	6.9	8.4	9.2	10.2
Midwest	0.2	0.3	0.6	0.7	0.8	0.8	1.1	1.3	1.2	1.3
Illinois	0.7	0.9	1.1	1.2	1.5	1.9	2.3	2.6	2.6	2.6
Indiana	0.5	0.8	1.1	1.5	1.8	2.2	2.4	1.9	1.7	1.9
Iowa	0.7	0.8	0.9	1.5	1.8	1.4	1.3	1.4	1.8	2.0
Kansas	0.9	1.1	1.1	1.3	1.4	1.5	1.8	2.0	2.4	2.8
Michigan	0.7	1.5	2.2	2.5	2.5	2.7	2.5	3.2	3.2	2.5
Minnesota	0.4	0.5	0.7	0.8	1.0	0.9	1.0	1.0	1.1	1.5
Missouri	0.6	0.9	1.1	1.5	1.6	1.6	1.5	1.1	0.9	1.3
Nebraska	0.7	0.9	0.9	1.2	1.5	1.6	1.8	2.1	2.2	2.2
North Dakota	1.1	1.8	2.5	3.4	4.4	6.4	8.3	9.9	11.0	11.9
Ohio	0.4	0.5	0.6	0.6	0.8	0.8	1.0	1.3	1.4	1.6
South Dakota	0.9	1.9	3.2	4.9	7.0	9.5	11.2	13.1	14.9	17.2
Wisconsin	0.7	0.7	0.9	1.0	1.2	1.1	1.3	1.5	1.2	1.5

See notes at end of table.

**Table A-6. Mean absolute percentage errors (MAPEs), by lead time for prekindergarten–8 enrollment in public elementary and secondary schools, by region and state: 2010—Continued**

State	Lead time (years)									
	1	2	3	4	5	6	7	8	9	10
<b>United States</b>	<b>0.4</b>	<b>0.7</b>	<b>0.9</b>	<b>1.2</b>	<b>1.4</b>	<b>1.7</b>	<b>2.0</b>	<b>2.4</b>	<b>2.8</b>	<b>3.1</b>
South	0.6	1.1	1.6	2.1	2.5	2.8	3.0	2.9	2.8	2.6
Alabama	0.7	1.1	1.7	2.4	3.3	4.0	5.2	7.2	9.0	10.8
Arkansas	0.9	1.5	2.5	3.4	4.3	5.1	5.2	4.5	3.8	3.1
Delaware	0.9	1.6	2.4	3.4	4.5	5.2	6.1	6.8	7.6	8.4
District of Columbia	4.7	4.8	6.1	7.0	6.4	7.4	7.7	4.7	7.5	6.7
Florida	1.1	1.9	2.4	2.9	4.0	5.4	6.7	7.6	8.4	9.1
Georgia	1.0	1.5	2.1	2.7	3.5	3.8	4.1	4.2	4.6	5.3
Kentucky	1.6	1.9	2.8	2.9	3.4	3.1	2.9	3.2	2.7	3.2
Louisiana	2.1	3.2	3.0	3.3	3.9	5.1	6.2	6.0	7.9	10.1
Maryland	0.4	0.7	1.1	1.5	2.0	2.7	3.3	4.1	4.8	6.0
Mississippi	0.7	1.3	1.8	2.0	2.4	2.7	3.3	4.0	4.7	5.1
North Carolina	1.0	1.7	2.6	3.6	4.5	5.1	5.0	5.0	5.0	4.6
Oklahoma	1.4	2.1	3.1	4.1	4.9	5.7	6.2	6.2	6.3	6.3
South Carolina	1.2	1.7	2.3	3.3	4.0	4.4	5.0	5.5	5.2	4.2
Tennessee	0.9	1.2	1.8	2.2	2.6	2.6	2.8	3.0	2.8	2.6
Texas	1.2	1.9	2.6	3.4	4.1	4.6	5.0	5.1	5.4	5.6
Virginia	0.6	1.0	1.1	1.4	2.0	2.3	2.8	3.2	3.3	2.9
West Virginia	0.6	0.7	1.0	1.6	2.2	2.6	3.4	4.2	4.7	4.9
West	0.6	1.1	1.3	1.5	1.8	2.0	2.0	2.1	2.0	1.9
Alaska	1.4	2.2	2.9	3.7	5.2	7.2	8.7	10.2	11.6	12.5
Arizona	2.3	2.7	3.6	4.5	5.9	6.9	7.0	8.1	9.2	10.8
California	0.9	1.5	1.8	2.3	2.9	3.1	2.6	2.2	2.4	3.2
Colorado	0.7	1.3	1.8	2.3	3.0	3.9	4.8	5.3	5.9	6.5
Hawaii	2.0	3.5	4.8	6.6	9.3	12.8	15.5	17.9	20.6	23.4
Idaho	0.9	1.9	3.0	4.0	4.8	5.3	5.9	6.9	7.6	7.5
Montana	1.2	2.2	3.6	5.3	7.6	10.6	13.2	15.4	17.1	18.4
Nevada	1.2	2.4	4.0	5.8	8.4	11.6	14.4	16.6	19.1	22.1
New Mexico	1.4	2.5	3.3	4.4	5.6	7.8	10.2	12.5	13.9	14.6
Oregon	0.5	0.9	1.0	1.2	1.6	2.2	2.8	3.3	3.8	4.7
Utah	1.3	1.6	2.0	3.2	4.1	4.8	5.1	5.3	5.0	3.2
Washington	0.5	0.8	1.2	1.6	1.8	2.3	2.7	3.4	4.1	5.1
Wyoming	1.1	1.8	3.2	5.3	7.8	10.8	13.5	16.4	19.4	22.2

NOTE: Mean absolute percentage error is the average value over past projections of the absolute values of errors expressed in percentage terms. National MAPEs for public prekindergarten–8 enrollments were calculated using the last 26 editions of *Projections of Education Statistics* and state MAPEs were calculated using the last 14 editions of *Projections of Education Statistics*. Calculations were made using unrounded numbers. Some data have been revised from previously published numbers.

SOURCE: U.S. Department of Education, National Center for Education Statistics, *Projections of Education Statistics*, various issues. (This table was prepared June 2010.)

**Table A-7. Mean absolute percentage errors (MAPEs), by lead time for 9–12 enrollment in public elementary and secondary schools, by region and state: 2010**

State	Lead time (years)									
	1	2	3	4	5	6	7	8	9	10
<b>United States</b>	<b>0.4</b>	<b>0.7</b>	<b>0.9</b>	<b>1.1</b>	<b>1.3</b>	<b>1.6</b>	<b>2.0</b>	<b>2.3</b>	<b>2.3</b>	<b>2.2</b>
Northeast	0.6	0.8	0.9	1.1	1.2	1.2	1.3	1.5	1.2	1.2
Connecticut	0.6	0.9	0.8	1.0	1.8	2.7	4.0	6.1	8.0	10.4
Maine	1.8	2.9	3.6	4.1	4.7	5.6	6.6	7.5	7.8	5.9
Massachusetts	0.6	0.9	1.3	1.4	1.8	2.4	2.4	2.3	2.6	2.9
New Hampshire	0.6	1.1	1.5	1.8	2.0	2.1	2.1	3.3	4.3	5.6
New Jersey	0.6	1.4	2.2	2.6	3.5	4.7	6.3	8.2	9.7	10.2
New York	0.7	1.3	1.4	1.8	2.4	3.1	3.5	3.8	4.5	5.1
Pennsylvania	1.9	1.6	1.8	2.3	2.3	3.1	3.1	3.3	2.4	3.8
Rhode Island	0.8	1.4	2.6	3.6	4.4	4.7	4.0	3.8	2.8	3.0
Vermont	0.9	2.5	3.1	3.6	3.9	4.1	4.0	3.5	3.8	4.3
Midwest	0.6	1.0	1.3	1.5	1.7	1.9	2.4	2.6	2.3	2.1
Illinois	0.9	1.3	1.7	2.0	2.3	3.2	3.9	4.9	5.5	6.0
Indiana	0.6	1.0	1.5	2.1	2.8	3.5	4.1	4.4	4.5	4.5
Iowa	0.9	1.0	1.3	1.2	1.4	1.5	1.3	1.3	1.6	2.2
Kansas	1.3	1.9	2.6	2.9	2.8	2.5	2.4	2.2	1.9	0.9
Michigan	1.7	3.0	3.7	4.4	5.5	6.2	7.2	8.1	9.1	9.7
Minnesota	0.6	1.0	1.3	1.5	1.7	2.0	2.2	2.5	2.7	3.4
Missouri	0.4	0.7	0.9	1.3	1.7	1.7	1.8	1.4	1.2	1.2
Nebraska	0.4	0.8	1.2	1.6	2.0	2.5	2.8	2.9	2.6	2.2
North Dakota	0.7	1.1	1.4	2.0	2.6	3.5	4.6	6.1	8.3	10.6
Ohio	0.9	1.4	1.7	2.0	2.6	3.1	3.7	4.4	4.4	3.7
South Dakota	1.4	3.1	4.6	6.0	7.4	8.7	10.0	10.9	11.2	10.9
Wisconsin	0.9	1.5	1.8	1.9	2.2	2.3	2.5	2.7	2.4	2.7

See notes at end of table.

**Table A-7. Mean absolute percentage errors (MAPEs), by lead time for 9–12 enrollment in public elementary and secondary schools, by region and state: 2010—Continued**

State	Lead time (years)									
	1	2	3	4	5	6	7	8	9	10
<b>United States</b>	<b>0.4</b>	<b>0.7</b>	<b>0.9</b>	<b>1.1</b>	<b>1.3</b>	<b>1.6</b>	<b>2.0</b>	<b>2.3</b>	<b>2.3</b>	<b>2.2</b>
South	0.4	0.8	1.2	1.5	1.8	2.2	2.5	2.7	2.4	1.9
Alabama	0.9	1.1	1.5	1.9	2.1	3.1	3.4	3.6	4.0	4.7
Arkansas	0.5	0.9	1.4	1.6	1.9	2.1	2.3	2.4	1.9	1.8
Delaware	1.2	1.2	1.5	2.2	2.9	3.7	4.5	4.5	5.0	6.6
District of Columbia	6.8	7.2	10.2	13.1	16.2	19.2	18.5	17.3	18.1	13.3
Florida	0.6	1.1	1.4	1.6	2.0	2.9	4.1	5.8	7.4	9.2
Georgia	0.5	1.0	1.5	1.8	2.0	2.4	3.0	3.5	4.1	4.4
Kentucky	1.8	2.3	2.4	2.4	2.0	3.6	3.1	3.2	3.3	2.6
Louisiana	3.5	4.5	4.7	5.9	7.3	8.8	10.5	11.1	14.1	17.7
Maryland	0.6	0.7	1.1	1.2	1.2	1.6	2.0	2.3	2.5	2.6
Mississippi	0.6	1.3	1.9	2.1	2.5	2.7	3.0	3.3	3.9	4.5
North Carolina	1.0	1.5	1.9	1.9	2.2	2.3	2.3	1.8	1.6	2.1
Oklahoma	0.4	0.9	1.2	1.7	2.1	2.4	2.6	2.4	2.1	2.1
South Carolina	0.8	1.1	1.3	1.5	2.0	2.9	3.7	4.4	3.6	3.8
Tennessee	2.1	2.2	3.0	4.0	5.0	5.3	5.6	5.6	4.7	3.9
Texas	0.6	1.2	1.8	2.3	2.8	3.6	4.4	5.3	5.6	5.5
Virginia	0.5	0.9	1.4	2.2	3.1	3.9	4.5	5.0	4.8	3.5
West Virginia	0.8	1.1	1.3	1.6	2.2	3.1	3.8	4.4	4.8	5.9
West	0.6	0.9	1.3	1.7	1.9	2.2	2.6	2.8	2.5	1.1
Alaska	1.1	2.2	2.8	2.7	2.8	2.8	3.7	3.9	4.7	4.7
Arizona	4.6	7.2	8.4	8.1	7.4	6.9	7.4	8.0	11.9	16.7
California	0.5	1.1	1.6	2.2	2.5	2.5	2.6	2.9	2.5	1.9
Colorado	0.6	1.1	1.6	1.8	2.0	2.5	2.8	3.2	3.3	3.4
Hawaii	2.0	3.0	4.0	5.0	5.8	7.2	8.4	9.3	9.8	12.4
Idaho	0.7	1.2	1.8	2.4	3.2	3.6	4.2	4.6	4.4	4.8
Montana	0.6	1.1	1.7	2.5	3.3	4.0	4.3	4.3	4.2	4.3
Nevada	1.2	2.2	2.6	3.0	3.0	3.2	3.4	5.3	8.8	12.4
New Mexico	3.2	5.1	6.8	8.5	10.8	12.2	14.0	15.3	17.8	21.6
Oregon	1.3	2.0	2.6	2.9	2.7	3.3	4.1	5.0	4.8	4.3
Utah	1.1	1.3	0.7	1.8	2.4	3.1	4.0	5.1	6.6	7.8
Washington	0.7	0.9	1.2	1.5	1.9	2.4	3.1	3.6	4.3	4.8
Wyoming	0.8	1.4	2.3	3.1	4.1	5.0	6.3	7.3	8.7	11.9

NOTE: Mean absolute percentage error is the average value over past projections of the absolute values of errors expressed in percentage terms. National MAPEs for public 9–12 enrollments were calculated using the last 26 editions of *Projections of Education Statistics* and state MAPEs were calculated using the last 14 editions of *Projections of Education Statistics*. Calculations were made using unrounded numbers. Some data have been revised from previously published numbers.

SOURCE: U.S. Department of Education, National Center for Education Statistics, *Projections of Education Statistics*, various issues. (This table was prepared June 2010.)

## A.2. HIGH SCHOOL GRADUATES

### Projections in this edition

This edition of *Projections of Education Statistics* presents projected trends in the number of high school graduates from 2007–08 to 2019–20. These projections were made using three models:

- » The *National High School Graduates Model* was used to project the number of public high school graduates, the number of private high school graduates, and the total number of high school graduates for the nation.
- » The *State Public High School Graduates Model* was used to project the number of high school graduates for individual states and regions.
- » The *National Public High School Graduates by Race/Ethnicity Model* was used to project the number of public high school graduates for the nation by race/ethnicity. This is the first edition of *Projections of Education Statistics* to feature projections by race/ethnicity of high school graduates.

### Overview of approach

All the high school graduates models first calculated the number of high school graduates as a percentage of grade 12 enrollment based on historical data. Single exponential smoothing was used to project this percentage. The projected percentage was then applied to projections of grade 12 enrollment.

### Assumptions underlying this approach

The percentage of 12th-graders who graduate was assumed to remain constant at levels consistent with the most recent rates. This methodology assumes that past trends in factors affecting graduation ratios, such as dropouts, migration, and public or private transfers, will continue over the forecast period. (No specific assumptions were made regarding the dropout rate; the effect of the 12th-grade dropout proportion is reflected implicitly in the graduate proportion.) In addition to student behaviors, the projected number of graduates could be affected by changes in graduation requirements, but this is not considered in the projections in this report.

*For more details on the steps used for projections of high school graduates, see “Procedures used in all three high school graduates models,” below.*

### Procedures used in all three high school graduates models

The following steps were used to project the numbers of high school graduates:

**Step 1.** *For each year in the historic period, express the number of high school graduates as a percentage of grade 12 enrollment.* This value represents the approximate percentage of 12th-graders who graduate. For information about the specific historical data and analysis periods used for the National High School Graduates Model, the State Public High School Graduates Model, and the National Public High School Graduates by Race/Ethnicity Model, see the description of the appropriate model, later in this section of appendix A.

**Step 2.** *Project the percentage of 12th-graders who graduate from step 1.* As was done in previous editions of the *Projections of Education Statistics*, this percentage was projected using single exponential smoothing with a smoothing constant,  $\alpha$ , equal to 0.4. Because single exponential smoothing produces a single forecast for all years in the forecast period, the same projected percentage of grade 12 enrollment was used for each year in the forecast period.

**Step 3.** *Calculate projections of the numbers of high school graduates.* For each year in the forecast period, the projected percentage from step 2 was applied to projections of grade 12 enrollment to yield projections of high school graduates.

### National High School Graduates Model

This model was used to project the number of public high school graduates, the number of private high school graduates, and the total number of high school graduates for the nation. Public and private high school graduates were projected separately. The public and private projections were then summed to yield projections of the total number of high school graduates for the nation.

*For details of the procedures used to develop the projections, see “Procedures used in all three high school graduates models,” above.*



## Data used in the National High School Graduates Model

**Public school data on graduates and grade 12 enrollment.** Data on public school 12th-grade enrollments and high school graduates from the NCES Common Core of Data (CCD) for 1972–73 to 2006–07 were used to develop national projections of public high school graduates.

**Private school data on graduates and grade 12 enrollment.** Data on private school 12th-grade enrollments for 1989–90 through 2007–08 and high school graduates for 1988–89 through 2006–07 were used to develop national projections of private high school graduates. The data were from the biennial NCES Private School Universe Survey (PSS) from 1989–90 to 2007–08 with data for 12th grade enrollment the same as the year of the survey and the data for high school graduates for the preceding year (i.e. the 2007–08 PSS presents high school graduates for 2006–07). Since the PSS is collected in the fall of odd numbered years, data for missing years were estimated using data from the PSS. For 12th grade enrollment, estimates for missing years were linear interpolations of the prior year’s and succeeding year’s actual values. For high school graduates, estimates for the missing years were the interpolations of the high school graduates to estimated 12th grade enrollment percentages for the prior and succeeding year multiplied by the estimated enrollments for the current year.

**Public and private school enrollment projections for grade 12.** Projections of grade 12 enrollment in public schools and in private schools were used to develop projections of public high school graduates and private high school graduates, respectively. The grade 12 enrollment projections were made using the grade progression method. For more information, see Section A.1. Elementary and Secondary Enrollment, earlier in this appendix.

## Accuracy of national high school graduates projections

Mean absolute percentage errors (MAPEs) for projections of graduates from public high schools were calculated using the last 19 editions of *Projections of Education Statistics*, while MAPEs for projections of graduates from private high schools were calculated using the last 8 editions. Exhibit A-4, below, shows MAPEs for both public and private school enrollment projections.

**Exhibit A-4. Mean absolute percentage errors (MAPEs), by lead time for high school graduates: 2010**

Statistic	Lead time (years)									
	1	2	3	4	5	6	7	8	9	10
Public high school graduates	1.0	1.0	1.6	1.7	1.7	2.2	2.9	3.7	4.0	3.8
Private high school graduates	0.9	0.9	2.0	2.8	5.9	5.6	2.2	2.2	—	—

— Not available.

NOTE: MAPEs for public high school graduates were calculated from the past 19 editions of *Projections of Education Statistics*. MAPEs for private PK-12 enrollments high school graduates were calculated from the past eight editions. Calculations were made using unrounded numbers. Some data have been revised from previously published numbers.

SOURCE: U.S. Department of Education, National Center for Education Statistics, *Projections of Education Statistics*, various issues. (This table was prepared February 2010.)

For more information about MAPEs, see Section A.0. Introduction, earlier in appendix A.

## State Public High School Graduates Model

This edition of *Projections of Education Statistics* contains projections of public high school graduates from 2007–08 to 2019–20 for each of the 50 states and the District of Columbia, as well as for each region of the country. The state projections of high school graduates were produced in two stages:

- » first, an initial set of projections for each state was produced; and
- » second, these initial projections were adjusted to sum to the national public school totals produced by the National High School Graduates Model.

For each region, the high school graduate projections equaled the sum of high school graduate projections for the states within that region.

## Initial set of state projections

The same steps used to produce the national projections of high school graduates were used to produce an initial set of projections for each state and the District of Columbia. Each jurisdiction was projected using the same single exponential smoothing parameter of 0.4.

For details on the steps used to develop the initial sets of projections, see “Procedures used in all three high school graduate models,” earlier in this section of appendix A.

### *Adjustments to the state projections*

The initial projections of state public high school graduates were adjusted to sum to the national projections of public high school graduates shown in table 12 on page 47. This was done through the use of ratio adjustments in which all the states' high school graduate projections were multiplied by the ratio of the national public high school graduate projection to the sum of the state public high school projections.

### *Data used in the State Public High School Graduates Model*

**Public school data on graduates and grade 12 enrollment at the state level.** State-level data on public school 12th-grade enrollments and high school graduates from the NCES Common Core of Data (CCD) for 1980–81 to 2006–07 were used to develop these projections.

**Public school projections for grade 12 enrollment at the state level.** State-level projections of grade 12 enrollment in public schools were used to develop the state-level projections of public high school graduates. The grade 12 enrollment projections were made using the grade progression method. For more information, see Section A.1. Elementary and Secondary Enrollment, earlier in this appendix.

### *Accuracy of state public high school graduate projections*

Mean absolute percentage errors (MAPEs) for projections of the number of public high school graduates by state were calculated using the last 14 editions of *Projections of Education Statistics*. Table A-8 on pages 102–103 show MAPEs for the number of high school graduates by state.

### **National Public High School Graduates by Race/Ethnicity Model**

This edition of *Projections of Education Statistics* is the first to contain projections of high school graduates from public schools by race/ethnicity. The projections of public high school graduates by race/ethnicity were produced in two stages:

- » first, an initial set of projections for each racial/ethnic group was produced; and
- » second, these initial projections were adjusted to sum to the national public school totals produced by the National High School Graduates Model.

### *Initial set of projections by race/ethnicity*

The same steps used to produce the national projections of high school graduates were used to produce an initial set of projections for each of the following five racial/ethnic groups: White, Black, Hispanic, Asian/Pacific Islander, and American Indian/Alaska Native. For example, the number of White public high school graduates was projected as a percentage of White grade 12 enrollment in public schools. Each racial/ethnic group was projected using the same single exponential smoothing parameter of 0.4.

### *Adjustments to the projections by race/ethnicity*

The projections of public high school graduates by race/ethnicity were adjusted to sum to the national projections of public high school graduates shown in table 12 on page 47. This was done through the use of ratio adjustments in which all high school graduate projections by race/ethnicity were multiplied by the ratio of the national high school graduate projection to the sum of the high school projections by race/ethnicity.

### *Data and imputations used in the Public High School Graduates by Race/Ethnicity Model*

**Public school data on graduates and grade 12 enrollment by race/ethnicity.** Data on public high school graduates and grade 12 enrollment by race/ethnicity from the NCES Common Core of Data (CCD) for 1994–95 to 2006–07 were used to develop these projections. In those instances where states did not report their high school graduate data by race/ethnicity, the state-level data had to be examined and some imputations made. For example, in 1994, Arizona did not release high school graduate data by race/ethnicity. It did, however, release grade 12 enrollment numbers by race/ethnicity for that year. So, to impute the high school graduate numbers by race/ethnicity for that year, Arizona's total number of high school graduates for 1994 was multiplied by the state's 1994 racial/ethnic breakdowns for grade 12 enrollment.

**Public enrollment projections for grade 12 by race/ethnicity.** Projections of grade 12 enrollment in public schools by race/ethnicity were used to develop the projections of public high school graduates by race/ethnicity. The grade 12 enrollment projections were made using the grade progression method. For more information, see Section A.1. Elementary and Secondary Enrollment, earlier in this appendix.

#### *Accuracy of enrollment projections by race/ethnicity*

Because this is the first edition of *Projections of Education Statistics* to include projections of public high school graduates by race/ethnicity, the difference between the projections and actual data for the same years cannot yet be determined.

