High School Longitudinal Study of 2009 (HSLS:09)

2013 Update and High School Transcript Study: A First Look at Fall 2009 Ninth-Graders in 2013

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2013 Update and High School Transcript Study: A First Look at Fall 2009 Ninth-Graders in 2013

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Acknowledgments

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Contents

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List of Figures

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List of Tables

Introduction

Focus of This Report

This report provides a first look at selected findings from 1) the 2013 Update and 2) the High School Transcript Study of the High School Longitudinal Study of 2009 (HSLS:09). HSLS:09 is a nationally representative study of a cohort of students who were ninth-graders in fall 2009. The study focuses on understanding students' trajectories from the beginning of high school into higher education and the workforce. The core research questions for the study explore secondary to postsecondary transition plans and the evolution of those plans; the paths into and out of science, technology, engineering, and mathematics (STEM) fields of study and careers; and the educational and social experiences related to these shifts in plans or paths.

The 2013 Update and the High School Transcript Study allow researchers to begin analyses of high school outcomes and immediate postsecondary plans and experiences, bolstered by the rich data gathered in prior rounds. Students were first surveyed in fall 2009 as ninth-graders and were surveyed again 2.5 years later, in 2012, when most were spring-term eleventh-graders. In the summer and fall of 2013, students or their parents responded to a survey about the student's high school completion status, postsecondary education and work plans, college application experiences, and work experiences. In addition, school personnel in base-year schools and other schools identified during data collection supplied high school transcripts for HSLS:09 students from all schools that these students had attended. These transcripts were reviewed for completeness, courses were coded into a uniform set of codes, and information on credits and grades was standardized. Therefore, this report examines an array of critical measures: high school completion, plans for postsecondary education or work in fall 2013 (the academic year after most students have graduated from high school), and coursetaking patterns both overall and in STEM fields specifically. The findings are presented for all study respondents (including those who graduated early or did not complete high school as of 2013) as well as for subgroups of students by sex, race/ethnicity, socioeconomic status, and other characteristics.

Because this report is descriptive in nature, readers are cautioned not to draw causal inferences based on the presented results. It is important to note that many of the variables examined in this report may be related to one another, and complex interactions and relationships among the variables have not been explored. The variables examined here are also just a small number of those that can be examined in these data; they were selected to demonstrate the range of information available from the studies. These findings are examples of estimates that can be obtained from the data and are not designed to fully

explore any particular issue. The release of this report is intended to encourage more in-depth analysis of the data using more sophisticated statistical methods.

Comparisons made in the text were tested for statistical significance to ensure that the differences were larger than might be expected as a result of sampling variation. All differences reported are significant at the $p < .05$ level. There were no adjustments for multiple comparisons. National estimates (averages and percentages) reported in the text that are summed across reported categories are based on the underlying unrounded estimates. The findings highlighted in the bullets do not report all statistically significant differences among estimates.

Further information about the dataset and the methodologies employed in collecting and processing the data can be found in the technical appendix to this report (appendix A) and, with greater detail, in the HSLS:09 2013 Update and High School Transcript Data File Documentation (DFD) (Ingels et al. 2015), available at http://nces.ed.gov/surveys/hsls09/.

Study Design

HSLS:09 is a longitudinal study of a nationally representative sample of approximately 20,000 ninth-graders. More specifically, the study is based on fall-term ninth-graders in 944 schools with a ninth and an eleventh grade in fall 2009. The sampled schools encompass both public schools, including charter schools, and private schools providing instruction in the 50 United States and the District of Columbia. More information about the sample design, including classification of ineligible cases, can be found in the Technical Notes and Methodology section (appendix A). A first follow-up of HSLS:09 occurred in spring 2012, when most sample members were in the eleventh grade. A second follow-up is planned for 2016, when most sample members will be 3 years beyond high school graduation. The number and timing of future follow-ups beyond 2016 is yet to be determined, although the expectation is that the cohort will be followed at least to age 30, with a questionnaire administration and a postsecondary education transcript collection in 2025–26.

The 2013 Update (survey) occurred in summer and fall 2013, when most sample members had already graduated from high school. Either sample members or their parents could have completed the questionnaire; question wording was adapted so that parents were responding about their children's activities and plans. Although the goal of the survey was to gather objective information about students, analysts should be sensitive to the fact that, for a subset of items, certain subjective responses may differ between parents and their children. In addition, because the survey was administered over a period that both preceded and overlapped with the traditional start of college classes in the fall, a number of questions were designed to elicit the anticipated or realized activities of respondents on November 1, 2013. The tables and figures in this report indicate when the data gathered correspond to November 1 activities or activities at the time of the interview itself.

In 2013 and 2014, high school transcripts were gathered from all high schools that students had attended—including schools known from prior rounds, schools identified by the student or parent during the 2013 update survey, or schools discovered during the request for transcripts from known schools. Coursetaking records from transcripts were keyed and coded using the School Courses for the Exchange of Data (SCED), a common classification system that places courses into standard 12-character codes reflecting their course content and subject matter (National Forum on Education Statistics 2014).[1] HSLS:09's use of SCED marks the first implementation of this code frame on any NCES transcript study. Course credits, course grades, and other measures drawn from transcripts were standardized to ensure comparability across schools. A file identifying course offerings at base-year schools was also created.

Although primarily student data are reported here, the HSLS:09 dataset includes important contextual data from other sources, including the school administrators, school counselors, science teachers, mathematics teachers, and parents of the students (findings in the current report include data provided by parents in earlier study waves). Contextual data were gathered from each of these sources in the base year and from school administrators, school counselors, and parents in the first follow-up.

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[1] Examples of SCED five-digit subject codes and course titles can be found in tables A-5 and A-6 of this report.

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Selected Findings

High School Transcript Study

- Approximately 89 percent of fall 2009 ninth-graders had earned a high school diploma by 2013. Another 3 percent had earned a General Educational Development (GED) credential or other high school equivalency (figure 1 and table 1).

- On average, fall 2009 ninth-graders had earned 25 high school credits by 2013, with a grade point average (GPA) of 2.7 (table 2).[2]

- On average, fall 2009 ninth-graders had earned 3.6 credits in math and 3.3 credits in science by 2013. On average, students had earned 7.6 credits in STEM[3] courses (table 3).

- About 15 percent of all fall 2009 ninth-graders had earned at least some high school credit in calculus by 2013; about 9 percent of students had reached only algebra I or less (1 percent had earned no math credit, 2 percent had earned credit in below-algebra I courses only, and 5 percent had earned credit in algebra I courses only) (table 4).

- The average credits accrued overall and in advanced mathematics and science courses varied among the states in HSLS:09's 10 state-representative samples. Five states—Florida, North Carolina, Pennsylvania, Tennessee, and Texas—had total average credits greater than the national (public school) average of 25 (table 5).

- A higher percentage of fall 2009 ninth-graders who scored in the highest fifth on the HSLS:09 mathematics assessment in 2012 had earned high school credit in an Advanced Placement (AP) or International Baccalaureate (IB) science course by 2013 than either students in the middle three-fifths or the lowest fifth (38 percent versus 9 percent and 2 percent, respectively) (table 6).

- A higher percentage of males than females had earned any high school credit in engineering and technology by 2013 (21 percent versus 8 percent) (table 7).

- About 37 percent of fall 2009 ninth-graders had earned high school credit in an AP or IB course by 2013, with the average credit earned among those with some credit being about 3. Fifteen percent had earned AP or IB credit in math, and 14 percent had earned such credit in science (table 8).

- About 10 percent of fall 2009 ninth-graders had earned high school dual-enrollment credit by 2013 (table 9).

2013 Update

- Thirty-six percent of fall 2009 ninth-graders planned to take or were taking postsecondary classes without working on November 1, 2013. Another 22 percent planned to work or were working but were not taking postsecondary classes, and 23 percent were undecided about their plans (figure 2 and table 10).

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[2] Unless otherwise noted, all tables include ninth-graders who subsequently dropped out or did not obtain a high school credential by 2013.

[3] Includes mathematics, science, computer and information sciences, and engineering and technology courses.

- Seventy-three percent of high school completers were taking postsecondary classes, and 8 percent had been accepted or registered for classes, but not started, by November 1, 2013. An additional 16 percent had not applied to nor registered at a postsecondary institution, and 3 percent had applied but had not been accepted (figure 3).

- Among fall 2009 ninth-graders who were attending or planned to attend a postsecondary institution in 2013, approximately 42 percent enrolled in or planned to enroll in a bachelor's degree program and 34 percent in an associate's degree program (table 11).

- Among respondents who were taking or planning to take postsecondary classes on November 1, 2013, and who identified a major in which they were interested, 23 percent identified a science, technology, engineering, or math (STEM) major. A higher percentage of male students (33 percent) than female students (14 percent) identified a STEM major, and this difference held regardless of the level of the postsecondary program in which they were taking classes (table 12).

- Fifty-one percent of fall 2009 ninth-graders were working full time in 2013, and another 14 percent were working part time. Those who were working averaged 27 hours of work per week, and earned about $9.10 per hour ($1.85 higher than the minimum wage of $7.25 per hour in 2013) (table 13).