**Table A-8. Mean absolute percentage errors (MAPEs), by lead time for the number of high school graduates in public elementary and secondary schools, by region and state: 2010**

State	Lead time (years)									
	1	2	3	4	5	6	7	8	9	10
<b>United States</b>	<b>1.0</b>	<b>1.0</b>	<b>1.6</b>	<b>1.7</b>	<b>1.7</b>	<b>2.2</b>	<b>2.9</b>	<b>3.7</b>	<b>4.0</b>	<b>3.8</b>
Northeast	1.3	1.5	1.4	1.4	1.6	2.2	2.2	2.7	3.3	2.6
Connecticut	1.7	1.4	1.2	1.9	2.7	2.6	3.5	3.2	3.8	3.6
Maine	2.9	4.3	3.6	3.9	4.7	4.9	6.0	6.5	8.3	8.2
Massachusetts	0.8	1.3	2.1	2.0	1.9	1.8	1.7	1.2	1.1	1.5
New Hampshire	1.1	1.9	1.9	2.2	2.3	3.1	3.0	3.9	4.0	3.0
New Jersey	2.7	4.7	5.7	5.2	5.2	6.2	7.8	9.9	10.8	11.5
New York	1.9	3.0	2.1	2.6	3.0	3.9	4.3	5.2	5.6	5.2
Pennsylvania	1.6	1.2	1.4	1.8	1.8	2.3	2.7	3.4	3.5	2.4
Rhode Island	1.5	1.2	2.2	2.1	2.4	3.3	4.9	5.4	5.2	4.6
Vermont	2.0	2.1	3.4	4.3	6.5	6.3	6.6	6.9	8.2	7.7
Midwest	1.1	0.7	1.7	1.5	2.1	2.6	2.5	2.5	2.3	1.3
Illinois	2.7	2.2	3.5	4.2	4.4	3.9	6.5	4.8	6.6	9.1
Indiana	1.8	2.1	1.8	1.8	1.8	2.6	3.6	4.0	4.5	4.5
Iowa	1.6	1.2	1.9	1.7	2.8	2.9	3.2	2.9	3.0	2.8
Kansas	1.4	1.3	2.0	1.8	2.9	4.1	4.5	4.8	5.3	4.6
Michigan	3.6	4.5	5.6	6.6	7.0	6.9	7.7	8.2	8.1	7.8
Minnesota	2.6	1.6	1.6	1.9	2.2	2.2	3.0	4.1	4.9	5.5
Missouri	1.0	1.5	2.5	2.9	3.0	3.9	4.0	4.1	4.5	3.5
Nebraska	1.5	2.1	2.2	1.6	2.1	2.5	2.6	2.8	2.2	1.8
North Dakota	1.2	1.5	1.9	2.0	2.0	2.7	3.8	3.8	4.6	7.1
Ohio	1.7	1.5	3.1	3.3	3.8	3.9	3.1	3.3	3.1	3.9
South Dakota	2.5	3.1	3.5	6.2	10.3	12.0	13.6	15.0	17.3	17.8
Wisconsin	1.4	1.7	2.9	2.5	2.9	3.7	3.9	4.3	4.4	2.9

See notes at end of table.

**Table A-8. Mean absolute percentage errors (MAPEs), by lead time for the number of high school graduates in public elementary and secondary schools, by region and state: 2010—Continued**

State	Lead time (years)									
	1	2	3	4	5	6	7	8	9	10
<b>United States</b>	<b>1.0</b>	<b>1.0</b>	<b>1.6</b>	<b>1.7</b>	<b>1.7</b>	<b>2.2</b>	<b>2.9</b>	<b>3.7</b>	<b>4.0</b>	<b>3.8</b>
South	1.2	1.4	2.5	2.1	2.3	3.0	3.2	4.1	4.3	4.4
Alabama	3.8	2.8	1.7	4.0	3.9	4.9	5.3	4.6	4.6	4.3
Arkansas	1.6	1.7	2.2	2.5	3.0	2.8	2.9	3.0	1.9	2.3
Delaware	2.5	3.2	4.2	5.5	3.7	4.2	4.3	4.9	4.4	4.9
District of Columbia	6.5	7.4	11.3	13.7	16.5	17.2	16.2	16.2	14.0	11.2
Florida	2.0	4.4	5.8	3.0	4.2	4.9	6.1	7.5	7.6	5.6
Georgia	2.0	2.3	3.2	4.7	6.4	7.2	7.6	7.2	6.8	5.4
Kentucky	2.2	3.9	3.9	4.6	5.2	5.5	5.5	5.5	4.2	3.3
Louisiana	1.4	2.6	3.6	5.5	5.1	4.0	4.0	3.8	5.0	7.9
Maryland	1.5	1.1	1.9	1.5	1.4	1.9	2.5	2.9	2.8	4.3
Mississippi	1.0	1.5	2.3	2.6	3.4	4.3	3.9	4.2	4.0	2.8
North Carolina	1.6	1.8	3.5	3.8	4.3	4.1	3.5	4.0	3.9	6.8
Oklahoma	1.6	1.6	2.1	1.8	2.2	3.0	3.2	2.7	2.0	1.9
South Carolina	1.4	3.5	2.6	3.6	4.6	5.8	6.1	6.1	4.6	3.7
Tennessee	5.5	7.0	8.8	11.0	13.0	13.9	13.3	11.5	9.3	7.8
Texas	2.7	3.8	5.2	6.3	6.8	8.4	9.7	11.8	12.9	14.7
Virginia	1.7	2.3	2.8	3.5	4.2	4.6	4.6	4.0	5.3	5.4
West Virginia	0.8	1.2	2.1	2.3	2.4	3.4	3.6	5.1	5.6	6.2
West	1.8	2.2	2.5	2.8	2.3	2.2	2.3	2.7	3.8	2.9
Alaska	2.5	2.4	2.6	3.7	3.9	5.0	6.3	6.3	6.4	5.9
Arizona	9.8	9.4	10.8	12.5	10.4	12.5	14.5	9.6	8.2	9.2
California	2.3	2.3	2.8	3.6	3.6	3.8	4.4	4.1	5.8	6.1
Colorado	1.7	2.0	2.4	1.5	2.3	2.4	2.6	3.8	4.5	3.5
Hawaii	4.1	4.4	5.5	6.7	10.4	11.4	14.5	16.1	18.4	20.8
Idaho	1.0	1.4	1.2	1.5	2.0	3.2	3.7	4.6	5.9	5.5
Montana	0.8	0.9	1.6	1.4	2.6	4.1	5.3	7.6	9.7	11.8
Nevada	4.5	6.6	10.0	11.8	9.5	9.9	8.3	9.1	9.9	10.3
New Mexico	3.5	2.8	4.7	4.5	6.2	6.9	7.7	9.5	12.0	12.8
Oregon	2.0	2.3	2.8	4.2	5.2	5.6	5.7	6.5	6.6	4.5
Utah	4.1	5.0	4.3	4.1	3.7	3.6	3.9	4.2	4.1	2.0
Washington	2.1	2.3	2.9	1.9	2.4	3.2	4.0	3.7	4.9	4.6
Wyoming	1.7	2.2	2.3	3.0	4.3	5.7	7.7	9.0	10.7	12.4

NOTE: Mean absolute percentage error is the average value over past projections of the absolute values of errors expressed in percentage terms. National MAPEs for public high school graduates were calculated using the last 19 editions of *Projections of Education Statistics* and state MAPEs were calculated using the last 14 editions of *Projections of Education Statistics*. Calculations were made using unrounded numbers. Some data have been revised from previously published numbers.

SOURCE: U.S. Department of Education, National Center for Education Statistics, *Projections of Education Statistics*, various issues. (This table was prepared June 2010.)

## A.3. ELEMENTARY AND SECONDARY TEACHERS

### Projections in this edition

This edition of *Projections of Education Statistics* presents projected trends in elementary and secondary teachers, pupil/teacher ratios, and new teacher hires from 2008 to 2019. These projections were made using two models:

- » The *Elementary and Secondary Teacher Model* was used to project the number of public school teachers, the number of private school teachers, and the total number of teachers for the nation. It was also used to project pupil/teacher ratios for public schools, private schools, and all elementary and secondary schools.
- » The *New Teacher Hires Model* was used to project the number of new teacher hires in public schools, private schools, and all schools.

### Overview of approach

#### *Approach for numbers of teachers and pupil/teacher ratios*

**Public schools.** Multiple linear regression was used to produce initial projections of public school pupil/teacher ratios separately for elementary and secondary schools. The initial projections of elementary pupil/teacher ratios and secondary pupil/teacher ratios were applied to enrollment projections to project the numbers of elementary teachers and secondary teachers, which were summed to get the total number of public school teachers. Final projections of the overall public school pupil/teacher ratios were produced by dividing total projected public school enrollment by the total projected number of teachers.

#### *Assumptions underlying this method*

This method assumes that past relationships between the public school pupil/teacher ratio (the dependent variable) and the independent variables used in the regression analysis will continue throughout the forecast period. For more information about the independent variables, see “Elementary and Secondary Teacher Model,” later in this section of appendix A.

**Private schools.** Private school pupil/teacher ratios were projected by applying each year’s projected annual percentage change in the overall public school pupil/teacher ratio to the previous year’s private school pupil/teacher ratio. The projected private school pupil/teacher ratios were then applied to projected enrollments at private schools to produce projected numbers of private school teachers.

#### *Assumptions underlying this method*

This method assumes that the future pattern in the trend of private school pupil/teacher ratios will be the same as that for public school pupil/teacher ratios. The reader is cautioned that a number of factors could alter the assumption of constant ratios over the forecast period.

#### *Approach for new teacher hires*

The following numbers were projected separately for public schools and for private schools:

- » *The number of teachers needed to replace teachers who leave teaching from one year to the next.* This number was estimated based on continuation rates of teachers by their age.
- » *The number of teachers needed to fill openings due to an increase in the size of the teaching workforce from one year to the next.* This number was estimated by subtracting the projected number of teachers in one year from the projected number of teachers in the next year.

These two numbers were summed to yield the total number of “new teacher hires” for each sector—that is, teachers who will be hired in a given year, but who did not teach in that sector the previous year. A teacher who moves from one sector to the other sector (e.g. from a public to private school or from a private to a public school) is considered a new teacher hire, but a teacher who moves from one school to another school in the same sector is not considered a new teacher hire.

### Elementary and Secondary Teacher Model

Projections for public schools were produced first. Projections for private schools were produced based partially on input from the public school projections. Finally, the public and private school projections were combined into total elementary and secondary school projections (not shown in the steps below).

## Steps used to project numbers of teachers and pupil/teacher ratios

**Public school teachers.** The following steps were used for the public school projections:

**Step 1.** Produce projections of pupil/teacher ratios for public elementary schools and public secondary schools separately. Two separate equations were used—one for elementary schools and one for secondary schools. The equations for elementary and secondary schools included an AR(1) term for correcting for autocorrelation and the following independent variables:

- » *Independent variables for public elementary school pupil/teacher ratios*—(1) average teacher wage relative to the overall economy-level wage, and (2) level of education revenue from state sources in constant dollars per public elementary student.
- » *Independent variables for public secondary school pupil/teacher ratios*—(1) level of education revenue from state sources in constant dollars per public secondary student, and (2) the number of students enrolled in public secondary schools relative to the secondary school–age population.

To estimate the models, they were first transformed into nonlinear models and then the coefficients were estimated simultaneously by applying a Marquardt nonlinear least squares algorithm to the transformed equation.

*For details on the equations, model statistics, and data used to project public school pupil/teacher ratios, see “Data and equations used for projections of teachers and pupil/teacher ratios,” below.*

**Step 2.** Produce projections of the number of teachers for public elementary schools and public secondary schools separately. The projections of the public elementary pupil/teacher ratio and public secondary pupil/teacher ratio were applied to projections of enrollments in elementary schools and secondary schools, respectively, to produce projections of public elementary teachers and public secondary teachers.

**Step 3.** Produce projections of the total number of teachers for public elementary and secondary schools combined. The projections of public elementary teachers and public secondary teachers were added together to produce the projections of the total number of public elementary and secondary teachers.

**Step 4.** Produce projections of the pupil/teacher ratio for public elementary and secondary schools combined. The projections of the total number of public elementary and secondary teachers were divided by projections of total enrollment in public elementary and secondary schools to produce projections of the overall pupil/teacher ratio in public elementary and secondary schools.

**Private school teachers.** The following steps were used for the private school projections:

**Step 1.** Produce projections of the private school pupil/teacher ratio. First, the projection of the private school pupil/teacher ratio for 2008 was calculated by multiplying the private school pupil/teacher ratio for 2007 (the last year of actual data) by the percentage change from 2007 to 2008 in the public school pupil/teacher ratio. The same method was used to calculate the projections of the private school pupil/teacher ratio for 2009 through 2019. That is, each year’s projected annual percentage change in the public school pupil/teacher ratio was applied to the previous year’s private school pupil/teacher ratio.

**Step 2.** Produce projections of the number of private school teachers. The projected pupil/teacher ratios were applied to projected private school enrollments to produce projections of private school teachers from 2008 through 2019.

*For information about the private school teacher and enrollment data used for the private school projections, see “Data and equations used for projections of teachers and pupil/teacher ratios,” below.*

## Data and equations used for projections of teachers and pupil/teacher ratios

Public school data used in these projections were by organizational level (i.e., school level), not by grade level. Thus, secondary enrollment is not the same as enrollment in grades 9 through 12 because some jurisdictions count some grade 7 and 8 enrollment as secondary. For example, some jurisdictions may have 6-year high schools with grades 7 through 12.

**Data used to estimate the equation for public elementary school pupil/teacher ratios.** The following data were used to estimate the equation:

- » To compute the historical elementary school pupil/teacher ratios—Data on 1973–74 to 2007–08 enrollments in public elementary schools came from the NCES Common Core of Data (CCD). The proportion of public school teachers who taught in elementary schools was taken from the National Education Association and then applied to the total number of public school teachers from the CCD to produce the number of teachers in elementary schools.
- » Data on 1973–74 to 2007–08 education revenue from state sources came from the CCD.

**Estimated equation and model statistics for public elementary school pupil/teacher ratios.** For the estimated equation and model statistics, see table A-9 on page 110. In each equation, the independent variables affect the dependent variable in the expected way. In the public elementary student/teacher ratio equation:

- » As the average teacher wage relative to the overall economy-level wage increases, the student/teacher ratio increases; and
- » As the level of education revenue from state sources in constant dollars per public elementary student increases, the class size decreases.

In the public secondary student/teacher ratio equation:

- » As enrollment rates (number of enrolled students relative to the school-age population) increase, the student/teacher ratio increases; and
- » As the level of real grants per secondary student increases, the student/teacher ratio decreases.

**Data used to project public elementary school pupil/teacher ratios.** The estimated equation was run using projected values for teacher salaries and local governments education revenues from state sources from 2008–09 through 2018–19. For more information, see Section A.0. Introduction, earlier in this appendix and Section A.4 Expenditures for Public Elementary and Secondary Education later in this appendix.

**Data used to estimate the equation for public secondary school pupil/teacher ratios.** The following data were used to estimate the equation:

- » To compute the historical secondary school pupil/teacher ratios—Data on 1973–74 to 2007–08 enrollments in public secondary schools came from the NCES Common Core of Data (CCD). The proportion of public school teachers who taught in secondary schools was taken from the National Education Association and then applied to the total number of public school teachers from the CCD to produce the number of teachers in secondary schools.
- » Data on 1973–74 to 2007–08 education revenue from state sources came from the CCD.
- » To compute the historical secondary school enrollment rate—Data on the secondary school-age population from 1973–74 to 2007–08 came from the U.S. Census Bureau. Data on enrollments in public secondary schools during the same period came from the CCD, as noted above.

**Estimated equation and model statistics for public secondary school pupil/teacher ratios.** For the estimated equation and model statistics, see table A-9 on page 110.

**Data used to project public secondary school pupil/teacher ratios.** The estimated equation was run using projections for education revenues, public secondary enrollments, and secondary school-age populations from 2008–09 through 2018–19. Secondary enrollment projections were derived from the enrollment projections described in Section A.1. Elementary and Secondary Enrollment. Population projections were from the Census Bureau’s 2008 National Population Projections middle series by age and sex (August 2008).

**Private school teacher and enrollment data.** Private school data for 1989–90, 1991–92, 1993–94, 1995–96, 1997–98, 1999–2000, 2001–02, 2003–04, 2005–06, and 2007–08 came from the biennial NCES Private School Universe Survey (PSS). Since the PSS is collected in the fall of odd numbered years, data for years without a PSS collection were estimated using data from the PSS.

**Private school enrollment projections.** Private school enrollments from 2008 to 2019 came from the projections described in Section A.1. Elementary and Secondary Enrollment, earlier in this appendix.

### *Accuracy of projections of numbers of teachers*

Mean absolute percentage errors (MAPEs) for projections of public school teachers were calculated using the last 19 editions of *Projections of Education Statistics*. Exhibit A-5, below, shows MAPEs for projections of the numbers of public school teachers. There was a change in the methodology for projecting private school teachers beginning with the *Projections of Education Statistics to 2017*, and therefore there are too few years of data to present the MAPEs for private school teachers.



**Exhibit A-5. Mean absolute percentage errors (MAPEs), by lead time for public elementary and secondary school teachers: 2010**

Statistic	Lead time (years)									
	1	2	3	4	5	6	7	8	9	10
Public elementary and secondary teachers	1.0	1.4	1.7	2.4	3.0	3.6	3.9	4.4	5.1	6.3

NOTE: Data for teachers expressed in full-time equivalents. MAPEs for teachers were calculated from the past 19 editions containing teacher projections. Calculations were made using unrounded numbers. Some data have been revised from previously published numbers.

SOURCE: U.S. Department of Education, National Center for Education Statistics, *Projections of Education Statistics*, various issues. (This table was prepared February 2010.)

*For more information about MAPEs, see Section A.0. Introduction, earlier in this appendix.*

## New Teacher Hires Model

The New Teacher Hires Model was estimated separately for public and private school teachers. The model produces projections of the number of teachers who were not teaching in the previous year, but who will be hired in a given year.

### About new teacher hires

A teacher is considered to be a new teacher hire for a sector (public or private) for a given year if the teacher teaches in that sector that year but had not taught in that sector in the previous year. Included among new teachers hires are: (1) teachers who are new to the profession; (2) teachers who had taught previously but had not been teaching the previous year; and (3) teachers who had been teaching in one sector the previous year but have moved to the other sector. Concerning the last category, if a teacher moves from one public school to a different public school, that teacher would not be counted as a new teacher hire for the purposes of this model. On the other hand, if a teacher moves from a public school to a private school, that teacher would be counted as a private school new teacher hire, since the teacher did not teach in a private school in the previous year.

The New Teacher Hires Model measures the demand for teacher hires. Due to difficulties in defining and measuring the pool of potential teachers, no attempt was made to measure the supply of new teacher candidates.

### Steps used to project numbers of new teacher hires

The steps outlined below provide a general summary of how the New Teacher Hires Model was used to produce projections of the need for new teacher hires.

*For more information about the New Teacher Hires Model, see Hussar (1999).*

First, the whole series of steps outlined below was used to produce projections of public school new teacher hires. Then, the same steps were used to produce projections of private school new hires. Finally, the public and private new teacher hires were combined to produce projections of total new teacher hires.

**Step 1.** *Estimate the age distribution of full-time-equivalent (FTE) teachers in 2007.* For this estimate, the age distribution of the headcount of school teachers (including both full-time and part-time teachers) in 2007 was applied to the national number of FTE teachers in the same year.

**Step 2.** *Estimate the number of new FTE teacher hires needed to replace those who left teaching between 2007 and 2008.* In this step

- » Age-specific continuation rates for 2004 were applied to the FTE count of teachers by age for 2007, resulting in estimates of the number of FTE teachers who remained in teaching in 2008 by individual age.
- » The FTE teachers who remained in teaching by individual age were summed across all ages to produce an estimate of the total number of FTE teachers who remained teaching in 2008.
- » The total number of remaining FTE teachers in 2008 was subtracted from the total FTE teacher count for 2007 to produce the estimated number of FTE teachers who left teaching.

**Step 3.** *Estimate the number of new FTE teacher hires needed due to the overall increase in the teacher workforce between 2007 and 2008.* The total number of FTE teachers in 2007 was subtracted from the total number of FTE teachers in 2008 to determine the overall increase in the teaching workforce between 2007 and 2008.

**Step 4.** Estimate the total number of new FTE teacher hires needed in 2008. The number of FTE teachers who left teaching from step 2 was added to the estimated net change in the number of FTE teachers from step 3 to estimate the total number of new FTE teacher hires needed in 2008.

**Step 5.** Estimate the FTE count of teachers by age for 2008. In this step

- » The age distribution for the headcount of newly hired teachers in 2007 was applied to the estimated total number of new FTE teacher hires in 2008, resulting in the estimated number of new FTE teacher hires by age.
- » For each individual age, the estimated number of new FTE teacher hires was added to the estimated number of remaining FTE teachers (from step 2, first bullet) to produce the estimated FTE count of teachers by age for 2008.

**Step 6.** Repeat steps 2 to 5 for each year from 2009 through 2019.

- » In step 2
  - For public school teachers ages 28 through 66 and private school teachers ages 23 through 65, projections of age-specific continuation rates were used. As was done in previous editions of the *Projections of Education Statistics*, these projections were produced using single exponential smoothing with a smoothing constant,  $\alpha$ , equal to 0.4. (For a general description of the exponential smoothing technique, see Section A.0. Introduction, earlier in this appendix.)
  - For all other ages, the age-specific continuation rates for 2004 (the last year of actual data) were used.
- » In step 3, projections of the numbers of FTE teachers were used for all years in which there were no actual teacher numbers. The projections of FTE teachers are described under “Elementary and Secondary Teacher Model,” earlier in this section of appendix A.

### *Assumptions underlying this method*

A number of assumptions are made in order to make these projections. They include that (1) the age distribution of FTE teachers in 2007 was similar to that of full-time and part-time teachers in that year (step 1); (2) the age-specific continuation rates for FTE teachers for each year from 2004 through 2019 are similar to either the projections produced using single exponential smoothing or the values for 2004, depending on the age of the teachers (step 2); (3) the age distribution for newly hired FTE teachers from 2008 through 2019 is similar to that of newly hired full-time and part-time teachers in 2007 (step 3); (4) the actual numbers of FTE teachers for each year from 2008 through 2019 are similar to projections of FTE teachers shown in table 16 on page 53; and (5) no economic or political changes further affect the size of the teaching force.

### *Data used for projections of new teacher hires*

**Data on numbers of public school teachers.** Numbers of FTE teachers for 2003 through 2007 came from the NCES Common Core of Data (CCD).

**Data on numbers of private school teachers.** Private school data on the numbers of FTE teachers in 2003–04, 2005–06, and 2007–08 came from the biennial NCES Private School Universe Survey (PSS). Since the PSS is collected in the fall of odd numbered years, data for years without a PSS collection were estimated using data from the PSS.

**Data on the age distribution of public and private school teachers.** Data on the age distribution of full-time and part-time public and private school teachers came from the 2007–08 NCES Schools and Staffing Survey (SASS). These data and their standard errors are shown in table A-10 on page 111.

**Data on the age distribution of public and private new teacher hires.** Data on the age distribution of newly hired full-time and part-time public and private school teachers came from the 2007–08 NCES Schools and Staffing Survey (SASS). These data and their standard errors are shown in table A-11 on page 111.

**Data on and projections of age-specific continuation rates of public and private school teachers.** The 2004 continuation rates came from the 2004–05 NCES Teacher Follow-Up Survey (TFS). Data from the 1994–95 and 2000–01 TFS were also used in the projection of age-specific continuation rates. The actual data, their standard errors, and the projections are shown in table A-12 on page 112.

**Projections of the numbers of public and private elementary and secondary school teachers.** These projections are described under “Elementary and Secondary Teacher Model,” earlier in this section of appendix A.

### *Accuracy of projections of new teacher hires*

Because this is the third edition of *Projections of Education Statistics* to include projections of new teacher hires, there are too few years of data to present the MAPEs for new teacher hires.