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Figures and Tables

Figure 1.
High school completion status of fall 2009 ninth-graders: 2013
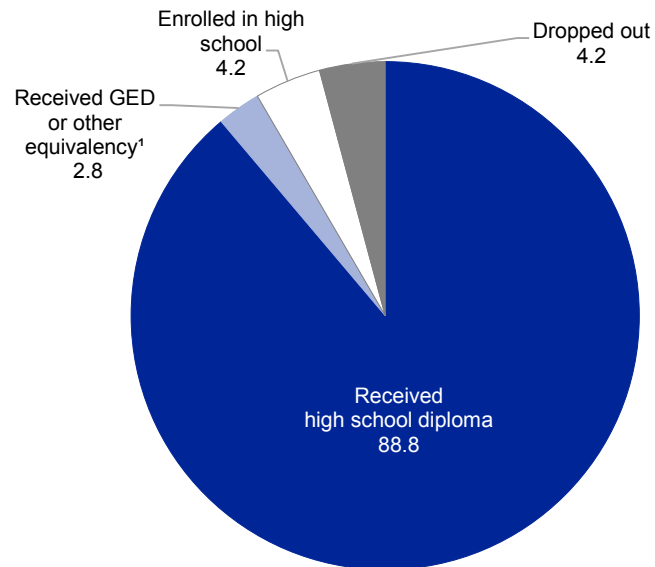
[1] Includes certificate of attendance. GED refers to General Educational Development, an alternative path to attaining a high school credential.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSLS:09), High School Transcript Public-Use File.

Table 1.
High school completion status of fall 2009 ninth-graders, by student and family characteristics: 2013

Characteristic	Received high school diploma	Received GED or other equivalency[1]	Enrolled in high school	Dropped out
Total	**88.8**	**2.8**	**4.2**	**4.2**
Sex				
Female	90.7	2.5	3.5	3.3
Male	87.0	3.0	4.9	5.0
Race/ethnicity				
Asian, non-Hispanic	95.9	1.3	0.6	2.2
Black, non-Hispanic	83.2	4.5	5.4	6.9
Hispanic or Latino	86.0	2.4	5.6	6.0
White, non-Hispanic	91.6	2.5	3.3	2.7
More than one race, non-Hispanic	87.8	3.2	5.4	3.6
All other races, non-Hispanic	73.5	3.8	10.7	12.0
Socioeconomic status quintile				
Lowest quintile	80.9	4.4	7.4	7.4
Middle three quintiles	88.9	2.8	4.2	4.1
Highest quintile	96.7	1.1	1.2	1.0

[1] Includes certificate of attendance. GED refers to General Educational Development, an alternative path to attaining a high school credential.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSLS:09), First Follow-up and High School Transcript Public-Use File.

Table 2.

Average high school credits earned and grade point average (GPA) of fall 2009 ninth-graders, by course type and student, family, and school characteristics: 2013

Characteristic	Credits				GPA	
	Total	Academic	CTE	Other	Total	Academic
Total	**24.8**	**18.3**	**3.0**	**3.5**	**2.7**	**2.5**
Sex						
Female	25.3	19.1	2.8	3.4	2.8	2.7
Male	24.3	17.5	3.1	3.7	2.6	2.4
Race/ethnicity						
Asian, non-Hispanic	26.0	20.3	2.2	3.4	3.1	3.0
Black, non-Hispanic	23.8	17.4	2.9	3.5	2.3	2.1
Hispanic or Latino	23.9	17.6	2.6	3.6	2.5	2.3
White, non-Hispanic	25.4	18.7	3.2	3.5	2.9	2.7
More than one race, non-Hispanic	24.5	18.0	2.9	3.5	2.6	2.4
All other races, non-Hispanic	23.2	17.1	2.6	3.6	2.5	2.3
Socioeconomic status quintile						
Lowest fifth	23.1	16.6	3.1	3.5	2.3	2.2
Middle three fifths	24.8	18.1	3.1	3.5	2.7	2.5
Highest fifth	26.5	20.4	2.4	3.6	3.2	3.1
Parent's highest education						
Less than high school	22.1	15.9	2.6	3.5	2.3	2.1
High school	24.0	17.3	3.2	3.5	2.5	2.4
Associate's degree	24.8	18.1	3.2	3.5	2.6	2.4
Bachelor's degree	25.7	19.4	2.8	3.5	2.9	2.8
Master's degree or higher	26.3	20.3	2.4	3.6	3.1	3.0
Mathematics achievement quintile (2012)						
Lowest fifth	21.8	15.1	3.2	3.5	2.1	1.9
Middle three fifths	24.9	18.2	3.1	3.6	2.6	2.5
Highest fifth	26.8	21.1	2.4	3.4	3.4	3.3
School sector						
Public, 2009 and 2012	24.6	18.1	3.1	3.4	2.7	2.5
Private, 2009 and 2012	27.5	20.9	1.4	5.2	3.2	3.1
Changed sectors, 2009 to 2012	23.3	17.9	2.0	3.5	2.9	2.9

NOTE: Estimates include ninth-graders who dropped out or did not obtain a high school credential by 2013. Academic courses refer to those in English, mathematics, science, social sciences, fine arts, and foreign language. CTE refers to career and technical education. Other refers to physical education, religion, and military studies.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSLS:09), First Follow-up and High School Transcript Study Public-Use File.

Table 3.

Average high school credits earned by fall 2009 ninth-graders, by academic subject area, student, family, and school characteristics: 2013

Characteristic	STEM areas					Non-STEM academic areas				
	STEM total	Math	Science	Computer and information sciences	Engineer-ing and technology	Non-STEM total	English	Social Studies	Foreign Language	Fine arts
Total	**7.6**	**3.6**	**3.3**	**0.5**	**0.2**	**11.4**	**4.0**	**3.6**	**1.8**	**1.9**
Sex										
Female	7.6	3.7	3.4	0.4	0.1	12.0	4.1	3.7	2.0	2.2
Male	7.6	3.6	3.2	0.5	0.3	10.7	4.0	3.6	1.7	1.5
Race/ethnicity										
Asian, non-Hispanic	8.5	3.9	3.9	0.5	0.1	12.4	4.2	3.9	2.4	1.8
Black, non-Hispanic	7.4	3.6	3.1	0.5	0.1	10.7	4.2	3.4	1.6	1.5
Hispanic or Latino	7.2	3.5	3.1	0.5	0.1	11.0	4.1	3.5	1.8	1.6
White, non-Hispanic	7.8	3.7	3.4	0.5	0.2	11.6	4.0	3.7	1.9	2.0
More than one race, non-Hispanic	7.4	3.5	3.3	0.5	0.2	11.2	4.0	3.6	1.8	1.9
All other races, non-Hispanic	6.9	3.6	3.0	0.3	0.1	10.5	4.1	3.2	1.5	1.7
Socioeconomic status quintile										
Lowest fifth	7.0	3.4	2.9	0.5	0.1	10.3	4.0	3.3	1.4	1.5
Middle three fifths	7.6	3.6	3.3	0.5	0.2	11.3	4.0	3.6	1.8	1.8
Highest fifth	8.3	3.9	3.7	0.5	0.2	12.8	4.1	4.0	2.5	2.3
Parent's highest education										
Less than high school	6.5	3.2	2.8	0.4	0.1	9.9	3.9	3.1	1.4	1.5
High school	7.3	3.5	3.1	0.5	0.2	10.7	4.0	3.5	1.6	1.7
Associate's degree	7.6	3.7	3.2	0.5	0.2	11.3	4.1	3.6	1.7	1.8
Bachelor's degree	8.0	3.8	3.5	0.5	0.2	12.1	4.1	3.8	2.2	2.1
Master's degree or higher	8.2	3.9	3.7	0.5	0.2	12.7	4.1	3.9	2.4	2.3
Mathematics achievement quintile (2012)										
Lowest fifth	6.4	3.2	2.7	0.4	0.2	9.3	3.9	3.1	1.0	1.4
Middle three fifths	7.5	3.6	3.3	0.5	0.2	11.4	4.1	3.6	1.8	1.9
Highest fifth	8.7	4.1	3.9	0.5	0.3	13.1	4.1	4.1	2.7	2.3
School sector										
Public, 2009 and 2012	7.6	3.6	3.3	0.5	0.2	11.2	4.0	3.6	1.8	1.8
Private, 2009 and 2012	8.1	3.9	3.7	0.4	0.1	13.2	4.3	3.9	2.8	2.2
Changed sectors, 2009 to 2012	7.2	3.5	3.2	0.5	0.1	11.2	3.8	3.6	2.3	1.5

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSLS:09), First Follow-up and High School Transcript Study Public-Use File.

Table 4.