**Table A-9. Estimated equations and model statistics for public elementary and secondary teachers**

Dependent variable	Equation <sup>1</sup>	R <sup>2</sup>	Breusch-Godfrey Serial Correlation LM test statistic <sup>2</sup>	Time period
Elementary	$\ln(\text{RELENRTCH}) = 3.93 + .06 \ln(\text{RSALARY}) - .25 \ln(\text{RSGRNTELENR}) + .51\text{AR}(1)$ (35.037) (3.532) (-9.112) (2.887)	0.99	.03 (0.983)	1973 to 2006
Secondary	$\ln(\text{RSCENRTCH}) = 4.16 - .23 \ln(\text{RSGRNTSCENR}) + .63 \ln(\text{RSCENRPU}) + .52\text{AR}(1)$ (44.931) (-16.147) (5.631) (3.095)	0.99	.06 (0.969)	1973 to 2006

<sup>1</sup> AR(1) indicates that the model included an AR(1) term for correcting for first-order autocorrelation. To estimate the model, it was first transformed into a nonlinear model and then the coefficients were estimated simultaneously by applying a Marquardt nonlinear least squares algorithm to the transformed equation. For a general discussion of the problem of autocorrelation, and the method used to forecast in the presence of autocorrelation, see Judge, G., Hill, W., Griffiths, R., Lutkepohl, H., and Lee, T. *The Theory and Practice of Econometrics*, New York: John Wiley and Sons, 1985, pp. 315–318.

<sup>2</sup> Number in parentheses is Prob. Chi-Square(2) associated with the Breusch-Godfrey Serial Correlation LM Test. A p value greater than 0.05 implies that we do not reject the null hypothesis of no autocorrelation at the 5 or 10 percent significance levels. For an explanation of the Breusch-Godfrey Serial Correlation LM test statistic, see Greene, W. (2000). *Econometric Analysis*. New Jersey: Prentice-Hall.

NOTE: R<sup>2</sup> indicates the coefficient of determination. Numbers in parentheses are t-statistics.

RELENRTCH = Ln of the ratio of public elementary school enrollment to classroom teachers (i.e., student/teacher ratio).

RSCENRTCH = Ln of the ratio of public secondary school enrollment to classroom teachers (i.e., student/teacher ratio).

RSALARY = Ln of the average annual teacher salary relative to the overall economy wage in 2000 dollars.

RSGRNTELENR = Ln of the ratio of education revenue receipts from state sources per capita to public elementary school enrollment in 2000 dollars.

RSGRNTSCENR = Ln of the ratio of education revenue receipts from state sources per capita to public secondary school enrollment in 2000 dollars.

RSCENRPU = Ln of the ratio of enrollment in public secondary schools to the 11- to 18-year-old population.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Elementary and Secondary Teacher Model, 1973–2006. (This table was prepared February 2010.)

**Table A-10. Percentage distribution of full-time and part-time school teachers, by age, control of school, and teaching status: 2007–08**

Control of school and teaching status	Percent of total	Age distribution								
		Total	Less than 25 years	25–29 years	30–39 years	40–49 years	50–59 years	60–64 years	65 years or more	
<b>Public-actual</b>										
<b>2007–08</b>	<b>100.0</b> (†)	<b>100.0</b>	<b>3.7</b> (0.21)	<b>14.3</b> (0.51)	<b>26.4</b> (0.39)	<b>23.7</b> (0.47)	<b>25.8</b> (0.51)	<b>4.8</b> (0.24)	<b>1.3</b> (0.12)	
Full-time	91.8 (0.29)	100.0	3.8 (0.22)	14.6 (0.50)	26.5 (0.40)	23.6 (0.50)	25.7 (0.54)	4.7 (0.25)	1.2 (0.13)	
Part-time	8.2 (0.29)	100.0	2.5 (0.46)	11.8 (1.18)	25.3 (1.56)	24.7 (1.48)	27.6 (1.33)	6.0 (0.83)	2.1 (0.34)	
<b>Private-actual</b>										
<b>2007–08</b>	<b>100.0</b> (†)	<b>100.0</b>	<b>4.6</b> (0.34)	<b>11.7</b> (0.48)	<b>22.3</b> (0.91)	<b>23.8</b> (0.65)	<b>26.2</b> (0.87)	<b>7.9</b> (0.52)	<b>3.6</b> (0.41)	
Full-time	78.8 (0.93)	100.0	5.0 (0.37)	13.0 (0.66)	23.0 (0.96)	23.0 (0.65)	25.0 (0.98)	8.0 (0.56)	3.0 (0.38)	
Part-time	21.2 (0.93)	100.0	3.0 (0.80)	7.0 (0.90)	19.0 (1.86)	27.0 (1.90)	29.0 (1.46)	9.0 (1.57)	7.0 (1.09)	

† Not applicable.

NOTE: Detail may not sum to totals because of rounding. Standard errors appear in parentheses.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Schools and Staffing Survey (SASS), “Public School Teacher Questionnaire,” 2007–08 and “Private School Teacher Questionnaire,” 2007–08; and unpublished tabulations. (This table was prepared October 2010.)

**Table A-11. Percentage distribution of full-time and part-time newly hired teachers, by age and control of school: Selected years, 1987–88 through 2007–08**

Control of school and school year	Age distribution								
	Total	Less than 25 years	25–29 years	30–39 years	40–49 years	50–59 years	60–64 years	65 years or more	
<b>Public</b>									
1987–88	100.0	17.7 (0.79)	23.7 (1.19)	33.0 (1.43)	21.2 (0.80)	4.0 (0.51)	0.3! (0.11)	‡ (†)	
1990–91	100.0	17.5 (1.06)	24.0 (1.35)	30.6 (1.33)	21.4 (1.28)	5.6 (0.65)	0.6 (0.18)	‡ (†)	
1993–94	100.0	16.2 (0.91)	28.7 (1.15)	24.9 (1.04)	24.6 (1.16)	5.0 (0.63)	0.5 (0.13)	0.2! (0.09)	
1999–2000	100.0	23.6 (1.28)	22.5 (0.97)	22.2 (1.10)	19.2 (0.90)	11.1 (0.88)	0.9 (0.23)	0.6! (0.26)	
2003–04	100.0	24.4 (1.21)	19.0 (1.23)	24.6 (1.10)	16.5 (1.18)	13.3 (0.93)	1.5 (0.29)	0.7! (0.29)	
2007–08	100.0	23.8 (1.75)	24.3 (1.79)	20.4 (1.56)	15.1 (0.94)	13.6 (1.22)	2.3 (0.39)	0.5! (0.22)	
<b>Private</b>									
1987–88	100.0	17.0 (1.27)	22.8 (1.68)	32.5 (2.17)	17.9 (1.61)	5.3 (1.09)	‡ (†)	1.8! (0.77)	
1990–91	100.0	15.8 (1.47)	26.3 (1.83)	29.1 (1.86)	21.1 (1.67)	5.6 (0.88)	1.1! (0.40)	1.0! (0.42)	
1993–94	100.0	19.3 (1.13)	24.4 (1.19)	24.9 (1.49)	22.6 (1.18)	7.3 (0.85)	0.9 (0.20)	0.6! (0.23)	
1999–2000	100.0	18.5 (0.89)	17.2 (0.87)	24.1 (1.24)	22.1 (1.19)	14.0 (1.01)	2.6 (0.39)	1.5 (0.38)	
2003–04	100.0	17.1 (1.59)	16.0 (2.13)	23.0 (2.19)	22.8 (3.32)	15.3 (1.77)	3.6 (0.83)	2.1 (0.58)	
2007–08	100.0	14.3 (1.26)	18.2 (1.36)	23.2 (1.97)	23.6 (1.92)	14.4 (1.49)	4.2 (0.84)	2.1! (0.69)	

† Not applicable.

# Rounds to zero.

! Interpret data with caution. The coefficient of variation exceeds 30 percent of the estimate.

‡ Reporting standards not met.

NOTE: Detail may not sum to totals because of rounding. Standard errors appear in parentheses.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Schools and Staffing Survey (SASS), “Public School Teacher Questionnaire,” 1987–88 through 2007–08 and “Private School Teacher Questionnaire,” 1987–88 through 2007–08; and unpublished tabulations. (This table was prepared October 2010.)

**Table A-12. Actual and projected continuation rates of full-time and part-time school teachers, by age and control of school: Various years, 1993–94 to 1994–95 through 2018–19 to 2019–20**

Control of school and school year	Continuation rates, by age													
	Total	Less than 25 years		25–29 years		30–39 years		40–49 years		50–59 years		60–64 years		65 years or older
<b>Public-actual</b>														
1993–94 to 1994–95	93.4 (0.36)	96.2 (1.09)	90.0 (1.22)	93.3 (1.03)	96.1 (0.54)	93.7 (0.77)	69.5 (4.79)	65.9 (8.81)						
1999–2000 to 2000–01	92.4 (0.38)	95.8 (1.51)	89.3 (1.31)	93.2 (0.85)	94.5 (0.74)	92.9 (0.73)	76.8 (4.59)	77.6 (5.97)						
2003–04 to 2004–05	91.4 (0.45)	94.9 (1.79)	90.1 (1.71)	92.6 (0.93)	94.5 (0.78)	90.8 (0.81)	77.2 (3.00)	70.3 (9.40)						
<b>Public-projected</b>														
2004–05 to 2005–06	92.3 (†)	95.8 (†)	91.0 (†)	93.2 (†)	95.1 (†)	92.0 (†)	74.6 (†)	67.4 (†)						
2005–06 to 2006–07	92.2 (†)	95.8 (†)	91.0 (†)	93.3 (†)	95.1 (†)	91.8 (†)	74.3 (†)	70.2 (†)						
2006–07 to 2007–08	92.0 (†)	95.8 (†)	91.0 (†)	93.3 (†)	95.0 (†)	91.7 (†)	74.3 (†)	69.0 (†)						
2007–08 to 2008–09	91.9 (†)	95.8 (†)	91.0 (†)	93.3 (†)	95.0 (†)	91.7 (†)	75.0 (†)	66.3 (†)						
2008–09 to 2009–10	91.7 (†)	95.8 (†)	91.0 (†)	93.3 (†)	95.0 (†)	91.6 (†)	74.6 (†)	65.2 (†)						
2009–10 to 2010–11	91.6 (†)	95.8 (†)	91.0 (†)	93.3 (†)	95.0 (†)	91.6 (†)	74.0 (†)	65.2 (†)						
2010–11 to 2011–12	91.6 (†)	95.8 (†)	91.0 (†)	93.3 (†)	95.0 (†)	91.5 (†)	73.8 (†)	65.9 (†)						
2011–12 to 2012–13	91.5 (†)	95.8 (†)	91.0 (†)	93.3 (†)	95.0 (†)	91.5 (†)	73.8 (†)	64.0 (†)						
2012–13 to 2013–14	91.6 (†)	95.8 (†)	91.0 (†)	93.2 (†)	95.0 (†)	91.6 (†)	74.0 (†)	63.5 (†)						
2013–14 to 2014–15	91.6 (†)	95.8 (†)	91.0 (†)	93.2 (†)	95.0 (†)	91.6 (†)	73.6 (†)	64.3 (†)						
2014–15 to 2015–16	91.7 (†)	95.8 (†)	91.0 (†)	93.2 (†)	95.0 (†)	91.6 (†)	73.6 (†)	65.5 (†)						
2015–16 to 2016–17	91.7 (†)	95.8 (†)	91.0 (†)	93.2 (†)	95.0 (†)	91.6 (†)	73.5 (†)	66.4 (†)						
2016–17 to 2017–18	91.8 (†)	95.8 (†)	91.0 (†)	93.2 (†)	95.0 (†)	91.7 (†)	73.8 (†)	66.0 (†)						
2017–18 to 2018–19	91.8 (†)	95.8 (†)	91.0 (†)	93.3 (†)	95.0 (†)	91.8 (†)	73.8 (†)	66.6 (†)						
2018–19 to 2019–20	91.8 (†)	95.8 (†)	91.0 (†)	93.3 (†)	95.0 (†)	91.8 (†)	73.8 (†)	66.6 (†)						
<b>Private-actual</b>														
1993–94 to 1994–95	88.1 (0.74)	80.0 (4.42)	86.9 (1.64)	85.1 (1.70)	91.3 (1.14)	91.8 (1.52)	86.9 (2.74)	58.1 (8.67)						
1999–2000 to 2000–01	83.0 (0.72)	61.7 (4.90)	72.2 (2.76)	80.2 (1.57)	86.1 (1.47)	92.3 (1.00)	78.8 (4.79)	75.2 (5.17)						
2003–04 to 2004–05	83.3 (2.06)	75.4 (5.97)	71.7 (3.62)	82.2 (2.30)	86.8 (2.28)	89.2 (9.17)	80.1 (4.15)	79.5 (6.07)						
<b>Private-projected</b>														
2004–05 to 2005–06	83.2 (†)	72.7 (†)	73.6 (†)	81.3 (†)	86.9 (†)	89.6 (†)	79.6 (†)	75.7 (†)						
2005–06 to 2006–07	83.1 (†)	72.5 (†)	73.5 (†)	81.1 (†)	86.8 (†)	89.5 (†)	79.1 (†)	75.1 (†)						
2006–07 to 2007–08	83.3 (†)	72.5 (†)	73.5 (†)	81.3 (†)	87.0 (†)	89.5 (†)	79.7 (†)	76.0 (†)						
2007–08 to 2008–09	83.3 (†)	72.4 (†)	73.5 (†)	81.4 (†)	86.8 (†)	89.4 (†)	79.7 (†)	75.3 (†)						
2008–09 to 2009–10	83.2 (†)	72.4 (†)	73.5 (†)	81.4 (†)	86.9 (†)	89.5 (†)	79.6 (†)	75.7 (†)						
2009–10 to 2010–11	83.1 (†)	72.4 (†)	73.5 (†)	81.4 (†)	86.8 (†)	89.4 (†)	79.3 (†)	72.8 (†)						
2010–11 to 2011–12	83.1 (†)	72.4 (†)	73.5 (†)	81.3 (†)	86.8 (†)	89.4 (†)	79.0 (†)	74.8 (†)						
2011–12 to 2012–13	83.0 (†)	72.4 (†)	73.5 (†)	81.4 (†)	86.9 (†)	89.4 (†)	79.2 (†)	73.0 (†)						
2012–13 to 2013–14	83.1 (†)	72.4 (†)	73.5 (†)	81.3 (†)	86.9 (†)	89.4 (†)	79.3 (†)	74.1 (†)						
2013–14 to 2014–15	83.0 (†)	72.4 (†)	73.5 (†)	81.3 (†)	86.9 (†)	89.4 (†)	79.1 (†)	72.9 (†)						
2014–15 to 2015–16	83.0 (†)	72.4 (†)	73.5 (†)	81.3 (†)	86.8 (†)	89.4 (†)	79.2 (†)	72.4 (†)						
2015–16 to 2016–17	83.0 (†)	72.4 (†)	73.5 (†)	81.3 (†)	86.9 (†)	89.4 (†)	79.2 (†)	73.2 (†)						
2016–17 to 2017–18	83.0 (†)	72.4 (†)	73.5 (†)	81.3 (†)	86.9 (†)	89.4 (†)	79.2 (†)	73.7 (†)						
2017–18 to 2018–19	83.0 (†)	72.4 (†)	73.5 (†)	81.3 (†)	86.9 (†)	89.4 (†)	79.3 (†)	73.3 (†)						
2018–19 to 2019–20	83.0 (†)	72.4 (†)	73.5 (†)	81.3 (†)	86.9 (†)	89.4 (†)	79.3 (†)	73.3 (†)						

† Not applicable.

NOTE: The continuation rate for teachers for each of the two sectors (public schools and private schools) is the percentage of teachers in that sector who continued teaching in the same sector from the first year to the next. Standard errors appear in parentheses.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Teacher Follow up Survey (TFS), “Public School Teacher Questionnaire,” 1994–95 through 2004–05 and “Private School Teacher Questionnaire,” 1994–95 through 2004–05; and unpublished tabulations. (This table was prepared October 2010.)

## A.4. EXPENDITURES FOR PUBLIC ELEMENTARY AND SECONDARY EDUCATION

### Projections in this edition

This edition of *Projections of Education Statistics* presents projections of total current expenditures for public elementary and secondary education, current expenditures per pupil in fall enrollment, and current expenditures per pupil in average daily attendance for 2007–08 through 2019–20.

As the source of the elementary and secondary private school data, the NCES Private School Universe Survey, does not collect data for current expenditures, there are no projections for private school current expenditures.

### Overview of approach

#### *Theoretical and empirical background*

The Public Elementary and Secondary Education Current Expenditure Model used in this report is based on the theoretical and empirical literature on the demand for local public services such as education.<sup>1</sup> Specifically, it is based on a type of model that has been called a median voter model. In brief, a median voter model posits that spending for each public good in the community (in this case, spending for education) reflects the preferences of the “median voter” in the community. This individual is identified as the voter in the community with the median income and median property value. The amount of spending in the community reflects the price of education facing the voter with the median income, as well as his income and tastes. There are competing models in which the level of spending reflects the choices of others in the community, such as government officials.

In a median voter model, the demand for education expenditures is typically linked to four different types of independent variables: (1) measures of the income of the median voter; (2) measures of intergovernmental aid for education going indirectly to the median voter; (3) measures of the price to the median voter of providing one more dollar of education expenditures per pupil; and (4) any other variables that may affect one’s tastes for education. The Public Elementary and Secondary Education Current Expenditure Model contains independent variables of the first two types. It uses multiple linear regression analysis to define the relationships between these independent variables and current expenditures (the dependent variable).

### Elementary and Secondary Education Current Expenditure Model

Projections for current expenditures per pupil in fall enrollment were produced first. These projections were then used in calculating total expenditures and expenditures per pupil in average daily attendance.

#### *Steps used to project current expenditures for public elementary and secondary education*

**Step 1.** *Produce projections of local governments’ education revenue from state sources.* The equation for local government’s education revenue included an AR(1) term for correcting for autocorrelation and the following independent variables:

- » disposable income per capita in constant dollars; and
- » the ratio of fall enrollment to the population.

To estimate the model, it was first transformed into a nonlinear model and then the coefficients were estimated simultaneously by applying a Marquardt nonlinear least squares algorithm to the transformed equation.

**Step 2.** *Produce projections of current expenditures per pupil in fall enrollment.* The equation for current expenditures per pupil for fall enrollment included an AR(1) term for correcting for autocorrelation and the following independent variables:

- » disposable income per capita in constant dollars; and
- » local governments’ education revenue from state sources per capita in constant dollars. This variable was projected in step 1.

To estimate the models, they were first transformed into nonlinear models and then the coefficients were estimated simultaneously by applying a Marquardt nonlinear least squares algorithm to the transformed equation.

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<sup>1</sup> For a discussion of the theory together with a review of some of the older literature, see Inman (1979). More recent empirical work includes Gamkhar and Oates (1996) and Mitias and Turnbull (2001).

For details on the equations used in steps 1 and 2, the data used to estimate these equations, and their results, see “Data and equations used for projections of current expenditures for public elementary and secondary education,” below.

**Step 3. Produce projections of total current expenditures.** Projections of total current expenditures were made by multiplying the projections for current expenditures per pupil in fall enrollment by projections for fall enrollment.

**Step 4. Produce projections of current expenditures per pupil in average daily attendance.** The projections for total current expenditures were divided by projections for average daily attendance to produce projections of current expenditures per pupil in average daily attendance.

All the projections were developed in 1982–84 dollars and then placed in 2007–08 dollars using the projections of the Consumer Price Index. Current-dollar projections were produced by multiplying the constant-dollar projections by projections for the Consumer Price Index. The Consumer Price Index and the other economic variables used in calculating the projections presented in this report were placed in school year terms rather than calendar year terms.

### **Data and equations used for projections of current expenditures for public elementary and secondary education**

**Data used to estimate the equations for revenue from state sources and current expenditures per pupil.** The following data for the period from 1973–74 to 2006–07 were used to estimate the equations:

- » Current expenditures and revenues from state sources—For 1973–74 and 1975–76, the current expenditures data came from *Statistics of State School Systems*, published by NCES. For 1974–75 and 1976–77, the current expenditures data came from *Revenues and Expenditures for Public Elementary and Secondary Education*, also published by NCES. For 1977–78 through 2006–07, these data came from the NCES Common Core of Data (CCD) and unpublished data. For most years, the sources for the past values of revenue from state sources were identical to the sources for current expenditures.
- » Disposable personal income per capita—Disposable personal income from the Bureau of Economic Analysis were divided by population data from the U.S. Census Bureau.
- » Fall enrollment to population data—Fall enrollment data from the CCD were divided by population data from the U.S. Census Bureau.

**Estimated equations and model statistics for revenue from state sources and current expenditures per pupil.** For the results of the equations, see table A-13 on page 116. In each equation, the independent variables affect the dependent variable in the expected way. In the revenues from state sources equation:

- » All other things being equal, as disposable income per capita increases so does local governments’ education revenue from state sources per capita; and
- » As enrollment increases relative to the population, so does the local governments’ education revenue from state sources per capita.
- » In the current expenditures per pupil equation: All other things being equal, as disposable income per capita increases, so does current expenditures per pupil; and
- » As local governments’ education revenue from state sources per capita increases, so does current expenditures per pupil.

**Projections for economic variables.** Projections for economic variables, including disposable income and the Consumer Price Index, were from the “U.S. Monthly Model: November 2009 Short-Term Projections” from the economic consulting firm, IHS Global Insight (see supplemental table B-6). The values of all the variables from IHS Global Insight were placed in school-year terms. The school-year numbers were calculated by taking the average of the last two quarters of one year and the first two quarters of the next year.

**Projections for fall enrollment.** The projections for fall enrollment are those presented in section 1 of this publication. The methodology for these projections is presented in Section A.1. Elementary and Secondary Enrollment, earlier in this appendix.

**Projections for population.** Population estimates for 1973 to 2008 and population projections for 2009 to 2019 from the U.S. Census Bureau were used to develop the public school current expenditure projections. The set of population projections used in this year’s *Projections of Education Statistics* are the Census Bureau’s 2008 National Population Projections (August 2008).

**Historical data for average daily attendance.** For 1973–74 and 1975–76, these data came from *Statistics of State School Systems*, published by NCES. For 1974–75 and 1976–77, the current expenditures data came from *Revenues and Expenditures for Public Elementary and Secondary Education*, also published by NCES. For 1977–78 through 2006–07, these data came from the CCD and unpublished NCES data.



**Projections for average daily attendance.** These projections were made by multiplying the projections for enrollment by the average value of the ratios of average daily attendance to enrollment from 1993–94 to 2006–07; this average value was approximately 0.93.

### Accuracy of projections

Mean absolute percentage errors (MAPEs) for projections of current expenditures for public elementary and secondary education were calculated using the last 19 editions of *Projections of Education Statistics*. Exhibit A-6, below, shows the MAPEs for projections of current expenditures.

**Exhibit A-6. Mean absolute percentage errors (MAPEs), by lead time for current expenditures for public elementary and secondary education: 2010**

Statistic	Lead time (years)									
	1	2	3	4	5	6	7	8	9	10
Total current expenditures	1.2	2.1	2.2	2.3	2.7	3.5	4.2	4.3	4.1	4.4
Current expenditures per pupil in fall enrollment	1.2	2.0	2.0	2.3	3.1	3.7	4.7	4.9	5.6	5.8

NOTE: In constant dollars based on the Consumer Price Index for all urban consumers, Bureau of Labor Statistics, U.S. Department of Labor. MAPEs for current expenditures were calculated using projections from the last 19 editions of *Projections of Education Statistics* containing current expenditure projections. Calculations were made using unrounded numbers. Some data have been revised from previously published numbers. SOURCE: U.S. Department of Education, National Center for Education Statistics, *Projections of Education Statistics*, various issues. (This table was prepared February 2010.)