Percentage of fall 2009 ninth-graders by highest mathematics course in which high school credit was earned, student, family, school characteristics, and ninth-grade mathematics course: 2013

Characteristic	No math	Below algebra I[1]	Algebra I	Geometry	Algebra II	Other math[2]	Precalculus	Calculus
Total	**1.4**	**2.2**	**5.0**	**10.6**	**22.6**	**24.0**	**19.2**	**14.9**
Sex								
Female	1.3	1.8	3.9	8.8	23.6	25.2	20.7	14.8
Male	1.5	2.6	6.0	12.4	21.7	22.9	17.8	15.1
Race/ethnicity								
Asian, non-Hispanic	0.6	0.2	1.5	3.9	10.7	16.5	21.7	44.8
Black, non-Hispanic	3.2	3.8	6.3	9.3	23.7	32.2	15.8	5.7
Hispanic or Latino	1.2	1.6	6.2	16.9	23.7	23.4	16.9	10.0
White, non-Hispanic	1.0	2.1	4.2	8.6	21.7	22.6	21.7	18.2
More than one race, non-Hispanic	1.5	2.2	6.1	11.1	27.1	25.2	16.0	10.8
All other races, non-Hispanic	4.5	4.9	4.7	11.4	38.9	17.5	8.9	9.2
Socioeconomic status quintile								
Lowest fifth	2.2	3.7	8.7	15.8	26.0	23.9	13.5	6.2
Middle three fifths	1.4	2.1	5.0	10.8	24.9	24.9	18.3	12.5
Highest fifth	0.5	1.0	1.0	4.5	12.2	21.5	28.0	31.3
Parent's highest education								
Less than high school	2.3	3.9	12.3	18.7	21.9	19.8	12.7	8.3
High school	1.9	3.2	6.2	13.2	27.3	25.0	14.9	8.3
Associate's degree	1.8	1.9	5.2	10.8	26.2	24.9	19.3	9.9
Bachelor's degree	0.6	1.0	2.3	8.0	17.6	24.6	23.9	22.0
Master's degree or higher	0.6	1.1	2.2	4.0	14.1	21.6	25.5	31.0
Mathematics achievement quintile (2012)								
Lowest fifth	5.0	6.3	12.6	17.7	28.1	23.6	5.8	0.9
Middle three fifths	0.8	1.7	4.3	11.7	26.6	27.5	20.4	7.0
Highest fifth	0.0		0.4	1.6	7.2	15.0	27.5	48.2
School sector								
Public, 2009 and 2012	1.5	2.3	5.2	11.2	23.5	24.1	18.4	13.8
Private, 2009 and 2012	0.3	0.5	1.1	2.1	10.8	21.9	32.0	31.3
Changed sectors, 2009 to 2012	0.5	1.9	5.7	9.0	18.3	31.7	18.7	14.1
Ninth-grade math course								
Below algebra I	8.8	14.6	13.0	20.3	25.0	13.2	3.5	1.6
Algebra I	#	#	5.8	11.7	32.0	26.5	20.0	4.1
Geometry or above	#	#	#	4.4	8.4	25.7	25.5	36.0

\# Rounds to zero.

[1] Includes basic math, applied math, other math such as history of math and mathematics–test preparation, and pre-algebra.

[2] Includes integrated math, trigonometry, algebra III, probability and statistics, and non-calculus Advanced Placement (AP) or International Baccalaureate (IB) courses.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSLS:09), First Follow-up and High School Transcript Study Public-Use File.

Table 5.
Average total high school credits earned and percentage earning any advanced mathematics or science credit for fall 2009 ninth-graders (public school students only), in the nation and in states with state-representative data: 2013

State	Average total credits	Percent earning precalculus or calculus credit	Percent earning AP or IB science credit[1]
National, public schools only	**24.8**	**32.8**	**13.8**
California	22.2	29.0	15.0
Florida	25.9	26.7	14.2
Georgia	25.0	23.1	13.5
Michigan	22.9	36.3	14.2
North Carolina	26.4	33.3	17.5
Ohio	22.4	33.2	11.6
Pennsylvania	26.5	35.3	13.8
Tennessee	26.9	25.3	6.7
Texas	26.6	50.0	19.5
Washington	22.6	33.8	21.2

[1] Includes Advanced Placement (AP) or International Baccalaureate (IB) courses (except IB Middle Years Program courses; see appendix A, section A.11.2, for more information).

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSLS:09), First Follow-up and High School Transcript Study Restricted-Use File.

Table 6.