*For more information about MAPEs, see Section A.O. Introduction, earlier in this appendix.*

**Table A-13. Estimated equations and model statistics for current expenditures per pupil in fall enrollment for public elementary and secondary schools, and education revenue from state sources per capita**

Dependent variable	Equation	R <sup>2</sup>	Breusch-Godfrey Serial Correlation LM test statistic <sup>1</sup>	Time period
Current expenditures per pupil	ln(CUREXP) = 0.58 + 0.64ln(PCI) + 0.20ln(SGRANT) + 0.92AR(1) (0.381) (3.892) (2.364) (17.622)	0.996	2.60 (0.27)	1973-74 to 2006-07
Education revenue from state sources per capita	ln(SGRNT) = 0.92 + 1.11ln(PCI) + 0.72ln(ENRPOP) + 0.55AR(1) (0.749) (19.170) (4.237) (4.138)	0.987	2.02 (0.37)	1973-74 to 2006-07

<sup>1</sup> AR(1) indicates that the model included an AR(1) term for correcting for first-order autocorrelation. To estimate the model, it was first transformed into a nonlinear model and then the coefficients were estimated simultaneously by applying a Marquardt nonlinear least squares algorithm to the transformed equation. For a general discussion of the problem of autocorrelation, and the method used to forecast in the presence of autocorrelation, see Judge, G., Hill, W., Griffiths, R., Lutkepohl, H., and Lee, T. *The Theory and Practice of Econometrics*, New York: John Wiley and Sons, 1985, pp. 315-318.

<sup>2</sup> Number in parentheses is Prob. Chi-Square(2) associated with the Breusch-Godfrey Serial Correlation LM Test. A *p* value greater than 0.05 implies that we do not reject the null hypothesis of no autocorrelation at the 5 or 10 percent significance levels. For an explanation of the Breusch-Godfrey Serial Correlation LM test statistic, see Greene, W. (2000). *Econometric Analysis*. New Jersey: Prentice-Hall.

NOTE: R<sup>2</sup> indicates the coefficient of determination. Numbers in parentheses are *t*-statistics.

CUREXP = Current expenditures of public elementary and secondary schools per pupil in fall enrollment in constant 1982-84 dollars.

SGRANT = Local governments' education revenue from state sources, per capita, in constant 1982-84 dollars.

PCI = Disposable income per capita in constant 2000 chained dollars.

ENRPOP = Ratio of fall enrollment to the population.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Elementary and Secondary School Current Expenditures Model, 1973-74 through 2006-07; and Revenue Receipts from State Sources Model, 1973-74 through 2006-07. (This table was prepared January 2010.)

## A.5. ENROLLMENT IN POSTSECONDARY DEGREE-GRANTING INSTITUTIONS

### Projections in this edition

This edition of *Projections of Education Statistics* presents projections of enrollment in degree-granting institutions for fall 2009 through fall 2019. Three different models were used to produce these enrollment projections:

- » The *Enrollment in Degree-Granting Institutions Model* produced projections of enrollments by attendance status, level of student, type of institution, control of institution, sex, and age. It also produced projections of full-time-equivalent enrollments by level of student, type of institution, and control of institution.
- » The *Enrollment in Degree-Granting Institutions by Race/Ethnicity Model* produced projections of enrollments by race/ethnicity.
- » The *First-Time Freshmen Model* produced projections of enrollments of first-time freshmen by sex.

### Overview of approach

#### *Basic features of the three degree-granting enrollment models*

The Enrollment in Degree-Granting Institutions Model is the primary model for projecting enrollment in degree-granting postsecondary institutions. For this model, enrollment rates by attendance status and sex are projected for various age categories using either the pooled seemingly unrelated regression method or the pooled seemingly unrelated regression method with a first-order autocorrelation correction. These rates are applied to projections of populations of the same sex and age to produce projections of enrollment by attendance status, sex, and age. To project enrollments by level of student, type of institution, and control of institution, rates for these characteristics are projected using single exponential smoothing and applied to enrollment projections previously produced by the model.

The Enrollment in Degree-Granting Institutions by Race/Ethnicity Model takes an approach similar to that of the Enrollment in Degree-Granting Institutions Model. Enrollment rates by attendance status, sex, and race/ethnicity are projected for the age categories using either the pooled seemingly unrelated regression method or the pooled seemingly unrelated regression method with a first-order autocorrelation correction. The resulting rates are iteratively corrected to ensure consistency with those projected by the Enrollment in Degree-Granting Institutions Model. The adjusted rates are then applied to projections of populations of the same sex, age, and race/ethnicity.

The First-Time Freshmen Enrollment in Degree-Granting Institutions Model uses single exponential smoothing to project the ratio of freshmen enrollment to undergraduate enrollment separately for males and for females. It then applies the projected ratios to the projections of undergraduate enrollment by sex that were produced by the Enrollment in Degree-Granting Institutions Model.

### The Enrollment in Degree-Granting Institutions Model

The Enrollment in Degree-Granting Institutions Model produces projections of enrollment counts by six levels of detail, as well as projections of full-time-equivalent enrollments by level of student, type of institution, and control of institution.

#### *Steps used in the Enrollment in Degree-Granting Institutions Model*

**Step 1.** *Adjust age-specific enrollment counts from the U.S. Census Bureau to make them agree with the more highly aggregated NCES enrollment counts that do not include age.* The Enrollment in Degree-Granting Institutions Model projects enrollments by six levels of detail: attendance status, level of student, type of institution, control of institution, sex, and age. While NCES does produce enrollment counts by the first five levels of detail, it does not produce data by the sixth level of detail, age, every year. However, the U.S. Census Bureau does produce age-specific enrollment counts.

In step 1, the age distributions from the Census Bureau counts for 1980 to 2008 were applied to the NCES counts to produce a set of enrollment data that breaks enrollments down by age while being consistent with NCES counts. Specifically, the most detailed level of Census Bureau data (by attendance status, level of student, type of institution, control of institution, sex, and age) was iteratively changed using proportions based on the more highly aggregated NCES enrollment numbers to ensure that all sums across this most detailed level of Census enrollment data equaled the more highly aggregated NCES enrollment totals that did not include age.

**Step 2.** Calculate enrollment rates by attendance status, sex, and age category. The enrollment data were broken up into 14 age categories, with separate age categories for individual ages 14 through 24 as well as for the age groups 25 to 29, 30 to 34, and 35 and over. For each of the 14 age categories, 4 enrollment rates were calculated—part-time male, full-time male, part-time female, and full-time female—resulting in a total of 56 enrollment rates. Each of the 56 enrollment rates was calculated by dividing the enrollment count for that combination of attendance status, sex, and age category by the total population for the corresponding combination of sex and age category. For each combination of attendance and sex, the enrollment rate for the oldest age category was calculated by dividing the enrollment count for those 35 and over by the total population for those 35 to 44.

**Step 3.** Produce projections of enrollment rates by attendance status, sex, and age category. Enrollment rates for most of the age groups were projected using multiple linear regression. However, because enrollment at degree-granting institutions is negligible for ages 14, 15, and 16, these ages were not included in the multiple linear regression models. Instead, projections for individual ages 14, 15, and 16 were produced by double exponential smoothing.

The following 11 age categories were modeled: individual ages 17 through 24 and age groups 25 to 29, 30 to 34, and 35 and over. For each of these age categories, enrollment rates by attendance status and sex were produced using 4 pooled time-series models—one for each combination of attendance status and sex. Each model was pooled across age categories. Each equation contained two independent variables, which were measures of

- » disposable income; and
- » the unemployment rate.

Either the pooled seemingly unrelated regression method or the pooled seemingly unrelated regression method with a first-order autocorrelation correction was used to estimate each equation.

*For more details on the equations used in step 3, the data used to estimate these equations, and their results, see tables A-14 through A-16 on pages 123–125.*

**Step 4.** Produce projections of enrollments by attendance status, sex, and age category. For each combination of attendance status, sex, and age category, enrollment projections were produced by multiplying the projected enrollment rate for that combination by projections of the total population with the corresponding combination of sex and age category.

**Step 5.** Add two additional levels of detail—level of student and type of institution—to the projected enrollments by attendance status, sex, and age category. For this step, the 14 age categories used in the previous steps were collapsed into the following 8 categories: ages 14 to 16, 17, 18 and 19, 20 and 21, 22 to 24, 25 to 29, 30 to 34, and 35 and over. Step 5 can be broken into three parts:

First, the historic data were used to calculate the percentage distribution of enrollment by level of student and type of institution for each combination of attendance status, sex, and age category. Because it was assumed that there was no enrollment in 2-year institutions at the postbaccalaureate level, three combinations of student level and institution type were used: undergraduates at 4-year institutions, undergraduates at 2-year institutions, and postbaccalaureate students at 4-year institutions.

Second, for each combination of attendance status, sex, and age category, the percentage distribution by level of student and type of institution was projected using single exponential smoothing with a smoothing constant of 0.4 and then adjusted so the sum of the categories by attendance status, level of student, type of institution, sex, and age category would equal 100 percent.

*For the projected percentage distributions from step 5 and the actual 2008 distributions, see tables A-17 and A-18 on pages 126–127.*

Third, the projected distributions by level of student and type of institution were applied to the projected enrollments by attendance status, sex, and age category from step 4 to obtain the enrollment projections by attendance status, level of student, type of institution, sex, and age category.

**Step 6.** Add the sixth level of detail—control of institutions—to the projected enrollments in degree-granting institutions. In this step, the data on enrollment by age category were not used. Control of institutions was added in the following manner:

First, the historic data were used to calculate the percentage of enrollment in public institutions for each combination of attendance status, level of student, type of institution, and sex.

Second, the percentages of enrollment in public institutions were projected using single exponential smoothing with a smoothing constant of 0.4.

*For the projected percentages from step 6 and the actual 2008 percentages, see table A-19 on page 127.*

Third, the projected percentages were applied to the projected enrollments in each corresponding enrollment combination to obtain projections for public institutions by attendance status, level of student, type of institution, and sex.

Fourth, the projected enrollments for public institutions were subtracted from the total to produce the projected enrollments for private institutions.

**Step 7. Produce projections of full-time-equivalent enrollment by level of student, type of institution, and control of institution.**

Full-time-equivalent enrollment represents total full-time and part-time enrollment as if it were enrollment on a full-time basis. It equals the sum of full-time enrollment plus the full-time-equivalent of part-time enrollment. Full-time-equivalent enrollment projections were produced in the following manner:

First, for each combination of level of student, type of institution, and control of institution, the historic data were used to calculate the full-time-equivalent of part-time enrollment as a percentage of part-time enrollment.

Second, for each combination of level of student, type of institution, and control of institution, the full-time equivalent of part-time enrollment as a percentage of part-time enrollment was projected using single exponential smoothing with a smoothing constant of 0.4.

Third, for each combination of level of student, type of institution, and control of institution, the projected percentages were applied to the projections of part-time enrollment to project the full-time equivalent of the part-time enrollment.

Fourth, the projections of full-time equivalents of part-time projections were added to projections of full-time enrollment to obtain projections of full-time-equivalent enrollment.

### *Data and equation results for the Enrollment in Degree-Granting Institutions Model*

**Enrollment data for degree-granting institutions.** Enrollment data for 1981 to 2008 by attendance status, level of student, type of institution, control of institution, and sex came from the NCES Integrated Postsecondary Education Data System (IPEDS). These are universe counts. The U.S. Census Bureau was the source for enrollment estimates for 1981 to 2008 by the characteristics listed above plus age.

**Population data and projections.** Population counts for 1980 to 2008 came from the U.S. Census Bureau. Population projections for 2009 to 2019 are the Census Bureau's 2008 National Population Projections of the population by sex and age (August 2008). For more information, see Section A.0. Introduction, earlier in this appendix.

**Projections for economic variables.** The economic variables used in developing these projections were from the "U.S. Monthly Model: November 2009 Short-Term Projections" from the economic consulting firm, IHS Global Insight.

**Data and results for the equations.** The following details for the equations are shown on pages 123–127:

- » Table A-14 shows enrollment rates by sex, attendance status, and age for fall 2008 and projected enrollment rates for fall 2014 and fall 2019.
- » Table A-15 shows the estimated equations and model statistics used to project enrollments for men by attendance status, and table A-16 shows the estimated equations and model statistics used to project enrollment rates for women by attendance status. The particular equations shown were selected on the basis of their statistical properties, such as coefficients of determination ( $R^2$ s), the  $t$ -statistics of the coefficients, the Durbin-Watson statistic, the Breusch-Godfrey Serial Correlation LM test statistic, and residual plots.
- » Table A-17 shows actual and projected percentage distributions of full-time students, and table A-18 shows actual and projected percentage distributions of part-time students.
- » Table A-19 shows actual and projected data for enrollment in public degree-granting institutions as a percentage of total enrollment.

### *Accuracy of projections for the Enrollment in Degree-Granting Institutions Model*

Mean absolute percentage errors (MAPEs) for enrollment in degree-granting institutions were calculated using the last 12 editions of *Projections of Education Statistics*. Exhibit A-7, below, shows MAPEs for key projections of the Enrollment in Degree-Granting Institutions Model.

**Exhibit A-7. Mean absolute percentage errors (MAPEs), by lead time for enrollment in degree-granting institutions: 2010**

Statistic	Lead time (years)									
	1	2	3	4	5	6	7	8	9	10
Total enrollment	1.4	2.4	2.9	3.4	4.6	6.1	8.0	9.8	10.1	10.4
Men	1.5	2.9	3.5	4.1	5.2	6.6	8.1	9.8	10.2	10.3
Women	1.5	2.4	3.0	3.2	4.2	5.8	7.9	9.8	9.9	10.4
4-year institutions	1.5	2.5	3.3	4.1	5.3	6.8	8.8	10.9	11.5	12.4
2-year institutions	2.0	3.4	3.8	4.0	4.8	5.0	6.6	7.8	7.6	6.9

NOTE: MAPEs for degree-granting institution enrollments were calculated using the last 12 editions of *Projections of Education Statistics*.

Calculations were made using unrounded numbers. Some data have been revised from previously published numbers.

SOURCE: U.S. Department of Education, National Center for Education Statistics, *Projections of Education Statistics*, various issues. (This table was prepared February 2010.)

For more information about MAPEs, see Section A.0. Introduction, earlier in this appendix.

## The Enrollment in Degree-Granting Institutions by Race/Ethnicity Model

The Enrollment in Degree-Granting Institutions by Race/Ethnicity Model projects enrollments in degree-granting institutions by attendance status, sex, age, and race/ethnicity. The following groups are projected in this model:

- » White;
- » Black;
- » Hispanic;
- » Asian/Pacific Islander;
- » American Indian/Alaska Native; and
- » nonresident alien.

See the Glossary for definitions of the five racial/ethnic categories and the nonresident alien category. (The race/ethnicity of nonresident aliens is unknown, but they are considered a racial/ethnic group for purposes of this analysis.)

### Steps used in the Degree-Granting Institutions by Race/Ethnicity Model

**Step 1.** Adjust U.S. Census Bureau enrollment counts by attendance status, sex, age, and race/ethnicity to make them sum to NCES enrollment counts by attendance status, sex, and race/ethnicity. For 1981 to 2008, the most detailed levels of Census Bureau enrollment data (by enrollment status, sex, age, and race/ethnicity) were iteratively changed using proportions that were based on the more highly aggregated NCES enrollment numbers to ensure that the sums across these most detailed levels of enrollment data equaled the more highly aggregated NCES enrollment numbers that did not include age.

**Step 2.** Calculate enrollment rates by attendance status, sex, age category, and race/ethnicity. The enrollment data were broken up into 14 age categories, with separate age categories for individual ages 14 through 24 as well as for the age groups 25 to 29, 30 to 34, and 35 and over. For each of the 14 age categories, enrollment rates were calculated for each combination of attendance status, sex, and the six racial/ethnic groups, resulting in a total of 336 enrollment rates. Each of the 336 enrollment rates was calculated by dividing the enrollment count for that combination of attendance status, sex, age category, and race/ethnicity by the total population for the corresponding combination of sex, age category, and race/ethnicity. For each combination of attendance status, sex and racial/ethnic group, the enrollment rate for the oldest age category was calculated by dividing the enrollment count for those 35 and over by the total population for those 35 to 44.

**Step 3.** Produce projections of enrollment rates by attendance status, sex, age category, and race/ethnicity. Enrollment rates for most of the age groups and racial/ethnic groups were projected using multiple linear regression. However, there were several exceptions:

- » Due to negligible enrollments for ages 14, 15, and 16, these ages were not included in the multiple linear regression models. Instead, projections for individual ages 14, 15, and 16 were produced by single exponential smoothing.
- » Due to the nature of the historical data, American Indian/Alaska Native enrollments were projected using single exponential smoothing.
- » Due to the nature of the historical data, non-resident alien enrollments were projected using patterns in recent historical growth.

Four racial/ethnic groups were modeled: White, Black, Hispanic, and Asian/Pacific Islander. Eleven age categories were modeled: individual ages 17 through 24 and age groups 25 to 29, 30 to 34, and 35 to 44. For each of the age categories, projected enrollment rates by attendance status, sex, and race/ethnicity were produced using 16 pooled time-series models—one for each combination of attendance status, sex, and the four racial/ethnic groups. Each equation included variables measuring

- » recent trends;
- » economic conditions (such as disposable income); and
- » demographic changes.

*For more information on the equations used to project enrollment rates for the combinations of attendance status, sex, and race/ethnicity, see tables A-20 through A-27, under “Data and equations used for the Enrollment in Degree-Granting Institutions by Race/Ethnicity Model,” below.*

The final set of projected rates by attendance status, sex, age, and race/ethnicity were controlled to enrollment rates by attendance status, sex, and age produced by the Enrollment in Degree-Granting Institutions Model to ensure consistency across models.

**Step 4.** *Produce projections of enrollments by attendance status, sex, age category, and race/ethnicity.* For each combination of attendance status, sex, age category, and race/ethnicity, enrollment projections were produced by multiplying the projected enrollment rate for that combination by projections of the total population with the corresponding combination of sex, age category, and race/ethnicity.

### *Data and equations used for the Enrollment in Degree-Granting Institutions by Race/Ethnicity Model*

**Enrollment data for degree-granting institutions by race/ethnicity.** Enrollment data for 1981 to 2008 by attendance status, sex, and race/ethnicity came from the NCES Integrated Postsecondary Education Data System (IPEDS). These are universe counts. The U.S. Census Bureau, Current Population Survey was the source for enrollment estimates for 1981 to 2008 by the characteristics listed above plus age.

**Population data and projections by race/ethnicity.** Population counts for 1981 to 2008 came from the U.S. Census Bureau, Population Estimates series. Population projections for 2009 to 2019 are the Census Bureau’s 2008 National Population Projections of the population by sex, age and race/ethnicity (August 2008).

**Projections for economic variables.** The economic variables used in developing these projections were from the “U.S. Monthly Model: November 2009 Short-Term Projections” from the economic consulting firm, IHS Global Insight.

**Estimated equations and model statistics.** Tables A-20 through A-27 show the estimated equations and model statistics used to project enrollment rates for the various combinations of attendance status, sex, and race/ethnicity.

### *Accuracy of projections for the Degree-Granting Institutions by Race/Ethnicity Model*

Because this is the fifth edition of *Projections of Education Statistics* to include enrollment projections by race/ethnicity projections, there are too few years of data to present the MAPEs.

## **The First-Time Freshmen Enrollment in Degree-Granting Institutions Model**

The First-Time Freshmen Enrollment in Degree-Granting Institutions Model produced projections of first-time freshman enrollment in degree-granting institutions by sex.

### *Steps used in the First-Time Freshmen Enrollment in Degree-Granting Institutions Model*

The projections were produced in the following manner:

**Step 1.** *Calculate the ratio of first-time freshman enrollment to undergraduate enrollment.* For 1975 to 2008, the ratio of first-time freshmen enrollment to undergraduate enrollment was calculated for males and females.

**Step 2.** *Project the ratio of first-time freshmen enrollment to undergraduate enrollment.* Separately for males and for females, the ratio was projected using single exponential smoothing with a smoothing constant of 0.4, yielding a constant value for males and a constant value for females over the forecast period.

**Step 3.** *Apply the projected ratio to projected undergraduate enrollment.* For each sex, the projected ratio was applied to projections of undergraduate enrollment by sex produced by the Enrollment in Degree-Granting Institutions Model to yield projections of first-time freshman enrollment.

### *Assumptions underlying this method*

This method assumes that the future pattern in the trend of first-time freshmen enrollment will be the same as that for undergraduate enrollment.

### *Data used in the First-Time Freshmen Enrollment in Degree-Granting Institutions Model*

**Undergraduate and freshmen enrollment data for degree-granting institutions.** Undergraduate and freshmen enrollment data by sex for 1975 to 2008 came from the NCES Integrated Postsecondary Education Data System (IPEDS).

**Projections of undergraduate enrollment.** Projections of undergraduate enrollment by sex came from the Enrollment in Degree-Granting Institutions Model, discussed earlier in this section of appendix A.

### *Accuracy of projections for the First-Time Freshmen Enrollment Model*

Because this is the second edition of *Projections of Education Statistics* to include projections of first-time freshmen, there are too few years of data to present the MAPEs.



**Table A-14. Actual and projected numbers for college enrollment rates, by sex, attendance status, and age: Fall 2008, 2014, and 2019**

Sex, attendance status, and age	Actual 2008	Projected	
		2014	2019
<b>Men</b>			
Full-time			
6 years old	0.5	0.4	0.4
17 years old	2.7	2.5	2.7
18 years old	30.2	31.3	32.9
19 years old	40.2	41.4	43.2
20 years old	35.5	36.4	38.1
21 years old	30.9	32.5	34.1
22 years old	20.2	22.7	23.9
23 years old	15.2	15.7	16.7
24 years old	13.3	12.8	13.7
25 to 29 years old	5.2	5.7	6.1
30 to 34 years old	2.3	2.5	2.6
35 to 44 years old	1.2	1.4	1.5
Part-time			
16 years old	#	0.1	0.1
17 years old	0.8	0.9	0.9
18 years old	6.1	6.3	6.3
19 years old	6.4	7.0	6.9
20 years old	9.4	8.7	8.7
21 years old	6.3	6.9	6.9
22 years old	7.3	7.7	7.7
23 years old	7.6	7.7	7.8
24 years old	7.1	7.5	7.6
25 to 29 years old	5.5	5.3	5.4
30 to 34 years old	4.1	4.1	4.2
35 to 44 years old	3.8	4.0	4.1
<b>Women</b>			
Full-time			
16 years old	0.6	0.5	0.5
17 years old	3.6	4.2	4.8
18 years old	42.8	44.5	47.7
19 years old	46.2	49.5	52.3
20 years old	43.6	46.1	49.0
21 years old	40.8	41.6	44.5
22 years old	25.8	28.1	30.6
23 years old	18.7	19.7	21.6
24 years old	15.0	15.1	16.8
25 to 29 years old	7.1	7.8	8.7
30 to 34 years old	3.1	3.5	4.0
35 to 44 years old	2.6	3.0	3.4
Part-time			
16 years old	0.1	0.2	0.2
17 years old	0.4	0.8	0.9
18 years old	6.3	6.4	6.7
19 years old	10.6	11.1	11.5
20 years old	10.6	11.2	11.6
21 years old	9.4	9.9	10.4
22 years old	10.9	11.5	12.3
23 years old	12.0	12.8	13.8
24 years old	11.4	11.6	12.7
25 to 29 years old	7.9	8.3	9.2
30 to 34 years old	5.7	5.7	6.3
35 to 44 years old	7.3	8.2	9.1

# Rounds to zero.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System, Spring 2009; Enrollment in Degree-Granting Institutions Model, 1980–2008; and U.S. Department of Commerce, Census Bureau, Current Population Reports, “Social and Economic Characteristics of Students,” 2008. (This table was prepared February 2010.)