Percentage of fall 2009 ninth-graders by highest science course in which high school credit was earned, student, family, school characteristics, and ninth-grade science course: 2013

Characteristic	No science	General science[1]	Specialty science[2]	Advanced studies[3]	AP or IB science[4]
Total	**2.1**	**44.6**	**34.6**	**4.8**	**13.9**
Sex					
Female	1.8	40.8	37.1	5.3	15.0
Male	2.4	48.3	32.1	4.4	12.8
Race/ethnicity					
Asian, non-Hispanic	0.9	28.4	24.2	6.6	40.0
Black, non-Hispanic	3.1	49.1	37.1	2.9	7.8
Hispanic or Latino	2.9	50.0	33.8	3.2	10.2
White, non-Hispanic	1.5	42.0	34.5	6.2	15.7
More than one race, non-Hispanic	2.5	45.7	36.0	3.4	12.4
All other races, non-Hispanic	3.5	46.9	43.1	0.9	5.6
Socioeconomic status quintile					
Lowest fifth	3.7	53.0	33.8	3.3	6.3
Middle three fifths	2.1	45.5	36.2	4.7	11.5
Highest fifth	0.6	33.2	30.3	6.9	28.9
Parent's highest education					
Less than high school	5.3	48.2	35.4	3.7	7.3
High school	2.8	50.9	34.4	3.9	7.9
Associate's degree	2.1	46.4	37.8	4.3	9.4
Bachelor's degree	1.0	37.8	34.5	6.6	20.1
Master's degree or higher	0.6	35.1	29.7	5.7	29.0
Mathematics achievement quintile (2012)					
Lowest fifth	5.8	55.7	35.0	1.7	1.7
Middle three fifths	1.7	46.7	37.7	5.2	8.7
Highest fifth	0.2	29.4	25.6	6.5	38.2
School sector					
Public, 2009 and 2012	2.3	45.0	34.4	4.8	13.5
Private, 2009 and 2012	0.0	37.4	38.0	4.7	19.8
Changed sectors, 2009 to 2012	1.3	50.8	30.6	4.2	13.1
Ninth-grade science course					
Physical science or basic biology	22.3	49.7	21.9	1.4	4.7
Biology	#	46.4	35.1	4.0	14.6
Chemistry, physics, or advanced biology	#	#	58.7	19.2	22.1

Rounds to zero.

[1] Includes earth science; general life or physical science; first-year biology, chemistry, and physics; integrated and unified science; and general science courses such as origins of science and scientific research and design.

[2] Includes courses such as geology, botany, zoology, and independent studies in biology, chemistry, or physics.

[3] Includes advanced studies in biology, chemistry, and physics.

[4] Includes Advanced Placement (AP) or International Baccalaureate (IB) courses (except IB Middle Years Program courses; see appendix A, section A.11.2, for more information).

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSLS:09), First Follow-up and High School Transcript Study Public-Use File.

Table 7.

Average high school credits earned in technology-related courses, and percentage earning any credit, for fall 2009 ninth-graders, by student, family, and school characteristics: 2013

Characteristic	Computer and information sciences		Engineering and technology	
	Average credits	Earned any credit	Average credits	Earned any credit
Total	**1.0**	**47.1**	**1.3**	**14.7**
Sex				
Female	1.0	45.1	1.0	8.3
Male	1.1	49.0	1.4	21.1
Race/ethnicity				
Asian, non-Hispanic	1.2	38.1	1.1	11.5
Black, non-Hispanic	1.1	47.8	1.4	10.8
Hispanic or Latino	1.0	46.7	1.1	12.0
White, non-Hispanic	1.0	48.3	1.3	17.3
More than one race, non-Hispanic	1.0	44.8	1.2	14.5
All other races, non-Hispanic	0.9	33.3	1.0	8.7
Socioeconomic status quintile				
Lowest fifth	1.0	47.4	1.2	12.1
Middle three fifths	1.1	47.3	1.3	15.5
Highest fifth	1.0	45.9	1.3	15.1
Parent's highest education				
Less than high school	1.0	40.6	0.9	9.5
High school	1.1	48.5	1.2	14.4
Associate's degree	1.0	48.5	1.3	15.5
Bachelor's degree	1.0	46.6	1.4	16.1
Master's degree or higher	1.0	45.6	1.3	14.8
Mathematics achievement quintile (2012)				
Lowest fifth	1.0	43.8	1.3	12.1
Middle three fifths	1.0	48.6	1.2	14.5
Highest fifth	1.1	45.7	1.4	17.5
School sector				
Public, 2009 and 2012	1.1	46.6	1.3	15.3
Private, 2009 and 2012	0.8	52.6	0.8	7.6
Changed sectors, 2009 to 2012	0.9	49.9	1.0	9.5

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSLS:09), First Follow-up and High School Transcript Study Public-Use File.

Table 8.