**Table A-15. Estimated equations and model statistics for full-time and part-time college enrollment rates of men**

Independent variable	Coefficient	Standard error	t-statistic	R <sup>2</sup>	D.W. statistic
<b>Full-time</b>					
Intercept term for 17-year-olds	-7.59	0.287	-26.42	1.00	1.9*
Intercept term for 18-year-olds	-4.75	0.284	-16.71		
Intercept term for 19-year-olds	-4.34	0.214	-20.24		
Intercept term for 20-year-olds	-4.43	0.216	-20.49		
Intercept term for 21-year-olds	-4.59	0.216	-21.24		
Intercept term for 22-year-olds	-5.05	0.228	-22.17		
Intercept term for 23-year-olds	-5.51	0.217	-25.47		
Intercept term for 24-year-olds	-5.88	0.223	-26.35		
Intercept term for 25- to 29-year-olds	-6.60	0.219	-30.09		
Intercept term for 30- to 34-year-olds	-7.59	0.238	-31.83		
Intercept term for 35- to 44-year-olds	-8.11	0.251	-32.36		
Log of three-period weighted average of per capita disposable income in 2000 dollars, using the present period and the previous two periods	0.69	0.037	18.75		
Log of age-specific unemployment rate for men	0.17	0.018	9.07		
Autocorrelation coefficient for 17-year-olds	0.88	0.040	22.30		
Autocorrelation coefficient for 18-year-olds	0.91	0.043	21.31		
Autocorrelation coefficient for 19-year-olds	0.47	0.122	3.83		
Autocorrelation coefficient for 20-year-olds	0.59	0.123	4.84		
Autocorrelation coefficient for 21-year-olds	0.57	0.122	4.71		
Autocorrelation coefficient for 22-year-olds	0.83	0.121	6.88		
Autocorrelation coefficient for 23-year-olds	0.64	0.113	5.65		
Autocorrelation coefficient for 24-year-olds	0.75	0.125	5.98		
Autocorrelation coefficient for 25- to 29-year-olds	0.69	0.069	9.98		
Autocorrelation coefficient for 30- to 34-year-olds	0.85	0.077	11.05		
Autocorrelation coefficient for 35- to 44-year-olds	0.87	0.068	12.73		
<b>Part-time</b>					
Intercept term for 17-year-olds	-7.66	0.364	-21.06	0.99	1.9*
Intercept term for 18-year-olds	-5.25	0.299	-17.57		
Intercept term for 19-year-olds	-4.79	0.394	-12.17		
Intercept term for 20-year-olds	-4.71	0.320	-14.71		
Intercept term for 21-year-olds	-4.90	0.286	-17.13		
Intercept term for 22-year-olds	-5.04	0.292	-17.28		
Intercept term for 23-year-olds	-5.08	0.284	-17.89		
Intercept term for 24-year-olds	-5.13	0.285	-18.01		
Intercept term for 25- to 29-year-olds	-5.58	0.301	-18.54		
Intercept term for 30- to 34-year-olds	-5.97	0.296	-20.19		
Intercept term for 35- to 44-year-olds	-5.94	0.285	-20.82		
Log of three-period weighted average of per capita disposable income in 2000 dollars, using the present period and the previous two periods	0.40	0.045	8.86		
Log of unemployment rate	0.15	0.024	5.98		
Autocorrelation coefficient for 17-year-olds	0.73	0.114	6.39		
Autocorrelation coefficient for 18-year-olds	0.78	0.078	10.01		
Autocorrelation coefficient for 19-year-olds	0.94	0.056	16.75		
Autocorrelation coefficient for 20-year-olds	0.84	0.104	8.08		
Autocorrelation coefficient for 21-year-olds	0.57	0.094	6.01		
Autocorrelation coefficient for 22-year-olds	0.72	0.079	9.20		
Autocorrelation coefficient for 23-year-olds	0.42	0.097	4.36		
Autocorrelation coefficient for 24-year-olds	0.54	0.110	4.87		
Autocorrelation coefficient for 25- to 29-year-olds	0.89	0.049	18.02		
Autocorrelation coefficient for 30- to 34-year-olds	0.88	0.044	20.01		
Autocorrelation coefficient for 35- to 44-year-olds	0.60	0.063	9.48		

\*  $p < .05$ .R<sup>2</sup> = Coefficient of determination.D.W. statistic = Durbin-Watson statistic, a test for autocorrelation among regression residuals. For more details, see Johnston, J., and Dinardo, J. (1996). *Econometric Methods*, New York: McGraw-Hill.NOTE: The regression method used to estimate the full-time and part-time equations was the pooled seemingly unrelated regression method with a first-order autocorrelation correction. The time period used to estimate both equations is from 1980 to 2008, and the number of observations is 308 after the correction for autocorrelation. For additional information, see Intriligator, M.D. (1978). *Econometric Models, Techniques, & Applications*. New Jersey: Prentice-Hall, Inc., pp. 165–173.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Enrollment in Degree-Granting Institutions Model, 1980–2008. (This table was prepared January 2010.)

**Table A-16. Estimated equations and model statistics for full-time and part-time college enrollment rates of women**

Independent variable	Coefficient	Standard error	t-statistic	R <sup>2</sup>	D.W. statistic
<b>Full-time</b>					
Intercept term for 17-year-olds	-9.30	0.163	-57.05	1.00	1.31**
Intercept term for 18-year-olds	-6.56	0.143	-45.81		
Intercept term for 19-year-olds	-6.44	0.138	-46.54		
Intercept term for 20-year-olds	-6.62	0.137	-48.26		
Intercept term for 21-year-olds	-6.84	0.137	-49.82		
Intercept term for 22-year-olds	-7.50	0.139	-54.04		
Intercept term for 23-year-olds	-8.01	0.141	-57.00		
Intercept term for 24-year-olds	-8.39	0.142	-59.16		
Intercept term for 25- to 29-year-olds	-9.07	0.141	-64.39		
Intercept term for 30- to 34-year-olds	-9.77	0.139	-70.34		
Intercept term for 35- to 44-year-olds	-9.99	0.139	-71.78		
Log of three-period weighted average of per capita disposable income in 2000 dollars, using the present period and the previous two periods	1.11	0.029	38.30		
Log of age-specific unemployment rate for women	0.16	0.039	4.00		
<b>Part-time</b>					
Intercept term for 17-year-olds	-11.09	0.436	-25.42	0.99	1.91*
Intercept term for 18-year-olds	-8.53	0.344	-24.80		
Intercept term for 19-year-olds	-7.99	0.327	-24.43		
Intercept term for 20-year-olds	-8.13	0.324	-25.09		
Intercept term for 21-year-olds	-8.16	0.320	-25.52		
Intercept term for 22-year-olds	-8.32	0.320	-25.97		
Intercept term for 23-year-olds	-8.39	0.322	-26.07		
Intercept term for 24-year-olds	-8.44	0.325	-25.97		
Intercept term for 25- to 29-year-olds	-8.91	0.335	-26.61		
Intercept term for 30- to 34-year-olds	-9.38	0.334	-28.07		
Intercept term for 35- to 44-year-olds	-9.09	0.345	-26.37		
Log of three-period weighted average of per capita disposable income in 2000 dollars, using the present period and the previous two periods	1.01	0.050	20.05		
Log of unemployment rate	0.14	0.026	5.59		
Autocorrelation coefficient for 17-year-olds	0.76	0.080	9.42		
Autocorrelation coefficient for 18-year-olds	0.78	0.076	10.29		
Autocorrelation coefficient for 19-year-olds	0.76	0.073	10.30		
Autocorrelation coefficient for 20-year-olds	0.65	0.101	6.38		
Autocorrelation coefficient for 21-year-olds	0.36	0.129	2.79		
Autocorrelation coefficient for 22-year-olds	0.47	0.098	4.80		
Autocorrelation coefficient for 23-year-olds	0.52	0.076	6.88		
Autocorrelation coefficient for 24-year-olds	0.73	0.064	11.33		
Autocorrelation coefficient for 25- to 29-year-olds	0.89	0.034	26.37		
Autocorrelation coefficient for 30- to 34-year-olds	0.91	0.025	36.32		
Autocorrelation coefficient for 35- to 44-year-olds	0.92	0.025	36.80		

\*  $p < .05$ .

\*\* Inconclusive.

R<sup>2</sup> = Coefficient of determination.D.W. statistic = Durbin-Watson statistic, a test for autocorrelation among regression residuals. For more details, see Johnston, J., and Dinardo, J. (1996). *Econometric Methods*. New York: McGraw-Hill.NOTE: The regression method used to estimate the full-time equation was the pooled seemingly unrelated regression method. The regression method used to estimate the part-time equation was the pooled seemingly unrelated regression method with a first-order autocorrelation correction. The time period used to estimate both equations is from 1980 to 2008. The number of observations for the full-time equation is 319 and the number of observations for the part-time equation, after the correction for autocorrelation, is 308. For additional information, see Intriligator, M.D. (1978). *Econometric Models, Techniques, & Applications*. New Jersey: Prentice-Hall, Inc., pp. 165-173.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Enrollment in Degree-Granting Institutions Model, 1980-2008. (This table was prepared January 2010.)

**Table A-17. Actual and projected numbers for the percentage distribution of full-time students at degree-granting institutions, by sex and age group: Fall 2008, and 2009 through 2019**

Age and institution type	Men		Women	
	Actual 2008	Projected 2009 through 2019	Actual 2008	Projected 2009 through 2019
<b>18 and 19 years old</b>				
Undergraduate, 4-year institutions	66.4	65.8	67.4	67.7
Undergraduate, 2-year institutions	33.4	33.9	32.8	32.1
Postbaccalaureate, 4-year institutions	0.3	0.3	#	0.3
<b>20 and 21 years old</b>				
Undergraduate, 4-year institutions	77.6	77.5	79.7	79.5
Undergraduate, 2-year institutions	20.6	20.7	18.4	18.6
Postbaccalaureate, 4-year institutions	1.8	1.8	1.9	2.0
<b>22 to 24 years old</b>				
Undergraduate, 4-year institutions	62.1	64.1	60.3	60.4
Undergraduate, 2-year institutions	17.5	16.8	16.7	16.9
Postbaccalaureate, 4-year institutions	20.4	19.1	23.1	22.7
<b>25 to 29 years old</b>				
Undergraduate, 4-year institutions	44.9	43.5	39.7	40.2
Undergraduate, 2-year institutions	18.3	18.1	21.7	22.7
Postbaccalaureate, 4-year institutions	36.8	38.4	38.6	37.0
<b>30 to 34 years old</b>				
Undergraduate, 4-year institutions	38.7	36.9	39.7	39.4
Undergraduate, 2-year institutions	23.2	21.6	29.0	30.7
Postbaccalaureate, 4-year institutions	38.1	41.4	31.3	29.9
<b>35 years and over</b>				
Undergraduate, 4-year institutions	39.9	40.2	45.4	43.4
Undergraduate, 2-year institutions	20.0	23.2	28.7	30.1
Postbaccalaureate, 4-year institutions	40.1	36.6	25.9	26.5

# Rounds to zero.

NOTE: Detail may not sum to totals because of rounding.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System, Spring 2009; Enrollment in Degree-Granting Institutions Model, 1980–2008; and U.S. Department of Commerce, Census Bureau, Current Population Reports, “Social and Economic Characteristics of Students,” 2008. (This table was prepared February 2010.)

**Table A-18. Actual and projected numbers for the percentage distribution of part-time students at degree-granting institutions, by sex and age group: Fall 2008, and 2009 through 2019**

Age and institution type	Men		Women	
	Actual 2008	Projected 2009 through 2019	Actual 2008	Projected 2009 through 2019
<b>18 and 19 years old</b>				
Undergraduate, 4-year institutions	14.9	17.6	20.4	20.4
Undergraduate, 2-year institutions	85.0	82.1	79.9	79.4
Postbaccalaureate, 4-year institutions	0.1	0.3	#	0.3
<b>20 and 21 years old</b>				
Undergraduate, 4-year institutions	33.3	30.9	30.4	31.5
Undergraduate, 2-year institutions	66.2	68.7	69.4	67.8
Postbaccalaureate, 4-year institutions	0.6	0.4	0.2	0.7
<b>22 to 24 years old</b>				
Undergraduate, 4-year institutions	31.8	32.5	31.0	29.6
Undergraduate, 2-year institutions	61.2	59.4	55.3	57.2
Postbaccalaureate, 4-year institutions	7.0	8.1	13.7	13.1
<b>25 to 29 years old</b>				
Undergraduate, 4-year institutions	25.3	26.3	26.0	24.7
Undergraduate, 2-year institutions	55.6	54.1	53.4	53.5
Postbaccalaureate, 4-year institutions	19.1	19.6	20.5	21.8
<b>30 to 34 years old</b>				
Undergraduate, 4-year institutions	25.5	24.5	26.4	25.1
Undergraduate, 2-year institutions	51.4	49.9	49.5	50.8
Postbaccalaureate, 4-year institutions	23.1	25.6	24.1	24.2
<b>35 years and over</b>				
Undergraduate, 4-year institutions	28.4	25.7	25.4	24.4
Undergraduate, 2-year institutions	44.7	47.3	50.0	50.9
Postbaccalaureate, 4-year institutions	26.9	26.9	24.6	24.6

# Rounds to zero.

NOTE: Detail may not sum to totals because of rounding.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System, Spring 2009; Enrollment in Degree-Granting Institutions Model, 1980–2008; and U.S. Department of Commerce, Census Bureau, Current Population Reports, “Social and Economic Characteristics of Students,” 2008. (This table was prepared February 2010.)

**Table A-19. Actual and projected numbers for enrollment in public degree-granting institutions as a percent of total public and private enrollment, by sex, attendance status, level enrolled, and type of institution: Fall 2008, and 2009 through 2019**

Enrollment category	Men		Women	
	Actual 2008	Projected 2009 through 2019	Actual 2008	Projected 2009 through 2019
Full-time, undergraduate, 4-year institutions	65.1	65.5	61.1	62.2
Part-time, undergraduate, 4-year institutions	67.5	69.3	63.4	65.8
Full-time, undergraduate, 2-year institutions	92.2	92.0	88.3	89.0
Part-time, undergraduate, 2-year institutions	99.2	99.2	98.7	98.7
Full-time, postbaccalaureate, 4-year institutions	49.0	49.0	46.4	46.4
Part-time, postbaccalaureate, 4-year institutions	53.0	53.0	54.5	54.5

SOURCE: U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System, Spring 2009; and Enrollment in Degree-Granting Institutions Model, 1980–2008. (This table was prepared February 2010.)

**Table A-20. Estimated equations and model statistics for full-time and part-time college enrollment rates of White men**

Independent variable	Coefficient	Standard error	t-statistic	R <sup>2</sup>	D.W. statistic
<b>Full-time</b>					
Intercept term for 17-year-olds	-8.46	0.166	-51.11	1.00	1.50*
Intercept term for 18-year-olds	-5.45	0.145	-37.70		
Intercept term for 19-year-olds	-5.23	0.140	-37.24		
Intercept term for 20-year-olds	-5.42	0.141	-38.53		
Intercept term for 21-year-olds	-5.57	0.141	-39.62		
Intercept term for 22-year-olds	-6.05	0.141	-42.80		
Intercept term for 23-year-olds	-6.61	0.141	-46.79		
Intercept term for 24-year-olds	-7.04	0.143	-49.23		
Intercept term for 25- to 29-year-olds	-7.88	0.141	-55.81		
Intercept term for 30- to 34-year-olds	-8.93	0.144	-62.01		
Intercept term for 35- to 44-year-olds	-9.55	0.146	-65.45		
Log of White per capita disposable income in current dollars	0.25	0.007	34.39		
<b>Part-time</b>					
Intercept term for 17-year-olds	-5.24	0.153	-34.37	0.99	1.53*
Intercept term for 18-year-olds	-1.91	0.077	-24.86		
Intercept term for 19-year-olds	-1.50	0.092	-16.33		
Intercept term for 20-year-olds	-1.52	0.077	-19.69		
Intercept term for 21-year-olds	-1.56	0.078	-20.01		
Intercept term for 22-year-olds	-1.72	0.076	-22.62		
Intercept term for 23-year-olds	-1.76	0.071	-24.71		
Intercept term for 24-year-olds	-1.79	0.070	-25.38		
Intercept term for 25- to 29-year-olds	-2.10	0.070	-29.84		
Intercept term for 30- to 34-year-olds	-2.55	0.073	-34.77		
Intercept term for 35- to 44-year-olds	-2.60	0.069	-37.73		
Log of real total private compensation employment cost index	0.91	0.088	10.26		

\*  $p < .05$ .

R<sup>2</sup> = Coefficient of determination.

D.W. statistic = Durbin-Watson statistic, a test for autocorrelation among regression residuals. For more details, see Johnston, J., and Dinardo, J. (1996). *Econometric Methods*. New York: McGraw-Hill.

NOTE: The regression method used to estimate the full-time and part-time equations was the pooled seemingly unrelated regression method. The time period used to estimate the equations is from 1980 to 2008. The number of observations is 319. For additional information, see Intriligator, M.D. (1978). *Econometric Models, Techniques, & Applications*. New Jersey: Prentice-Hall, Inc., pp. 165–173. Race categories exclude persons of Hispanic ethnicity.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Enrollment in Degree-Granting Institutions by Race/Ethnicity Model, 1980–2008. (This table was prepared January 2010.)

**Table A-21. Estimated equations and model statistics for full-time and part-time college enrollment rates of White women**

Independent variable	Coefficient	Standard error	t-statistic	R <sup>2</sup>	D.W. statistic
<b>Full-time</b>					
Intercept term for 17-year-olds	-13.29	0.227	-58.47	1.00	1.49*
Intercept term for 18-year-olds	-10.35	0.207	-49.96		
Intercept term for 19-year-olds	-10.24	0.204	-50.22		
Intercept term for 20-year-olds	-10.48	0.204	-51.30		
Intercept term for 21-year-olds	-10.74	0.205	-52.45		
Intercept term for 22-year-olds	-11.47	0.206	-55.76		
Intercept term for 23-year-olds	-12.05	0.207	-58.15		
Intercept term for 24-year-olds	-12.45	0.207	-60.12		
Intercept term for 25- to 29-year-olds	-13.25	0.205	-64.51		
Intercept term for 30- to 34-year-olds	-13.96	0.205	-68.27		
Intercept term for 35- to 44-year-olds	-14.15	0.205	-69.04		
Log of White per capita disposable income in current dollars	0.52	0.011	49.67		
<b>Part-time</b>					
Intercept term for 17-year-olds	-8.96	0.277	-32.32	0.81	1.60*
Intercept term for 18-year-olds	-5.78	0.220	-26.29		
Intercept term for 19-year-olds	-5.34	0.223	-23.90		
Intercept term for 20-year-olds	-5.41	0.222	-24.32		
Intercept term for 21-year-olds	-5.49	0.220	-24.95		
Intercept term for 22-year-olds	-5.67	0.219	-25.88		
Intercept term for 23-year-olds	-5.73	0.219	-26.14		
Intercept term for 24-year-olds	-5.75	0.218	-26.30		
Intercept term for 25- to 29-year-olds	-6.07	0.217	-27.97		
Intercept term for 30- to 34-year-olds	-6.40	0.219	-29.20		
Intercept term for 35- to 44-year-olds	-6.08	0.217	-27.97		
Log of real total private compensation employment cost index	0.18	0.011	16.15		

\*  $p < .05$ .R<sup>2</sup> = Coefficient of determination.D.W. statistic = Durbin-Watson statistic, a test for autocorrelation among regression residuals. For more details, see Johnston, J., and Dinardo, J. (1996). *Econometric Methods*. New York: McGraw-Hill.NOTE: The regression method used to estimate the full-time and part-time equations was the pooled seemingly unrelated regression method. The time period used to estimate the equations is from 1980 to 2008. The number of observations is 319. For additional information, see Intriligator, M.D. (1978). *Econometric Models, Techniques, & Applications*. New Jersey: Prentice-Hall, Inc., pp. 165–173. Race categories exclude persons of Hispanic ethnicity.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Enrollment in Degree-Granting Institutions by Race/Ethnicity Model, 1980–2008. (This table was prepared January 2010.)

**Table A-22. Estimated equations and model statistics for full-time and part-time college enrollment rates of Black men**

Independent variable	Coefficient	Standard error	t-statistic	R <sup>2</sup>	D.W. statistic
<b>Full-time</b>					
Intercept term for 17-year-olds	-9.66	0.436	-22.16	0.97	1.58*
Intercept term for 18-year-olds	-7.45	0.430	-17.32		
Intercept term for 19-year-olds	-7.20	0.430	-16.74		
Intercept term for 20-year-olds	-7.29	0.430	-16.93		
Intercept term for 21-year-olds	-7.56	0.431	-17.57		
Intercept term for 22-year-olds	-7.73	0.432	-17.89		
Intercept term for 23-year-olds	-8.23	0.436	-18.91		
Intercept term for 24-year-olds	-8.51	0.433	-19.68		
Intercept term for 25- to 29-year-olds	-9.28	0.433	-21.45		
Intercept term for 30- to 34-year-olds	-10.08	0.438	-23.02		
Intercept term for 35- to 44-year-olds	-10.45	0.434	-24.07		
Log of Black per capita disposable income in current dollars	0.32	0.023	13.61		
<b>Part-time</b>					
Intercept term for 17-year-olds	-9.85	0.334	-29.48	0.66	1.85*
Intercept term for 18-year-olds	-9.01	0.365	-24.71		
Intercept term for 19-year-olds	-8.17	0.342	-23.93		
Intercept term for 20-year-olds	-8.12	0.339	-23.98		
Intercept term for 21-year-olds	-8.08	0.329	-24.60		
Intercept term for 22-year-olds	-8.15	0.345	-23.64		
Intercept term for 23-year-olds	-8.37	0.352	-23.75		
Intercept term for 24-year-olds	-8.38	0.354	-23.68		
Intercept term for 25- to 29-year-olds	-8.47	0.327	-25.89		
Intercept term for 30- to 34-year-olds	-8.68	0.326	-26.66		
Intercept term for 35- to 44-year-olds	-8.75	0.323	-27.12		
Log of Black per capita disposable income in current dollars	0.28	0.017	16.10		

\*  $p < .05$ .R<sup>2</sup> = Coefficient of determination.D.W. statistic = Durbin-Watson statistic, a test for autocorrelation among regression residuals. For more details, see Johnston, J., and Dinardo, J. (1996). *Econometric Methods*. New York: McGraw-Hill.NOTE: The regression method used to estimate the full-time and part-time equations was the pooled seemingly unrelated regression method. The time period used to estimate the equations is from 1980 to 2008. The number of observations is 319. For additional information, see Intriligator, M.D. (1978). *Econometric Models, Techniques, & Applications*. New Jersey: Prentice-Hall, Inc., pp. 165–173. Race categories exclude persons of Hispanic ethnicity.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Enrollment in Degree-Granting Institutions by Race/Ethnicity Model, 1980–2008. (This table was prepared January 2010.)



**Table A-23. Estimated equations and model statistics for full-time and part-time college enrollment rates of Black women**

Independent variable	Coefficient	Standard error	t-statistic	R <sup>2</sup>	D.W. statistic
<b>Full-time</b>					
Intercept term for 17-year-olds	-14.59	0.601	-24.27	0.97	1.77*
Intercept term for 18-year-olds	-12.44	0.595	-20.90		
Intercept term for 19-year-olds	-12.23	0.594	-20.58		
Intercept term for 20-year-olds	-12.50	0.595	-21.02		
Intercept term for 21-year-olds	-12.64	0.594	-21.26		
Intercept term for 22-year-olds	-13.11	0.594	-22.05		
Intercept term for 23-year-olds	-13.40	0.595	-22.52		
Intercept term for 24-year-olds	-13.76	0.596	-23.07		
Intercept term for 25- to 29-year-olds	-14.54	0.597	-24.38		
Intercept term for 30- to 34-year-olds	-15.02	0.595	-25.24		
Intercept term for 35- to 44-year-olds	-15.39	0.595	-25.85		
Log of Black per capita disposable income in current dollars	0.62	0.032	19.29		
<b>Part-time</b>					
Intercept term for 17-year-olds	-14.11	0.622	-22.69	0.64	1.79*
Intercept term for 18-year-olds	-12.69	0.622	-20.42		
Intercept term for 19-year-olds	-12.31	0.621	-19.82		
Intercept term for 20-year-olds	-12.35	0.620	-19.93		
Intercept term for 21-year-olds	-12.26	0.620	-19.76		
Intercept term for 22-year-olds	-12.25	0.620	-19.74		
Intercept term for 23-year-olds	-12.24	0.620	-19.76		
Intercept term for 24-year-olds	-12.43	0.620	-20.05		
Intercept term for 25- to 29-year-olds	-12.60	0.615	-20.49		
Intercept term for 30- to 34-year-olds	-12.72	0.616	-20.65		
Intercept term for 35- to 44-year-olds	-12.59	0.615	-20.48		
Log of Black per capita disposable income in current dollars	0.53	0.033	15.95		

\*  $p < .05$ .R<sup>2</sup> = Coefficient of determination.D.W. statistic = Durbin-Watson statistic, a test for autocorrelation among regression residuals. For more details, see Johnston, J., and Dinardo, J. (1996). *Econometric Methods*. New York: McGraw-Hill.NOTE: The regression method used to estimate the full-time and part-time equations was the pooled seemingly unrelated regression method. The time period used to estimate the equations is from 1980 to 2008. The number of observations is 319. For additional information, see Intriligator, M.D. (1978). *Econometric Models, Techniques, & Applications*. New Jersey: Prentice-Hall, Inc., pp. 165–173. Race categories exclude persons of Hispanic ethnicity.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Enrollment in Degree-Granting Institutions by Race/Ethnicity Model, 1980–2008. (This table was prepared January 2010.)

**Table A-24. Estimated equations and model statistics for full-time and part-time college enrollment rates of Hispanic men**

Independent variable	Coefficient	Standard error	t-statistic	R <sup>2</sup>	D.W. statistic
<b>Full-time</b>					
Intercept term for 17-year-olds	-10.64	0.550	-19.34	0.94	1.92*
Intercept term for 18-year-olds	-8.69	0.541	-16.05		
Intercept term for 19-year-olds	-8.47	0.541	-15.66		
Intercept term for 20-year-olds	-8.69	0.541	-16.07		
Intercept term for 21-year-olds	-8.90	0.544	-16.34		
Intercept term for 22-year-olds	-9.37	0.543	-17.25		
Intercept term for 23-year-olds	-9.66	0.544	-17.77		
Intercept term for 24-year-olds	-9.81	0.543	-18.08		
Intercept term for 25- to 29-year-olds	-10.64	0.544	-19.57		
Intercept term for 30- to 34-year-olds	-11.44	0.545	-20.99		
Intercept term for 35- to 44-year-olds	-11.95	0.550	-21.73		
Log of Hispanic per capita disposable income in current dollars	0.37	0.030	12.46		
<b>Part-time</b>					
Intercept term for 17-year-olds	-10.25	0.390	-26.29	0.73	1.79*
Intercept term for 18-year-olds	-8.67	0.386	-22.45		
Intercept term for 19-year-olds	-8.38	0.394	-21.27		
Intercept term for 20-year-olds	-8.28	0.385	-21.48		
Intercept term for 21-year-olds	-8.29	0.385	-21.54		
Intercept term for 22-year-olds	-8.65	0.383	-22.56		
Intercept term for 23-year-olds	-8.65	0.394	-21.96		
Intercept term for 24-year-olds	-8.67	0.384	-22.59		
Intercept term for 25- to 29-year-olds	-9.04	0.374	-24.17		
Intercept term for 30- to 34-year-olds	-9.48	0.377	-25.18		
Intercept term for 35- to 44-year-olds	-9.51	0.374	-25.44		
Log of Hispanic per capita disposable income in current dollars	0.31	0.020	15.12		

\*  $p < .05$ .R<sup>2</sup> = Coefficient of determination.D.W. statistic = Durbin-Watson statistic, a test for autocorrelation among regression residuals. For more details, see Johnston, J., and Dinardo, J. (1996). *Econometric Methods*. New York: McGraw-Hill.NOTE: The regression method used to estimate the full-time and part-time equations was the pooled seemingly unrelated regression method. The time period used to estimate the equations is from 1980 to 2008. The number of observations is 319. For additional information, see Intriligator, M.D. (1978). *Econometric Models, Techniques, & Applications*. New Jersey: Prentice-Hall, Inc., pp. 165–173.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Enrollment in Degree-Granting Institutions by Race/Ethnicity Model, 1980–2008. (This table was prepared January 2010.)

**Table A-25. Estimated equations and model statistics for full-time and part-time college enrollment rates of Hispanic women**

Independent variable	Coefficient	Standard error	t-statistic	R <sup>2</sup>	D.W. statistic
<b>Full-time</b>					
Intercept term for 17-year-olds	-17.24	0.434	-39.69	0.95	1.90*
Intercept term for 18-year-olds	-14.74	0.412	-35.80		
Intercept term for 19-year-olds	-14.65	0.409	-35.82		
Intercept term for 20-year-olds	-14.98	0.410	-36.51		
Intercept term for 21-year-olds	-15.12	0.411	-36.81		
Intercept term for 22-year-olds	-15.70	0.415	-37.87		
Intercept term for 23-year-olds	-16.00	0.412	-38.87		
Intercept term for 24-year-olds	-16.47	0.420	-39.25		
Intercept term for 25- to 29-year-olds	-17.09	0.409	-41.75		
Intercept term for 30- to 34-year-olds	-17.78	0.413	-43.03		
Intercept term for 35- to 44-year-olds	-18.08	0.416	-43.43		
Log of Hispanic per capita disposable income in current dollars	0.73	0.022	32.89		
<b>Part-time</b>					
Intercept term for 17-year-olds	-15.03	0.486	-30.92	0.73	1.87*
Intercept term for 18-year-olds	-12.95	0.473	-27.39		
Intercept term for 19-year-olds	-12.62	0.468	-26.96		
Intercept term for 20-year-olds	-12.89	0.475	-27.11		
Intercept term for 21-year-olds	-12.73	0.476	-26.76		
Intercept term for 22-year-olds	-13.06	0.476	-27.42		
Intercept term for 23-year-olds	-12.88	0.470	-27.42		
Intercept term for 24-year-olds	-13.15	0.474	-27.72		
Intercept term for 25- to 29-year-olds	-13.45	0.464	-29.02		
Intercept term for 30- to 34-year-olds	-13.82	0.463	-29.82		
Intercept term for 35- to 44-year-olds	-13.66	0.462	-29.55		
Log of Hispanic per capita disposable income in current dollars	0.57	0.025	22.55		

\*  $p < .05$ .R<sup>2</sup> = Coefficient of determination.D.W. statistic = Durbin-Watson statistic, a test for autocorrelation among regression residuals. For more details, see Johnston, J., and Dinardo, J. (1996). *Econometric Methods*. New York: McGraw-Hill.NOTE: The regression method used to estimate the full-time and part-time equations was the pooled seemingly unrelated regression method. The time period used to estimate the equations is from 1980 to 2008. The number of observations is 319. For additional information, see Intriligator, M.D. (1978). *Econometric Models, Techniques, & Applications*. New Jersey: Prentice-Hall, Inc., pp. 165–173.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Enrollment in Degree-Granting Institutions by Race/Ethnicity Model, 1980–2008. (This table was prepared January 2010.)

**Table A-26. Estimated equations and model statistics for full-time and part-time college enrollment rates of Asian/Pacific Islander men**

Independent variable	Coefficient	Standard error	t-statistic	R <sup>2</sup>	D.W. statistic
<b>Full-time</b>					
Intercept term for 17-year-olds	-8.82	0.331	-14.87	0.94	1.92*
Intercept term for 18-year-olds	-5.97	0.298	-10.11		
Intercept term for 19-year-olds	-5.77	0.303	-9.69		
Intercept term for 20-year-olds	-5.89	0.299	-9.94		
Intercept term for 21-year-olds	-5.88	0.301	-9.87		
Intercept term for 22-year-olds	-6.20	0.300	-10.48		
Intercept term for 23-year-olds	-6.52	0.301	-10.88		
Intercept term for 24-year-olds	-6.86	0.306	-11.46		
Intercept term for 25- to 29-year-olds	-7.67	0.300	-13.19		
Intercept term for 30- to 34-year-olds	-8.69	0.302	-14.98		
Intercept term for 35- to 44-year-olds	-9.47	0.299	-16.47		
Log of Asian/Pacific Islander per capita disposable income in current dollars	0.29	0.015	19.20		
<b>Part-time</b>					
Intercept term for 17-year-olds	-4.60	0.591	-7.78	0.71	1.85*
Intercept term for 18-year-olds	-3.58	0.584	-6.12		
Intercept term for 19-year-olds	-2.80	0.578	-4.84		
Intercept term for 20-year-olds	-2.93	0.590	-4.96		
Intercept term for 21-year-olds	-3.00	0.590	-5.09		
Intercept term for 22-year-olds	-2.97	0.605	-4.91		
Intercept term for 23-year-olds	-3.08	0.582	-5.29		
Intercept term for 24-year-olds	-3.34	0.577	-5.80		
Intercept term for 25- to 29-year-olds	-3.72	0.563	-6.60		
Intercept term for 30- to 34-year-olds	-4.18	0.563	-7.42		
Intercept term for 35- to 44-year-olds	-4.59	0.562	-8.18		
Log of Asian/Pacific Islander per capita disposable income in current dollars	0.07	0.029	2.43		

\*  $p < .05$ .

R<sup>2</sup> = Coefficient of determination.

D.W. statistic = Durbin-Watson statistic, a test for autocorrelation among regression residuals. For more details, see Johnston, J., and Dinardo, J. (1996). *Econometric Methods*. New York: McGraw-Hill.

NOTE: The regression method used to estimate the full-time and part-time equations was the pooled seemingly unrelated regression method. The time period used to estimate the equations is from 1989 to 2008. The number of observations is 220. For additional information, see Intriligator, M.D. (1978). *Econometric Models, Techniques, & Applications*. New Jersey: Prentice-Hall, Inc., pp. 165–173. Race categories exclude persons of Hispanic ethnicity.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Enrollment in Degree-Granting Institutions by Race/Ethnicity Model, 1980–2008. (This table was prepared January 2010.)

**Table A-27. Estimated equations and model statistics for full-time and part-time college enrollment rates of Asian/Pacific Islander women**

Independent variable	Coefficient	Standard error	t-statistic	R <sup>2</sup>	D.W. statistic
<b>Full-time</b>					
Intercept term for 17-year-olds	-13.81	0.622	-22.18	0.96	1.97*
Intercept term for 18-year-olds	-11.43	0.613	-18.66		
Intercept term for 19-year-olds	-10.83	0.618	-17.51		
Intercept term for 20-year-olds	-11.13	0.619	-17.98		
Intercept term for 21-year-olds	-11.24	0.615	-18.28		
Intercept term for 22-year-olds	-11.81	0.615	-19.21		
Intercept term for 23-year-olds	-12.20	0.614	-19.88		
Intercept term for 24-year-olds	-12.73	0.625	-20.37		
Intercept term for 25- to 29-year-olds	-13.61	0.611	-22.29		
Intercept term for 30- to 34-year-olds	-14.91	0.615	-24.22		
Intercept term for 35- to 44-year-olds	-15.40	0.617	-24.96		
Log of Asian/Pacific Islander per capita disposable income in current dollars	0.59	0.032	18.67		
<b>Part-time</b>					
Intercept term for 17-year-olds	-13.96	0.518	-26.94	0.86	1.95*
Intercept term for 18-year-olds	-12.15	0.510	-23.82		
Intercept term for 19-year-olds	-11.25	0.539	-20.88		
Intercept term for 20-year-olds	-11.66	0.523	-22.31		
Intercept term for 21-year-olds	-11.22	0.520	-21.59		
Intercept term for 22-year-olds	-11.47	0.500	-22.94		
Intercept term for 23-year-olds	-11.83	0.509	-23.25		
Intercept term for 24-year-olds	-12.05	0.526	-22.91		
Intercept term for 25- to 29-year-olds	-12.54	0.496	-25.30		
Intercept term for 30- to 34-year-olds	-13.22	0.498	-26.53		
Intercept term for 35- to 44-year-olds	-13.05	0.493	-26.49		
Log of Asian/Pacific Islander per capita disposable income in current dollars	0.53	0.025	20.88		

\*  $p < .05$ .

R<sup>2</sup> = Coefficient of determination.

D.W. statistic = Durbin-Watson statistic, a test for autocorrelation among regression residuals. For more details, see Johnston, J., and Dinardo, J. (1996). *Econometric Methods*. New York: McGraw-Hill.

NOTE: The regression method used to estimate the full-time and part-time equations was the pooled seemingly unrelated regression method. The time period used to estimate the equations is from 19890 to 2008. The number of observations is 220. For additional information, see Intriligator, M.D. (1978). *Econometric Models, Techniques, & Applications*. New Jersey: Prentice-Hall, Inc., pp. 165–173. Race categories exclude persons of Hispanic ethnicity.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Enrollment in Degree-Granting Institutions by Race/Ethnicity Model, 1980–2008. (This table was prepared January 2010.)

## A.6. POSTSECONDARY DEGREES CONFERRED

### Projections in this edition

This edition of *Projections of Education Statistics* presents projections of postsecondary degrees conferred by level of degree and sex of recipient for 2008–09 through 2019–20.

### Overview of approach

#### *Basic approach*

Projections of associate's, bachelor's, master's, and first-professional degrees for men and women were produced using forecasting equations that relate degrees conferred to full-time enrollment in degree-granting institutions by sex, student level (undergraduate or postbaccalaureate), and institution type (2-year or 4-year). Projections of doctor's degrees for men and women were produced using double exponential smoothing.

### Degrees Conferred Model

#### *Procedures used to project degrees*

For all degree levels, projections of degrees conferred were made separately for men and for women. The projections for men and women were then summed to get projections of the total number of degrees.

Double exponential smoothing was used to project doctor's degrees, as described below. Multiple linear regression was used to project associate's, bachelor's, master's, and first-professional degrees based on enrollment variables for men and women. The enrollment variables used for the different levels of degrees are briefly described below.

*For details and results of the regression analyses used to project associate's, bachelor's, master's, and first-professional degrees, see table A-28, under "Data and equations used to project degrees," later in this section.*

**Associate's degrees.** *Projections were based on full-time undergraduate enrollment in 2-year institutions by sex.* Men's projections of associate's degrees were based on current full-time enrollment and full-time enrollment lagged 2 years. Women's projections of associate's degrees were based on current full-time enrollment and full-time enrollment lagged 1 and 2 years.

**Bachelor's degrees.** *Projections were based on full-time undergraduate enrollment in 4-year institutions by sex.* For men and for women, bachelor's degree projections were based on current full-time enrollment and full-time enrollment lagged 2 years.

**Master's degrees.** *Projections were based on full-time postbaccalaureate enrollment by sex.* Men's projections of master's degrees were based on current full-time enrollment and full-time enrollment lagged 1 year. Women's projections of master's degrees were based on current full-time enrollment.

**Doctor's degrees.** *Projections were obtained by double exponential smoothing of the historical data on doctor's degrees awarded by sex.* A smoothing parameter of 0.4 was used.

**First-professional degrees.** *Projections were based on full-time postbaccalaureate enrollment by sex.* For men and for women, first-professional degree projections were based on current full-time enrollment and full-time enrollment lagged 1 and 2 years.

#### *Data and equations used to project degrees*

**Enrollment data and projections for degree-granting institutions.** Historical enrollment data by sex, level of student, and type of institution came from the NCES Integrated Postsecondary Education Data System (IPEDS). For the time period used for each level of degree, see table A-28 on page 138. The enrollment projections used are those produced for this edition of *Projections of Education Statistics*. For more information about the enrollment projections, see Section A.5. Enrollment in Postsecondary Degree-Granting Institutions, earlier in this appendix.

**Data on degrees awarded at all levels.** Historical data by level degree and sex of recipient came from the NCES Integrated Postsecondary Education Data System (IPEDS). Doctor's degrees were projected using data for 1960–61 to 2007–08. For the time periods used for the other degree levels, see table A-28 on page 138.

**Estimated equations and model statistics.** For details on the equations used to project associate's, bachelor's, master's, and first-professional degrees, see table A-28 on page 138. The equations shown were selected on the basis of their statistical properties, such as coefficients of determination ( $R^2$ s), the  $t$ -statistics of the coefficients, the Durbin-Watson statistic, the Breusch-Godfrey Serial Correlation LM test statistic, and residual plots.

### Accuracy of projections

No MAPEs were calculated for degrees conferred as the current model used for producing their projections has been used for only one other edition of the *Projections of Education Statistics*.

*For more information about MAPEs, see Section A.O. Introduction, earlier in this appendix.*

**Table A-28. Estimated equations and model statistics for degrees conferred, by degree type and sex**

Dependent variable	Equation <sup>1</sup>			R <sup>2</sup>	Breusch-Godfrey Serial Correlation LM test statistic <sup>2</sup>	Time period	
Associate's degrees, men	DASSOCM	= 1,758 + (2.3)	79DUGFT2M + (4.1)	58DUGFT2ML2 (3.3)	0.52	0.10 (0.951)	1980-81 to 2007-08
Associate's degrees, women	DLOGASSOCW	= # + (†)	0.7DLOGUGFT2WS3 + (3.8)	.5MA(1) (2.8)	0.59	0.07 (0.964)	1980-81 to 2007-08
Bachelor's degrees, men	DBACHM	= 640 + (0.6)	85DUGFT4M + (3.4)	140DUGFT4ML2 (5.7)	0.81	1.49 (0.475)	1980-81 to 2007-08
Bachelor's degrees, women	DBACHW	= 3620 + (1.6)	96DUGFT4W + (2.8)	103DUGFT4WL2 (3.0)	0.62	0.64 (0.726)	1980-81 to 2007-08
Master's degrees, men	PCHMASTM	= # + (†)	0.6PCHGFTM + (3.57)	0.6PCHGFTML1 + (4.26)	0.66	2.84 (0.241)	1970-71 to 2007-08
Master's degrees, women	PCHMASTW	= # + (†)	0.4PCHGFTW + (2.25)	0.6AR(1) (3.84)	0.60	1.03 (0.596)	1974-75 to 2007-08
First-professional degrees, men	DFPROM	= 101 + (0.6)	163DFPFTML1 + (5.1)	89DFPFTML2 (3.0)	0.61	3.34 (0.188)	1971-72 to 2007-08
First-professional degrees, women	DFPROW	= 136 + (0.7)	122DFPFTWL1 + (2.7)	153DFPFTWL2 (3.6)	0.51	2.75 (0.25)	1971-72 to 2007-08

# Rounds to zero.

† Not applicable.

<sup>1</sup> AR(1) indicates that the model included an AR(1) term for correcting for first-order autocorrelation. To estimate the model, it was first transformed into a nonlinear model and then the coefficients were estimated simultaneously by applying a Marquardt nonlinear least squares algorithm to the transformed equation. For a general discussion of the problem of autocorrelation and the method used to forecast in the presence of autocorrelation, see Judge, G., Hill, W., Griffiths, R., Lutkepohl, H., and Lee, T. *The Theory and Practice of Econometrics*, New York: John Wiley and Sons, 1985, pp. 315-318.

<sup>2</sup> Number in parentheses is Prob. Chi-Square(2) associated with the Breusch-Godfrey Serial Correlation LM Test. A p value greater than 0.05 implies that we do not reject the null hypothesis of no autocorrelation at the 5 or 10 percent significance levels. For an explanation of the Breusch-Godfrey Serial Correlation LM test statistic, see Greene, W. (2000). *Econometric Analysis*. New Jersey: Prentice-Hall.

NOTE: R<sup>2</sup> is the coefficient of determination. Numbers in parentheses are t-statistics. There are no equations for doctor's degrees for men and women as projections of those items were obtained using double exponential smoothing.

DASSOCM = First difference of associate's degrees awarded to men.

DLOGASSOCW = First difference of the log of associate's degrees awarded to women.

DBACHM = First difference of bachelor's degrees awarded to men.

DBACHW = First difference of bachelor's degrees awarded to women.

PCHMASTM = Percentage change in master's degrees awarded to men.

PCHMASTW = Percentage change in master's degrees awarded to women.

DFPROM = First difference of first-professional degrees awarded to men.

DFPROW = First difference of first-professional degrees awarded to women.

DUGFT2M = First difference of full-time male undergraduate enrollment in 2-year institutions.

DUGFT2ML2 = First difference of full-time male undergraduate enrollment in 2-year institutions, lagged two periods.

DLOGUGFT2WS3 = First difference of the sum of the full-time female undergraduate enrollment in 2-year institutions over the present year and the previous 2 years.

DUGFT4M = First difference of full-time male undergraduate enrollment in 4-year institutions.

DUGFT4ML2 = First difference of full-time male undergraduate enrollment in 4-year institutions, lagged two periods.

DUGFT4W = First difference of full-time female undergraduate enrollment in 4-year institutions.

DUGFT4WL2 = First difference of full-time female undergraduate enrollment in 4-year institutions, lagged two periods.

PCHGFTM = Percentage change in full-time male graduate enrollment.

PCHGFTML1 = Percentage change in full-time female graduate enrollment lagged one year.

PCHGFTW = Percentage change in full-time female graduate enrollment.

DFPFTML1 = First difference of full-time male first professional enrollment lagged one year.

DFPFTML2 = First difference of full-time male first professional enrollment lagged two years.

DFPFTWL1 = First difference of full-time female first professional enrollment lagged one year.

DFPFTWL2 = First difference of full-time female first professional enrollment lagged two years.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Degrees Conferred Model, 1970-71 through 2007-08. (This table was prepared February 2010.)



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# Appendix B

## *Supplementary Tables*

**Table B-1. Annual number of births: 1946 through 2008**

Calendar year	Number of births, in thousands	Calendar year	Number of births, in thousands
1946	3,426	1978	3,333
1947	3,834	1979	3,494
1948	3,655	1980	3,612
1949	3,667	1981	3,629
1950	3,645	1982	3,681
1951	3,845	1983	3,639
1952	3,933	1984	3,669
1953	3,989	1985	3,761
1954	4,102	1986	3,757
1955	4,128	1987	3,809
1956	4,244	1988	3,910
1957	4,332	1989	4,041
1958	4,279	1990	4,158
1959	4,313	1991	4,111
1960	4,307	1992	4,065
1961	4,317	1993	4,000
1962	4,213	1994	3,953
1963	4,142	1995	3,900
1964	4,070	1996	3,891
1965	3,801	1997	3,881
1966	3,642	1998	3,942
1967	3,555	1999	3,959
1968	3,535	2000	4,059
1969	3,626	2001	4,026
1970	3,739	2002	4,022
1971	3,556	2003	4,090
1972	3,258	2004	4,112
1973	3,137	2005	4,138
1974	3,160	2006	4,266
1975	3,144	2007	4,317
1976	3,168	2008	4,251
1977	3,327		

NOTE: Some data have been revised from previously published figures.

SOURCE: U.S. Department of Health and Human Services, National Center for Health Statistics (NCHS), *National Vital Statistics Reports*, various issues. (This table was prepared June 2010.)

**Table B-2. Actual and projected numbers for preprimary school-age populations: 1994 through 2019**

[In thousands]

Year (July 1)	3- to 5-year-olds	3-year-olds	4-year-olds	5-year-olds
<b>Actual</b>				
1994	12,001	4,023	4,066	3,912
1995	12,188	4,004	4,103	4,081
1996	12,141	3,936	4,086	4,119
1997	12,019	3,894	4,021	4,104
1998	11,880	3,862	3,979	4,040
1999	11,768	3,827	3,946	3,996
2000	11,699	3,824	3,905	3,971
2001	11,574	3,814	3,838	3,922
2002	11,503	3,820	3,828	3,854
2003	11,553	3,879	3,832	3,842
2004	11,781	4,047	3,890	3,845
2005	11,966	4,005	4,058	3,903
2006	12,140	4,052	4,017	4,072
2007	12,210	4,114	4,064	4,031
2008	12,323	4,122	4,124	4,076
<b>Projected</b>				
2009	12,447	4,179	4,132	4,136
2010	12,532	4,210	4,158	4,164
2011	12,625	4,246	4,189	4,190
2012	12,731	4,286	4,225	4,221
2013	12,850	4,328	4,264	4,257
2014	12,975	4,370	4,307	4,298
2015	13,100	4,411	4,349	4,340
2016	13,221	4,449	4,389	4,383
2017	13,334	4,484	4,427	4,424
2018	13,440	4,516	4,462	4,462
2019	13,537	4,546	4,494	4,497

NOTE: Some data have been revised from previously published figures. Detail may not sum to totals because of rounding. Projections are from the U.S. Census Bureau's middle series.