Average high school credits earned and percentage of fall 2009 ninth-graders earning any credit in Advanced Placement (AP) and International Baccalaureate (IB) courses, by student, family, and school characteristics: 2013

Characteristic	Math		Science		Total AP/IB credits[1]	
	Average AP/IB credit earned	Percent earning any AP/IB credit	Average AP/IB credit earned	Percent earning any AP/IB credit	Average AP/IB credit earned	Percent earning any AP/IB credit
Total	**1.2**	**14.8**	**1.3**	**13.9**	**3.2**	**36.7**
Sex						
Female	1.2	15.3	1.3	15.0	3.2	41.5
Male	1.3	14.3	1.4	12.8	3.3	32.0
Race/ethnicity						
Asian, non-Hispanic	1.4	45.5	1.7	40.0	4.5	72.3
Black, non-Hispanic	1.1	6.4	1.1	7.8	2.7	23.1
Hispanic or Latino	1.1	11.8	1.3	10.1	3.2	33.6
White, non-Hispanic	1.2	16.7	1.3	15.7	3.1	39.8
More than one race, non-Hispanic	1.2	12.4	1.3	12.3	3.2	34.1
All other races, non-Hispanic	1.3	11.7	1.7	5.6	3.5	24.1
Socioeconomic status quintile						
Lowest fifth	1.1	6.6	1.3	6.2	2.6	22.5
Middle three fifths	1.2	12.6	1.3	11.5	3.0	33.2
Highest fifth	1.3	30.0	1.4	28.9	3.8	62.0
Parent's highest education						
Less than high school	1.2	7.5	1.3	7.3	2.9	22.3
High school	1.2	8.6	1.2	7.9	2.7	26.4
Associate's degree	1.2	10.6	1.3	9.4	2.7	30.2
Bachelor's degree	1.2	21.5	1.4	20.1	3.4	48.9
Master's degree or higher	1.3	29.4	1.4	28.9	4.0	59.6
Mathematics achievement quintile (2012)						
Lowest fifth	1.1	0.6	1.2	1.7	1.7	10.0
Middle three fifths	1.1	8.1	1.2	8.7	2.5	31.3
Highest fifth	1.3	45.0	1.5	38.2	4.2	74.0
School sector						
Public, 2009 and 2012	1.2	14.3	1.3	13.5	3.2	35.4
Private, 2009 and 2012	1.1	23.0	1.4	19.8	3.1	53.2
Changed sectors, 2009 to 2012	1.0	10.9	1.3	13.1	2.8	47.3

[1] Includes all subjects (not only math and science).
NOTE: IB Middle Years Program courses are not included; see appendix A, section A.11.2, for more information.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSLS:09), First Follow-up and High School Transcript Study Public-Use File.

Table 9.

Percentage of fall 2009 ninth-graders earning high school credit in dual-enrollment courses, by student, family, and school characteristics: 2013

Characteristic	Any dual-enrollment credit	Dual enrollment in math, science, and other subjects		
		Dual-enrollment math credit	Dual-enrollment science credit	Dual-enrollment credit in all other subjects[1]
Total	**9.6**	**3.1**	**1.9**	**8.5**
Sex				
Female	10.7	3.5	2.0	9.7
Male	8.5	2.8	1.8	7.2
Race/ethnicity				
Asian, non-Hispanic	11.4	5.9	3.4	9.8
Black, non-Hispanic	5.3	1.2	0.2	4.8
Hispanic or Latino	7.4	2.0	1.2	6.9
White, non-Hispanic	11.8	4.1	2.8	10.3
More than one race, non-Hispanic	8.5	2.8	1.1	7.2
All other races, non-Hispanic	3.6	0.1	0.2	3.6
Socioeconomic status quintile				
Lowest fifth	5.5	1.7	0.5	4.9
Middle three fifths	8.9	2.7	1.8	8.0
Highest fifth	15.7	5.9	3.8	13.4
Parent's highest education				
Less than high school	5.3	1.7	0.2	4.7
High school	7.0	2.2	1.1	6.1
Associate's degree	8.8	2.4	1.7	8.0
Bachelor's degree	12.6	4.5	2.9	11.4
Master's degree or higher	14.5	5.3	3.5	12.1
Mathematics achievement quintile (2012)				
Lowest fifth	3.2	0.5	#	2.8
Middle three fifths	8.9	2.3	1.3	8.0
Highest fifth	17.0	7.6	5.2	14.6
School sector				
Public, 2009 and 2012	9.5	3.2	1.9	8.4
Private, 2009 and 2012	11.3	2.7	2.3	10.4
Changed sectors, 2009 to 2012	4.8	1.1	1.4	3.7

Rounds to zero.

[1] Includes all other subjects such as English, foreign language, and career and technical education courses.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSLS:09), First Follow-up and High School Transcript Study Restricted-Use File.