SOURCE: U.S. Department of Commerce, Census Bureau, Population Estimates, retrieved October 13, 2009, from <http://www.census.gov/popest/national/asrh/2008-nat-af.html>; and Population Projections, retrieved November 2, 2009, from <http://www.census.gov/population/www/projections/2008projections.html>. (This table was prepared January 2010.)

**Table B-3. Actual and projected numbers for school-age populations: 1994 through 2019**

[In thousands]

Year (July 1)	5-year-olds	6-year-olds	5- to 13-year-olds	14- to 17-year-olds
<b>Actual</b>				
1994	3,912	3,814	34,217	14,637
1995	4,081	3,919	34,825	15,013
1996	4,119	4,088	35,375	15,443
1997	4,104	4,127	35,915	15,769
1998	4,040	4,112	36,454	15,829
1999	3,996	4,045	36,804	16,007
2000	3,971	4,007	37,049	16,120
2001	3,922	3,988	37,071	16,180
2002	3,854	3,939	36,953	16,344
2003	3,842	3,869	36,725	16,484
2004	3,845	3,855	36,311	16,797
2005	3,903	3,859	36,026	17,051
2006	4,072	3,918	35,970	17,188
2007	4,031	4,087	35,940	17,189
2008	4,076	4,044	36,005	16,931
<b>Projected</b>				
2009	4,136	4,089	36,153	16,716
2010	4,164	4,136	36,433	16,570
2011	4,190	4,164	36,797	16,416
2012	4,221	4,191	37,195	16,326
2013	4,257	4,222	37,591	16,303
2014	4,298	4,258	37,989	16,347
2015	4,340	4,299	38,284	16,595
2016	4,383	4,342	38,622	16,843
2017	4,424	4,385	38,975	17,078
2018	4,462	4,426	39,321	17,321
2019	4,497	4,465	39,673	17,446

NOTE: Some data have been revised from previously published figures. Projections are from the U.S. Census Bureau's middle series.

SOURCE: U.S. Department of Commerce, Census Bureau, Population Estimates, retrieved October 13, 2009, from <http://www.census.gov/popest/national/asrh/2008-nat-af.html>; and Population Projections, retrieved November 2, 2009, from <http://www.census.gov/population/www/projections/2008projections.html>. (This table was prepared January 2010.)

**Table B-4. Actual and projected numbers for college-age populations: 1994 through 2019**

[In thousands]

Year (July 1)	18-year-olds	18- to 24-year-olds	25- to 29-year-olds	30- to 34-year-olds	35- to 44-year-olds
<b>Actual</b>					
1994	3,428	25,821	19,809	22,648	41,877
1995	3,601	25,585	19,742	22,425	42,765
1996	3,650	25,376	19,927	21,996	43,605
1997	3,780	25,574	19,960	21,494	44,282
1998	3,984	26,155	19,863	20,999	44,802
1999	3,993	26,780	19,632	20,647	45,130
2000	4,074	27,382	19,350	20,574	45,229
2001	4,069	28,034	18,969	20,757	45,163
2002	4,024	28,496	18,921	20,824	44,811
2003	4,119	28,949	19,100	20,707	44,395
2004	4,115	29,235	19,478	20,416	44,059
2005	4,112	29,301	19,963	20,011	43,802
2006	4,173	29,391	20,578	19,590	43,562
2007	4,254	29,572	21,054	19,505	43,166
2008	4,428	29,918	21,434	19,658	42,584
<b>Projected</b>					
2009	4,363	30,245	21,629	20,026	41,910
2010	4,311	30,588	21,715	20,511	41,471
2011	4,270	30,829	21,762	21,094	41,251
2012	4,212	31,003	21,860	21,566	41,218
2013	4,192	31,072	22,042	21,930	41,294
2014	4,171	31,023	22,337	22,143	41,402
2015	4,123	30,779	22,710	22,220	41,495
2016	4,127	30,536	23,044	22,274	41,724
2017	4,174	30,395	23,313	22,377	42,125
2018	4,221	30,342	23,455	22,564	42,684
2019	4,374	30,503	23,443	22,862	43,291

NOTE: Some data have been revised from previously published figures. Projections are from the U.S. Census Bureau's middle series.

SOURCE: U.S. Department of Commerce, Census Bureau, Population Estimates, retrieved October 13, 2009, from <http://www.census.gov/popest/national/asrh/2008-nat-af.html>; and Population Projections, retrieved November 2, 2009, from <http://www.census.gov/population/www/projections/2008projections.html>. (This table was prepared January 2010.)

**Table B-5. Actual and projected numbers for fall enrollment in public elementary and secondary schools, change in fall enrollment from previous year, resident population, and fall enrollment as a ratio of the population: School years 1994–95 through 2019–20**

School year	Fall enrollment (in thousands)	Change in fall enrollment from previous year (in thousands)	Resident population (in millions)	Fall enrollment as a ratio of the population
<b>Actual</b>				
1994–95	44,111	647	263.4	0.167
1995–96	44,840	729	266.6	0.168
1996–97	45,611	771	269.7	0.169
1997–98	46,127	516	272.9	0.169
1998–99	46,539	412	276.1	0.169
1999–2000	46,857	319	279.3	0.168
2000–01	47,204	346	282.4	0.167
2001–02	47,672	468	285.3	0.167
2002–03	48,183	511	288.0	0.167
2003–04	48,540	357	290.7	0.167
2004–05	48,795	255	293.3	0.166
2005–06	49,113	318	296.0	0.166
2006–07	49,316	203	298.8	0.165
2007–08	49,293	-23	301.7	0.163
<b>Projected</b>				
2008–09	49,265	-28	304.5	0.162
2009–10	49,312	47	307.2	0.161
2010–11	49,386	74	310.2	0.159
2011–12	49,554	167	313.2	0.158
2012–13	49,795	241	316.3	0.157
2013–14	50,088	293	319.3	0.157
2014–15	50,446	358	322.4	0.156
2015–16	50,827	381	325.6	0.156
2016–17	51,198	371	328.7	0.156
2017–18	51,583	385	331.8	0.155
2018–19	51,946	362	335.0	0.155
2019–20	52,342	396	338.2	0.155

NOTE: Resident population includes civilian population and armed forces personnel residing within the United States; it excludes armed forces personnel residing overseas. Calculations were made using unrounded numbers. Some data have been revised from previously published figures. Population projections are from the U.S. Census Bureau's middle series.

SOURCE: U.S. Department of Commerce, Census Bureau, Population Estimates, retrieved October 13, 2009, from <http://www.census.gov/popest/national/asrh/2008-nat-af.html>; and Population Projections, retrieved November 2, 2009, from <http://www.census.gov/population/www/projections/2008projections.html>. U.S. Department of Education, National Center for Education Statistics, Common Core of Data (CCD), "State Nonfiscal Survey of Public Elementary/Secondary Education," 1994–95 through 2007–08; and Elementary and Secondary Enrollment Model, 1972–2007. (This table was prepared March 2010.)

**Table B-6. Actual and projected numbers for macroeconomic measures of the economy: School years 1994–95 through 2019–20**

School year	Disposable income per capita in constant 2007–08 dollars <sup>1</sup>	Education revenue receipts from state sources per capita in constant 2007–08 dollars <sup>2</sup>	Consumer Price Index
<b>Actual</b>			
1994–95	\$26,806	\$682	0.710
1995–96	27,203	703	0.730
1996–97	27,810	723	0.751
1997–98	28,834	756	0.764
1998–99	29,812	789	0.778
1999–2000	30,618	827	0.800
2000–01	31,409	855	0.827
2001–02	32,140	860	0.842
2002–03	32,421	865	0.860
2003–04	33,314	851	0.879
2004–05	33,805	860	0.906
2005–06	34,311	870	0.940
2006–07	35,167	917	0.964
<b>Projected</b>			
2007–08 <sup>3</sup>	35,297	897	1.000
2008–09 <sup>3</sup>	35,019	885	1.014
2009–10	34,762	873	1.023
2010–11	34,877	872	1.038
2011–12	35,169	876	1.060
2012–13	35,719	888	1.080
2013–14	36,334	903	1.100
2014–15	37,282	927	1.121
2015–16	38,041	947	1.143
2016–17	38,789	966	1.165
2017–18	39,565	986	1.188
2018–19	40,457	1,009	1.210
2019–20	41,140	1,027	1.226

<sup>1</sup> Based on the price deflator for personal consumption expenditures, Bureau of Labor Statistics, U.S. Department of Labor.

<sup>2</sup> Based on the Consumer Price Index for all urban consumers, Bureau of Labor Statistics, U.S. Department of Labor.

<sup>3</sup> Disposable income per capita and consumer price index numbers are actual numbers.

NOTE: Calculations were made using unrounded numbers. Some data have been revised from previously published figures.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Common Core of Data (CCD), "National Public Education Financial Survey," 1994–95 through 2006–07; Revenue Receipts From State Sources Model, 1971–72 through 2006–07; and IHS Global Insight, "U.S. Monthly Model: November 2010 Short-Term-Projections." (This table was prepared January 2010.)

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# Appendix C

## Data Sources

### SOURCES AND COMPARABILITY OF DATA

The information in this report was obtained from many sources, including federal and state agencies, private research organizations, and professional associations. The data were collected by many methods, including surveys of a universe (such as all colleges) or of a sample, and compilations of administrative records. Care should be used when comparing data from different sources. Differences in procedures, such as timing, phrasing of questions, and interviewer training, mean that the results from the different sources are not strictly comparable. More extensive documentation of one survey's procedures than of another's does not imply more problems with the data, only that more information is available on the survey.

### ACCURACY OF DATA

The accuracy of any statistic is determined by the joint effects of “sampling” and “nonsampling” errors. Estimates based on a sample will differ from the figures that would have been obtained if a complete census had been taken using the same survey instruments, instructions, and procedures. Besides sampling errors, both of the surveys, universe and sample, are subject to errors of design, reporting, and processing, and errors due to nonresponse. To the extent possible, these nonsampling errors are kept to a minimum by methods built into the survey procedures. In general, however, the effects of nonsampling errors are more difficult to gauge than those produced by sampling variability.

### SAMPLING ERRORS

The standard error is the primary measure of the sampling variability of an estimate. Standard errors can be used to produce confidence intervals. For example, from table A-10, an estimated 91.8 percent of public school teachers reported that they worked full time in 2007–08. This figure has an estimated standard error of 0.29 percent. Therefore, the estimated 95 percent confidence interval for this statistic is approximately 92.41 to 91.27 percent ( $91.8 \pm 1.96 (0.29)$ ). That is, if the processes of selecting a sample, collecting the data, and constructing the confidence interval were repeated, it would be expected that in 95 out of 100 samples from the same population, the confidence interval would contain the true full time working rate.

Analysis of standard errors can help assess how valid a comparison between two estimates might be. The *standard error of a difference* between two independent sample estimates is equal to the square root of the sum of the squared standard errors of the estimates. The standard error ( $se$ ) of the difference between independent sample estimates  $a$  and  $b$  is

$$se_{a-b} = (se_a^2 + se_b^2)^{1/2}$$

Note that most of the standard errors in the original documents are approximations. That is, to derive estimates of standard errors that would be applicable to a wide variety of items and could be prepared at a moderate cost, a number of approximations were required. As a result, most of the standard errors presented provide a general order of magnitude rather than the exact standard error for any specific item.

### NONSAMPLING ERRORS

Both universe and sample surveys are subject to nonsampling errors. Nonsampling errors are of two kinds—random and nonrandom. Random nonsampling errors may arise when respondents or interviewers interpret questions differently, when respondents must estimate values, or when coders, keyers, and other processors handle answers differently. Nonrandom nonsampling errors result from total nonresponse (no usable data obtained for a sampled unit), partial or item nonresponse (only a portion of a response may be usable), inability or unwillingness on the part of respondents to provide information, difficulty interpreting questions, mistakes in recording or keying data, errors of collection or processing, and overcoverage

or undercoverage of the target universe. Random nonresponse errors usually, but not always, result in an understatement of sampling errors and thus an overstatement of the precision of survey estimates. Because estimating the magnitude of nonsampling errors would require special experiments or access to independent data, these magnitudes are seldom available.

To compensate for suspected nonrandom errors, adjustments of the sample estimates are often made. For example, adjustments are frequently made for nonresponse, both total and partial. Imputations are usually made separately within various groups of sample members that have similar survey characteristics. Imputation for item nonresponse is usually made by substituting for a missing item the response to that item of a respondent having characteristics similar to those of the respondent.

Although the magnitude of nonsampling errors in the data used in *Projections of Education Statistics* is frequently unknown, idiosyncrasies that have been identified are noted on the appropriate tables.

## FEDERAL AGENCY SOURCES

### National Center for Education Statistics (NCES)

#### *Common Core of Data*

NCES uses the Common Core of Data (CCD) to acquire and maintain statistical data from each of the 50 states, the District of Columbia, the Bureau of Indian Education, Department of Defense Dependents' Schools (overseas), and the outlying areas (American Samoa, Guam, Northern Marianas, Puerto Rico, and U.S. Virgin Islands). Information about staff and students is collected annually at the school, local education agency (LEA) or school district, and state levels. Information about revenues and expenditures is also collected at the state and LEA levels.

Data are collected for a particular school year via an on-line reporting system open to state education agencies during the school year. Beginning with the 2006–07 school year, nonfiscal CCD data are collected through the Department of Education's Education Data Exchange Network (EDEN). Since the CCD is a universe collection, CCD data are not subject to sampling errors. However, nonsampling errors could come from two sources: nonresponse and inaccurate reporting. Almost all of the states submit the five CCD survey instruments each year, but submissions are sometimes incomplete.

Misreporting can occur when 58 education agencies compile and submit data for approximately 97,000 public schools and over 17,000 local education agencies. Typically, this results from varying interpretations of NCES definitions and differing record-keeping systems. NCES attempts to minimize these errors by working closely with the state education agencies through the National Forum on Education Statistics.

The state education agencies report data to NCES from data collected and edited in their regular reporting cycles. NCES encourages the agencies to incorporate into their own survey systems the NCES items they do not already collect so that these items will also be available for the subsequent CCD survey. Over time, this has meant fewer missing data cells in each state's response, reducing the need to impute data.

NCES subjects data from the state education agencies to a comprehensive edit. Where data are determined to be inconsistent, missing, or out of range, NCES contacts the agencies for verification. NCES-prepared state summary forms are returned to the agencies for verification. Each year, states are also given an opportunity to revise their state-level aggregates from the previous survey cycle.

Further information on the nonfiscal CCD may be obtained from

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<http://nces.ed.gov/ccd/>

Further information on the fiscal CCD data may be obtained from

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*Private School Universe Survey*

The purposes of Private School Universe Survey (PSS) data collection activities are to build an accurate and complete list of private schools to serve as a sampling frame for NCES sample surveys of private schools, and to report data on the total number of private schools, teachers, and students in the survey universe. The PSS is conducted every 2 years, with collections in the 1989–90, 1991–92, 1993–94, 1995–96, 1997–98, 1999–2000, 2001–02, 2003–04, 2005–06, and 2007–08 school years.

The PSS produces data similar to that of the CCD for public schools and can be used for public-private comparisons. The data are useful for a variety of policy and research-relevant issues, such as the growth of religiously affiliated schools, the number of private high school graduates, the length of the school year for various private schools, and the number of private school students and teachers.

The target population for this universe survey is all private schools in the United States that meet the NCES criteria of a school (i.e., a private school is an institution that provides instruction for any of grades K through 12, has one or more teachers to give instruction, is not administered by a public agency, and is not operated in a private home). The survey universe is composed of schools identified from a variety of sources. The main source is a list frame, initially developed for the 1989–90 PSS. The list is updated regularly, matching it with lists provided by nationwide private school associations, state departments of education, and other national guides and sources that list private schools. The other source is an area frame search in approximately 124 geographic areas, conducted by the U.S. Census Bureau.

Further information on the PSS may be obtained from

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<http://nces.ed.gov/surveys/pss/>

*Integrated Postsecondary Education Data System*

The Integrated Postsecondary Education Data System (IPEDS) surveys approximately 6,700 postsecondary institutions, including universities and colleges, as well as institutions offering technical and vocational education beyond the high school level. IPEDS, which began in 1986, replaced the Higher Education General Information Survey (HEGIS).

IPEDS consists of nine integrated components that obtain information on who provides postsecondary education (institutions), who participates in it and completes it (students), what programs are offered and what programs are completed, and both the human and financial resources involved in the provision of institutionally-based postsecondary education. Until 2000 these components included: institutional characteristics, fall enrollment, completions, salaries, finance, and fall staff. Since 2000, data are collected in the fall for institutional characteristics and completions; in the winter for employees by assigned position (EAP), salaries, and fall staff; and in the spring for enrollment, student financial aid, finances, and graduation rates. With the winter 2005–06 survey the employees by assigned position, fall staff, and salaries components were merged into the human resources component. In 2007–08, the enrollment component was broken into two separate components: 12-month enrollment (collected in the fall) and fall enrollment (collected in the spring). The Graduation rates 200 percent survey is new to the Spring 2010 collection. Data are collected for the number of students who completed their program within 200 percent of the normal time period. This survey was developed to fulfill requirements in the Higher Education Opportunity Act of 2008.

The degree-granting institutions portion of IPEDS is a census of colleges awarding associate's or higher degrees, that are eligible to participate in Title IV financial aid programs. Prior to 1993, data from technical and vocational institutions were collected through a sample survey. Beginning in 1993, all data were gathered in a census of all postsecondary institutions. The IPEDS tabulations developed for this edition of *Projections of Education Statistics* are based on lists of all institutions and are not subject to sampling errors.

The definition of institutions generally thought of as offering college and university education has changed in recent years. The old standard for higher education institutions included those institutions that had courses leading to an associate degree or higher, or that had courses accepted for credit toward those degrees. The higher education institutions were accredited by an agency or association that was recognized by the U.S. Department of Education, or were recognized directly by the Secretary of Education. The current category includes institutions that award associate or higher level degrees and that are eligible to participate in Title IV federal financial aid programs. The impact of this change has generally not been large. For example, tables on degrees awarded at the bachelor's level or higher were not heavily affected. Most of the data on public 4-year colleges have been affected only to a minimal extent. The impact on enrollment in public 2-year colleges was noticeable in certain states, but relatively small at the national level. The largest impact has been on private 2-year college enrollment. Overall, total enrollment for all institutions was about one-half of a percent higher for degree-granting institutions than for higher education institutions.

Prior to the establishment of IPEDS in 1986, HEGIS acquired and maintained statistical data on the characteristics and operations of institutions of higher education. Implemented in 1966, HEGIS was an annual universe survey of institutions accredited at the college level by an agency recognized by the Secretary of the U.S. Department of Education. These institutions were listed in the NCES publication *Education Directory, Colleges and Universities*.

HEGIS surveys collected information concerning institutional characteristics, faculty salaries, finances, enrollment, and degrees. Since these surveys were distributed to all higher education institutions, the data presented are not subject to sampling error. However, they are subject to nonsampling error, the sources of which varied with the survey instrument. Information concerning the nonsampling error of the HEGIS enrollment and degrees surveys can be obtained from the HEGIS Post Survey Validation Study conducted in 1979.

Further information may be obtained from

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<http://nces.ed.gov/ipeds/>

*Fall (Institutional Characteristics)* This survey collects the basic information necessary to classify institutions, including control, level, and types of programs offered, as well as information on tuition, fees, and room and board charges. Beginning in 2000, the survey collected institutional pricing data from institutions with first-time, full-time, degree/certificate-seeking undergraduate students. Unduplicated full-year enrollment headcounts and instructional activity are now collected in a separate component (12-month Enrollment), part of the fall collection. The overall response rate was almost 100 percent for Title IV degree-granting institutions in reporting fall 2008 data.

Further information may be obtained from

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*Spring (Fall Enrollment)* This survey has been part of the HEGIS and IPEDS series since 1966. Response rates for this survey have been relatively high, generally exceeding 85 percent. Beginning in 2000, with web-based data collection, higher response

rates were attained. For fall 2008, the overall response rate was 99.9 percent for degree-granting institutions. The response rate for 4-year private not-for-profit institutions was 99.9 percent, it was 99.8 percent for 4-year public, and 4-year private-for-profit, 2-year public, 2-year private not-for-profit, and 2-year private for-profit institutions had response rates of 100.0 percent. Imputation methods and the response bias analysis for the 2007–08 survey are discussed in Knapp, Kelly-Reid, and Ginder (2010).

Public institutions made the majority of changes to enrollment data during the 2004 revision period (Jackson et al. 2005). The majority of changes were made to unduplicated headcount data, with the net differences between the original data and the revised data at about 1 percent. Part-time students in general and enrollment in private not-for-profit institutions were often underestimated. The fewest changes by institutions were to Classification of Instructional Programs (CIP) code data.

Further information about the Spring (Fall Enrollment) survey may be obtained from

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*Fall (Completions)* This survey was part of the HEGIS series throughout its existence. Collection of degree data has been maintained through IPEDS. However, the degree classification taxonomy was revised in 1970–71, 1982–83, 1991–92, and 2002–03.

The nonresponse rate does not appear to be a significant source of nonsampling error for this survey. The response rate over the years has been high, with the overall response rate for 2008 at 100 percent for degree-granting institutions. The response rate for 4-year private not-for-profit institutions was 99.9 percent and 100 percent for all others. Because of the high response rate for degree-granting institutions, nonsampling error caused by imputation is also minimal. Imputation methods and the response bias analysis for the fall 2008 survey are discussed in Knapp, Kelly-Reid, and Ginder (2009).

Most Title IV institutions supplying revised data on completions in 2003–04 were able to supply missing data for the prior year (Jackson et al. 2005). The size of the differences between imputed data for the prior year and the revised actual data supplied by the institution indicated that the imputed values produced by NCES were acceptable.

Further information on the IPEDS Completions surveys may be obtained from

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## Census Bureau

### *Current Population Survey*

Prior to July 2001, estimates of school enrollment rates, as well as social and economic characteristics of students, were based on data collected in the Census Bureau's monthly household survey of about 50,000 dwelling units. Beginning in July 2001, this sample was expanded to 60,000 dwelling units. The monthly Current Population Survey (CPS) sample consists of 754 areas comprising 2,007 geographic areas, independent cities, and minor civil divisions throughout the 50 states and the District of Columbia. The samples are initially selected based on the decennial census files and are periodically updated to reflect new housing construction.

The monthly CPS deals primarily with labor force data for the civilian noninstitutional population (i.e., excluding military personnel and their families living on post and inmates of institutions). In addition, in October of each year, supplemental questions are asked about highest grade completed, level and grade of current enrollment, attendance status, number and type of courses, degree or certificate objective, and type of organization offering instruction for each member of the

household. In March of each year, supplemental questions on income are asked. The responses to these questions are combined with answers to two questions on educational attainment: highest grade of school ever attended and whether that grade was completed.

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

Caution should also be used when comparing data between Census years. With the release of the January 2003 CPS data, population controls that reflect the results of Census 2000 were used in the monthly CPS estimation process. The new controls increased the size of the civilian noninstitutional population by about 3.5 million in May 2002. This adjustment usually occurs 3 to 4 years after the census, and, if the adjustment is substantial, historical data will be revised. Data from January 2000 through December 2002 were revised to reflect these new controls. Over and above these revisions, the U.S. Census Bureau introduced another large upward adjustment to the controls as part of its annual update of population estimates for 2003. The prior change in population controls occurred in March 1993, where data after this date were based on the 1990 census-based population controls and data before this date were based on 1980 or earlier census based population controls. This change in population controls between 1980-based and 1990-based had relatively little impact on summary measures, such as means, medians, and percentage distributions. It does, however, have a significant impact on levels. For example, use of 1990-based population controls resulted in about a 1 percent increase in the civilian noninstitutional population and in the number of families and households. Thus, estimates of levels for data collected in 1994 and later years differed from those for earlier years by more than what could be attributed to actual changes in the population. These differences could be disproportionately greater for certain subpopulation groups than for the total population.

In addition to the changes in population controls, two other relevant changes were introduced into the CPS with the release of the January 2003 data. First, the questions on race and Hispanic origin in the CPS were modified to comply with the new standards for maintaining, collecting, and presenting Federal data on race and ethnicity for Federal statistical agencies. A major change under those standards is that respondents may select more than one race when answering the survey. Respondents continued to be asked a separate question to determine if they are Hispanic, which is considered an ethnicity rather than a race. The ethnicity question was reworded to ask directly whether the respondent was Hispanic. Persons who report they are Hispanic also are classified separately in the race (or races) they consider themselves to be. Second, improvements were introduced to both the second stage and composite weighting procedures. These changes adapt the weighting procedures to the new race/ethnic classification system and enhance the stability over time of national and state/substate labor force estimates for demographic groups. These two changes, in addition to the change in population controls discussed above, benchmark the CPS data to the results of Census 2000, improve the estimation procedures, and ensure that the data series produced from the survey reflect the evolving composition of the U.S. population.

Further information on CPS may be obtained from

Education and Social Stratification Branch  
Population Division  
Census Bureau  
U.S. Department of Commerce  
Washington, DC 20233  
<http://www.census.gov/cps>

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

The October 2007 basic CPS household-level response rate was 92.0 percent and the school enrollment supplement person-level response rate was 94.1 percent. Since these rates are determined at different levels they cannot be combined to derive an overall response rate.

Further information on CPS methodology may be obtained from

<http://www.census.gov/cps>

Further information on CPS “School Enrollment” may be obtained from

Education and Social Stratification Branch

Census Bureau

U.S. Department of Commerce

Washington, DC 20233

<http://www.census.gov/population/www/socdemo/school.html>

*National Population Projections* The 2008 National Population Projections provide projections of resident population and demographic components of change (births, deaths, and net international migration) through 2050. Population projections are available by age, sex, race and Hispanic origin. The following is a general description of the methods used to produce the 2008 National Population Projections.

The projections originated with a base population from Census 2000 and were produced using a cohort-component method. Many of the characteristics of the U.S. resident population, as measured by Census 2000, were preserved as demographic patterns that worked their way through the projection period. Using the cohort-component method, the components of population change (births, deaths, and net international migration) were projected for each birth cohort (persons born in a given year). For each passing year, the population was advanced one year of age. The new age categories were updated using survival rates and levels of net international migration projected for the passing year. A new birth cohort was added to form the population under one year of age by applying projected age-specific fertility rates to the female population aged 15 to 49, and updating the new cohort for the effects of mortality and net international migration.

The assumptions for the components of change were based on time series analysis. Initially, demographic models were used to summarize historical trends. The forecast parameters obtained from these models were utilized in the models’ framework to create fertility, mortality, and migration schedules required for the cohort-component method. Because of limited data about racial characteristics in the fertility and mortality historical series, the assumptions were first developed for three mutually exclusive and exhaustive groups: Hispanic origin (any race), non-Hispanic Black alone, and non-Hispanic all other races. These assumptions were then applied to their respective detailed race/ethnic categories to project the population, allowing presentation of the race categories described above.

Further information on the National Population Projections may be obtained from

Population Division

Census Bureau

U.S. Department of Commerce

Washington, DC 20233

<http://www.census.gov>

*State Population Projections* These state population projections were prepared using a cohort-component method by which each component of population change—births, deaths, state-to-state migration flows, international in-migration, and international out-migration—was projected separately for each birth cohort by sex, race, and Hispanic origin. The basic framework was the same as in past Census Bureau projections.

Detailed components necessary to create the projections were obtained from vital statistics, administrative records, census data, and national projections.

The cohort-component method is based on the traditional demographic accounting system:

$$P_t = P_o + B - D + DIM - DOM + IIM - IOM$$

where:

$P_1$	=	population at the end of the period
$P_0$	=	population at the beginning of the period
$B$	=	births during the period
$D$	=	deaths during the period
$DIM$	=	domestic in-migration during the period
$DOM$	=	domestic out-migration during the period
$IIM$	=	international in-migration during the period
$IOM$	=	international out-migration during the period

To generate population projections with this model, the Census Bureau created separate datasets for each of these components. In general, the assumptions concerning the future levels of fertility, mortality, and international migration are consistent with the assumptions developed for the national population projections of the Census Bureau.

Once the data for each component were developed, it was a relatively straightforward process to apply the cohort-component method and produce the projections. For each projection year, the base population for each state was disaggregated into eight race and Hispanic categories (non-Hispanic White; non-Hispanic Black; non-Hispanic American Indian, Eskimo, and Aleut; non-Hispanic Asian and Pacific Islander; Hispanic White; Hispanic Black; Hispanic American Indian, Eskimo, and Aleut; and Hispanic Asian and Pacific Islander), by sex, and single year of age (ages 0 to 85+). The next step was to survive each age-sex-race-ethnic group forward 1 year using the pertinent survival rate. The internal redistribution of the population was accomplished by applying the appropriate state-to-state migration rates to the survived population in each state. The projected out-migrants were subtracted from the state of origin and added to the state of destination (as in-migrants). Next, the appropriate number of immigrants from abroad was added to each group. The population under age 1 was created by applying the appropriate age-race-ethnic-specific birth rates to females of childbearing age (ages 15 to 49). The number of births by sex and race/ethnicity were survived forward and exposed to the appropriate migration rate to yield the population under age 1. The final results of the projection process were proportionally adjusted to be consistent with the national population projections by single years of age, sex, race, and Hispanic origin. The entire process was then repeated for each year of the projection.

More information on Census Bureau projections may be obtained from

Population Division  
Census Bureau  
U.S. Department of Commerce  
Washington, DC 20233  
<http://www.census.gov>

## OTHER SOURCES

### IHS Global Insight

IHS Global Insight provides an information system that includes databases of economic and financial information; simulation and planning models; regular publications and special studies; data retrieval and management systems; and access to experts on economic, financial, industrial, and market activities. One service is the IHS Global Insight Model of the U.S. Economy, which contains annual projections of U.S. economic and financial conditions, including forecasts for the federal government, incomes, population, prices and wages, and state and local governments, over a long-term (10- to 25-year) forecast period.

Additional information is available from

IHS Global Insight  
1000 Winter Street  
Suite 4300N  
Waltham, MA 02451-124  
<http://www.ihsglobalinsight.com/>



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# Appendix D

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# Appendix E

## *List of Abbreviations*

<b>ADA</b>	average daily attendance
<b>BLS</b>	Bureau of Labor Statistics
<b>CCD</b>	Common Core of Data
<b>CIP</b>	Classification of Instructional Programs
<b>CPI</b>	Consumer Price Index
<b>CPS</b>	Current Population Survey
<b>EAP</b>	employees by assigned position
<b>EDEN</b>	education data exchange network
<b>EDMOD</b>	Education Forecasting Model
<b>FTE</b>	full-time-equivalent
<b>HEGIS</b>	Higher Education General Information Survey
<b>IPEDS</b>	Integrated Postsecondary Education Data System
<b>LEA</b>	local education agency
<b>MAPE</b>	mean absolute percentage error
<b>NCES</b>	National Center for Education Statistics
<b>NCHS</b>	National Center for Health Statistics

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# Appendix F

## Glossary

**American Indian or Alaska Native:** A person having origins in any of the original peoples of North America and who maintains cultural identification through tribal affiliation or community recognition.

**Asian/Pacific Islander:** A person having origins in any of the original peoples of the Far East, Southeast Asia, the Indian Subcontinent, and Pacific Islands. This includes people from China, Japan, Korea, the Philippine Islands, American Samoa, India, and Vietnam.

**Associate's degree:** An award that normally requires at least 2 but less than 4 years of full-time equivalent college work.

**Autocorrelation:** Correlation of the error terms from different observations of the same variable. Also called *serial correlation*.

**Average daily attendance (ADA):** The aggregate attendance of a school during a reporting period (normally a school year) divided by the number of days school is in session during this period. Only days on which the pupils are under the guidance and direction of teachers should be considered days in session.

**Average daily membership (ADM):** The aggregate membership of a school during a reporting period (normally a school year) divided by the number of days school is in session during this period. Only days on which the pupils are under the guidance and direction of teachers should be considered as days in session. The ADM for groups of schools having varying lengths of terms is the average of the ADMs obtained for the individual schools.

**Bachelor's degree:** An award (baccalaureate or equivalent degree, as determined by the Secretary, U.S. Department of Education) that normally requires at least 4 but not more than 5 years of full-time equivalent college-level work. This includes all bachelor's degrees conferred in a 5-year cooperative (work-study) program. A cooperative plan provides for alternate class attendance and employment in business, industry, or government; thus, it allows students to combine actual work experience with their college studies. Also includes bachelor's degrees in which the normal 4 years of work are completed in 3 years.

**Black:** A person having origins in any of the black racial groups of Africa (except those of Hispanic origin).

**Breusch-Godfrey serial correlation LM test:** A statistic testing the independence of errors in least-squares regression against alternatives of first-order and higher degrees of serial

correlation. The test belongs to a class of asymptotic tests known as the Lagrange multiplier (LM) tests.

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

**Cohort:** A group of individuals that have a statistical factor in common (e.g., year of birth).

**Cohort-component method:** A method for estimating and projecting a population is distinguished by its ability to preserve knowledge of an age distribution of a population (which may be of a single sex, race, and Hispanic origin) over time.

**College:** A postsecondary school that offers a general or liberal arts education, usually leading to an associate's, bachelor's, master's, doctor's, or first-professional degree. Junior colleges and community colleges are included in this term.

**Constant dollars:** Dollar amounts that have been adjusted by means of price and cost indexes to eliminate inflationary factors and allow direct comparison across years.

**Consumer Price Index (CPI):** This price index measures the average change in the cost of a fixed-market basket of goods and services purchased by consumers.

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

**Current expenditures (elementary/secondary):** The expenditures for operating local public schools and school districts, excluding capital outlay, interest on school debt, and programs outside of public elementary and secondary education. These expenditures include such items as salaries for school personnel, fixed charges, student transportation, school books and materials, and energy costs.

**Current expenditures per pupil in average daily attendance (ADA):** Current expenditures for the regular school term divided by the ADA of full-time pupils (or full-time-equivalency of pupils) during the term. See also *Current expenditures* and *Average daily attendance*.

**Current Population Survey:** See appendix C, Data Sources.

**Degree-granting institutions:** Postsecondary institutions that are eligible for Title IV federal financial aid programs and

that grant an associate's or higher degree. For an institution to be eligible to participate in Title IV financial aid programs it must offer a program of at least 300 clock hours in length, have accreditation recognized by the U.S. Department of Education, have been in business for at least 2 years, and have signed a participation agreement with the Department.

**Degrees of freedom:** The number of free or linearly independent sample observations used in the calculation of a statistic. In a time series regression with  $t$  time periods and  $k$  independent variables including a constant term, there would be  $t$  minus  $k$  degrees of freedom.

**Dependent variable:** A mathematical variable whose value is determined by that of one or more other variables in a function. In regression analysis, when a random variable,  $y$ , is expressed as a function of variables  $x_1, x_2, \dots$ , plus a stochastic term, then  $y$  is known as the "dependent variable."

**Disposable income:** Current income received by persons less their contributions for social insurance, personal tax, and nontax payments. It is the income available to persons for spending and saving. Nontax payments include passport fees, fines and penalties, donations, and tuitions and fees paid to schools and hospitals operated mainly by the government. See also *Personal income*.

**Doctor's degree:** The highest award a student can earn for graduate study. The doctor's degree classification includes such degrees as Doctor of Education, Doctor of Juridical Science, Doctor of Public Health, and the Doctor of Philosophy degree in any field such as agronomy, food technology, education, engineering, public administration, ophthalmology, or radiology.

**Double exponential smoothing:** A method that takes a single smoothed average component of demand and smoothes it a second time to allow for estimation of a trend effect.

**Durbin-Watson statistic:** A statistic testing the independence of errors in least squares regression against the alternative of first-order serial correlation. The statistic is a simple linear transformation of the first-order serial correlation of residuals and, although its distribution is unknown, it is tested by bounding statistics that follow R. L. Anderson's distribution.

**Econometrics:** The quantitative examination of economic trends and relationships using statistical techniques, and the development, examination, and refinement of those techniques.

**Elementary and secondary schools:** As used in this publication, includes only regular schools, that is, schools that are part of state and local school systems and also most private elementary and secondary schools, both religiously affiliated and nonsectarian. Schools not included in this term are subcollegiate departments of institutions of higher education, federal schools for Indians, and federal schools on military posts and other federal installations.

**Elementary school:** A school classified as elementary by state and local practice and composed of any span of grades not above grade 8. A preschool or kindergarten school is included under this heading only if it is an integral part of an elementary school or a regularly established school system.

**Enrollment:** The number of students registered in a given school unit at a given time, generally in the fall of a year.

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

**Estimating equation:** An equation involving observed quantities and an unknown that serves to estimate the latter.

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

**Expenditures:** Charges incurred, whether paid or unpaid, that are presumed to benefit the current fiscal year. For elementary and secondary schools, these include all charges for current outlays plus capital outlays and interest on school debt. For degree-granting institutions, these include current outlays plus capital outlays. For government, these include charges net of recoveries and other correcting transactions other than for retirement of debt, investment in securities, or extension of credit. Government expenditures include only external transactions, such as the provision of perquisites or other payments in kind. Aggregates for groups of governments exclude intergovernmental transactions.

**Expenditures per pupil:** Charges incurred for a particular period of time divided by a student unit of measure, such as average daily attendance or average daily membership.

**Exponential smoothing:** A method used in time series analysis to smooth or to predict a series. There are various forms, but all are based on the supposition that more remote history has less importance than more recent history.

**First-order serial correlation:** When errors in one time period are correlated directly with errors in the ensuing time period. Also called *autocorrelation*.

**First-professional degree:** An award that requires completion of a program that meets all of the following criteria: (1) completion of the academic requirements to begin practice in the profession; (2) at least 2 years of college work prior to entering the program; and (3) a total of at least 6 academic years of college work to complete the degree program, including prior required college work plus the length of the professional program itself. First-professional degrees may be awarded in the following 10 fields: Chiropractic (D.C. or

D.C.M.), Dentistry (D.D.S. or D.M.D.), Law (L.L.B., J.D.), Medicine (M.D.), Optometry (O.D.), Osteopathic Medicine (D.O.), Pharmacy (Pharm.D.), Podiatry (D.P.M., D.P., or Pod.D.), Theology (M.Div., M.H.L., B.D., or Ordination), Veterinary Medicine (D.V.M.).

**First-professional enrollment:** The number of students enrolled in following degree programs: Chiropractic (D.C. or D.C.M.), Dentistry (D.D.S. or D.M.D.), Law (L.L.B., J.D.), Medicine (M.D.), Optometry (O.D.), Osteopathic Medicine (D.O.), Pharmacy (Pharm.D.), Podiatry (D.P.M., D.P., or Pod.D.), Theology (M.Div., M.H.L., B.D., or Ordination), Veterinary Medicine (D.V.M.).

**First-time freshman:** A student attending any institution for the first time at the undergraduate level. Includes students enrolled in academic or occupational programs. Also includes students enrolled in the fall term who attended college for the first time in the prior summer term, as well as students who entered with advanced standing (college credits earned before graduation from high school).

**Forecast:** An estimate of the future based on rational study and analysis of available pertinent data, as opposed to subjective prediction.

**Forecasting:** Assessing the magnitude that a quantity will assume at some future point in time, as distinct from “estimation,” which attempts to assess the magnitude of an already existent quantity.

**Four-year institution:** A postsecondary institution that offers programs of at least 4 years duration or one that offers programs at or above the baccalaureate level. Includes schools that offer postbaccalaureate certificates only or those that offer graduate programs only. Also includes free-standing medical, law or other first-professional schools.

**Full-time-equivalent (FTE) enrollment:** A measurement equal to one student enrolled full time for one academic year. Total FTE enrollment includes full time plus the calculated equivalent of the part-time enrollment. The full-time equivalent of the part-time students can be estimated using different factors depending on the type and control of institution and level of student.

**Full-time worker:** In educational institutions, an employee whose position requires being on the job on school days throughout the school year at least the number of hours the schools are in session; for higher education, a member of an educational institution’s staff who is employed full time.

**Function:** A mathematical correspondence that assigns exactly one element of one set to each element of the same or another set. A variable that depends on and varies with another.

**Functional form:** A mathematical statement of the relationship among the variables in a model.

**Graduate:** An individual who has received formal recognition for the successful completion of a prescribed program of studies.

**Graduate enrollment:** The number of students who hold the bachelor’s or first-professional degree, or the equivalent, and who are working towards a master’s or doctor’s degree. First-professional students are counted separately. These enrollment data measure those students who are registered at a particular time during the fall.

**Higher education:** Study beyond secondary school at an institution that offers programs terminating in an associate’s, baccalaureate, or higher degree.

**Higher education institutions (traditional classifications):**

**4-year institution:** An institution legally authorized to offer and offering at least a 4-year program of college-level studies wholly or principally creditable toward a bachelor’s degree. A university is a postsecondary institution that typically includes one or more graduate professional schools.

**2-year institution:** An institution legally authorized to offer and offering at least a 2-year program of college-level studies that terminates in an associate’s degree or is principally creditable toward a baccalaureate.

See also *Degree-granting institutions* and *Postsecondary education*.

**High school:** A secondary school offering the final years of high school work necessary for graduation, usually including grades 10, 11, and 12 (in a 6-3-3 plan) or grades 9, 10, 11, and 12 (in a 6-2-4 plan).

**Hispanic:** A person of Mexican, Puerto Rican, Cuban, Central or South American or other Spanish culture or origin, regardless of race.

**Independent variable:** In regression analysis, a random variable,  $y$ , is expressed as a function of variables  $x_1, x_2, \dots$ , plus a stochastic term; the  $x$ ’s are known as “independent variables.”

**Interpolation:** See *Linear interpolation*.

**Lag:** An event occurring at time  $t + k$  ( $k > 0$ ) is said to lag behind an event occurring at time  $t$ , the extent of the lag being  $k$ . An event occurring  $k$  time periods before another may be regarded as having a negative lag.

**Linear interpolation:** A method that allows the prediction of an unknown value if any two particular values on the same scale are known and the rate of change is assumed constant.

**Master’s degree:** An award that requires the successful completion of a program of study of at least the full-time equivalent of 1 but not more than 2 academic years of work beyond the bachelor’s degree.

**Mean absolute percentage error (MAPE):** The average value of the absolute value of errors expressed in percentage terms.

**Model:** A system of postulates, data, and inferences presented as a mathematical description of a phenomenon, such as an actual system or process. The actual phenomenon is represented by the model in order to explain, predict, and control it.

**Nonresident alien:** A person who is not a citizen or national of the United States and who is in this country on a visa or temporary basis and does not have the right to remain indefinitely.

**Ordinary least squares (OLS):** The estimator that minimizes the sum of squared residuals.

**Parameter:** A quantity that describes a statistical population.

**Part-time enrollment:** Undergraduate—A student enrolled for either 11 semester credits or less, or 11 quarter credits or less, or less than 24 contact hours a week each term. Graduate—A student enrolled for either 8 semester credits or less, or 8 quarter credits or less.

**Personal income:** Current income received by persons from all sources minus their personal contributions for social insurance. Classified as “persons” are individuals (including owners of unincorporated firms), nonprofit institutions serving individuals, private trust funds, and private noninsured welfare funds. Personal income includes transfers (payments not resulting from current production) from government and business such as social security benefits, military pensions, and so forth, but excludes transfers among persons.

**Postbaccalaureate enrollment:** The number of students with a bachelor’s degree who are enrolled in graduate-level or first-professional courses.

**Postsecondary education:** The provision of a formal instructional program whose curriculum is designed primarily for students who are beyond the compulsory age for high school. This includes programs whose purpose is academic, vocational, and continuing professional education, and excludes avocational and adult basic education programs.

**Postsecondary education institution:** An institution which has as its sole purpose or one of its primary missions, the provision of postsecondary education.

**Private institution:** A school or institution that is controlled by an individual or agency other than a state, a subdivision of a state, or the federal government (i.e., usually supported primarily by other than public funds) and the operation of whose program rests with other than publicly elected or appointed officials.

**Projection:** In relation to a time series, an estimate of future values based on a current trend.

**Property tax:** The sum of money collected from a tax levied against the value of property.

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

**Pupil/teacher ratio:** The enrollment of pupils at a given period of time, divided by the full-time-equivalent number of classroom teachers serving these pupils during the same period.

**R<sup>2</sup>:** The coefficient of determination; the square of the correlation coefficient between the dependent variable and its OLS estimate.

**Race/ethnicity:** Categories used to describe groups to which individuals belong, identify with, or belong in the eyes of the community. The categories do not denote scientific definitions of anthropological origins. A person may be counted in only one group. The groups used to categorize U.S. citizens, resident aliens, and other eligible non-citizens in this report are as follows: Black, American Indian/Alaska Native, Asian/Pacific Islander, Hispanic, White.

**Region:** The four geographical regions of the United States as defined by the Census Bureau of the U.S. Department of Commerce presented below:

**Northeast:** Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, and Vermont.

**Midwest:** Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, and Wisconsin.

**South:** Alabama, Arkansas, Delaware, District of Columbia, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, and West Virginia.

**West:** Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming.

**Regression analysis:** A statistical technique for investigating and modeling the relationship between variables.

**Revenue receipts:** Additions to assets that do not incur an obligation that must be met at some future date and do not represent exchanges of property for money. Assets must be available for expenditures.

**Revenues:** All funds received from external sources, net of refunds and correcting transactions. Noncash transactions such as receipt of services, commodities, or other receipts “in kind” are excluded, as are funds received from the issuance of debt, liquidation of investments, or nonroutine sale of property.



**Rho:** A measure of the correlation coefficient between errors in time period  $t$  and time period  $t$  minus 1.

**Salary:** The total amount regularly paid or stipulated to be paid to an individual, before deductions, for personal services rendered while on the payroll of a business or organization.

**School:** A division of the school system consisting of students in one or more grades or other identifiable groups and organized to give instruction of a defined type. One school may share a building with another school or one school may be housed in several buildings.

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

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

**Senior high school:** A secondary school offering the final years of high school work necessary for graduation.

**Serial correlation:** Correlation of the error terms from different observations of the same variable. Also called *autocorrelation*.

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

**Student:** An individual for whom instruction is provided in an educational program under the jurisdiction of a school, school system, or other educational institution. No distinction is made between the terms “student” and “pupil,” although “student” may refer to one receiving instruction at any level while “pupil” refers only to one attending school at the elementary or secondary level. The term “student” is used

to include individuals at all instructional levels. A student may receive instruction in a school facility or in another location, such as at home or in a hospital. Instruction may be provided by direct student-teacher interaction or by some other approved medium, such as the Internet, television, radio, telephone, or correspondence.

**Tax base:** The collective value of sales, assets, and income components against which a tax is levied.

**Time series:** A set of ordered observations on a quantitative characteristic of an individual or collective phenomenon taken at different points in time. Usually the observations are successive and equally spaced in time.

**Time series analysis:** The branch of quantitative forecasting in which data for one variable are examined for patterns of trend, seasonality, and cycle.

**Two-year institution:** A postsecondary institution that offers programs of at least 2 but less than 4 years duration. Includes occupational and vocational schools with programs of at least 1800 hours and academic institutions with programs of less than 4 years. Does not include bachelor’s degree-granting institutions where the baccalaureate program can be completed in 3 years.

**Undergraduate enrollment:** The number of students enrolled in a 4- or 5-year bachelor’s degree program, an associate’s degree program, or a vocational or technical program below the baccalaureate.

**Undergraduate students:** Students registered at an institution of higher education who are working in a program leading to a baccalaureate or other formal award below the baccalaureate, such as an associate’s degree.

**Ungraded student (elementary/secondary):** A student who has been assigned to a school or program that does not have standard grade designations.

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

**White:** A person having origins in any of the original peoples of Europe, North Africa, or the Middle East (except those of Hispanic origin).





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