Figure 2.
Postsecondary education and work plans or status of fall 2009 ninth-graders: November 1, 2013
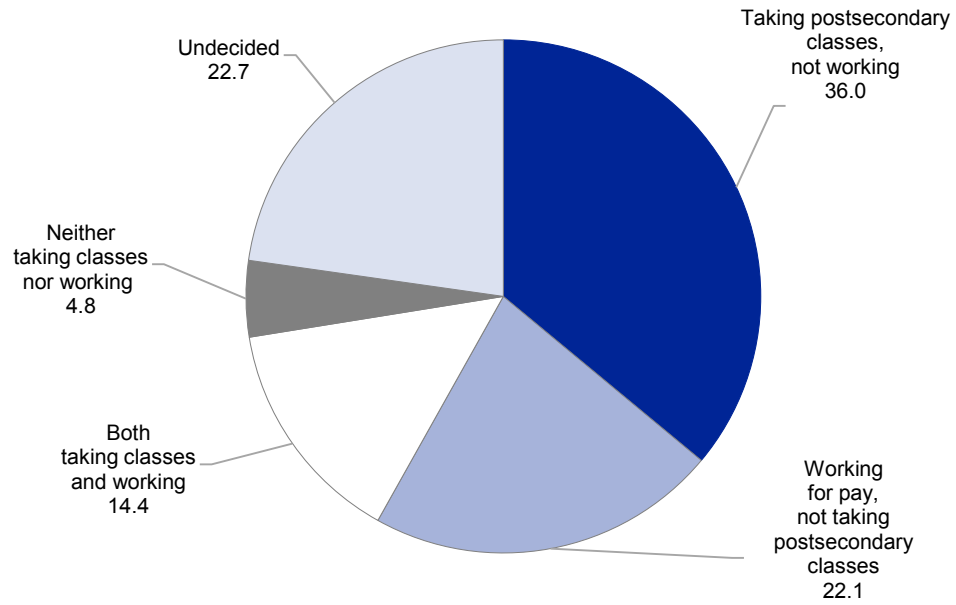
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSLS:09), First Follow-up and 2013 Update Public-Use File.

Table 10.

Postsecondary education and work plans or status of fall 2009 ninth-graders, by student and family characteristics: November 1, 2013

Characteristic	Taking postsecondary classes, not working	Working for pay, not taking postsecondary classes	Both taking classes and working	Neither taking classes nor working	Undecided
Total	**36.0**	**22.1**	**14.4**	**4.8**	**22.7**
Sex					
Female	38.7	23.5	11.7	4.8	21.3
Male	33.5	20.6	16.9	4.8	24.2
Race/ethnicity					
Asian, non-Hispanic	33.3	35.3	3.8	2.7	24.8
Black, non-Hispanic	32.1	17.7	14.9	6.6	28.7
Hispanic or Latino	36.6	15.9	15.7	5.9	26.0
White, non-Hispanic	36.2	25.8	14.5	3.8	19.7
More than one race, non-Hispanic	41.2	17.5	14.2	5.8	21.3
All other races, non-Hispanic	38.7	15.9	9.8	5.4	30.2
Socioeconomic status quintile					
Lowest quintile	32.8	10.8	18.7	7.0	30.7
Middle three quintiles	37.9	19.9	16.1	4.9	21.2
Highest quintile	33.7	40.3	4.4	2.3	19.3

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSLS:09), First Follow-up and 2013 Update Public-Use File.

Figure 3.

Percentage of high school completers from the fall 2009 ninth-grade class who applied to, registered at, were accepted by, and were taking or planning to take postsecondary classes in November 2013

NOTE: This figure represents 89.2 percent of the fall 2009 ninth-grade cohort (those who were high school completers).

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSLS:09), First Follow-up and 2013 Update Public-Use File.

Table 11.

Percentage of fall 2009 ninth-graders who were pursuing or planning to pursue selected postsecondary degree, among those who were taking or planning to take postsecondary classes, by student, family, and school characteristics: 2013

Characteristic	Bachelor's degree program	Associate's degree program	Diploma program for occupational training	No specific program	Other/ don't know
Total	**41.8**	**33.7**	**5.0**	**6.5**	**13.0**
Sex					
Female	41.8	33.8	4.5	6.8	13.1
Male	41.7	33.6	5.5	6.3	12.9
Race/ethnicity					
Asian, non-Hispanic	52.4	30.3	1.2	6.2	9.9
Black, non-Hispanic	32.3	35.3	5.3	6.2	20.8
Hispanic or Latino	25.1	41.4	6.6	8.4	18.4
White, non-Hispanic	50.1	30.6	4.3	5.8	9.1
More than one race, non-Hispanic	37.8	35.3	4.6	8.4	13.9
All other races, non-Hispanic	24.6	28.5	18.8	3.4	24.7
Socioeconomic status quintile					
Lowest fifth	22.6	37.4	9.5	6.9	23.6
Middle three fifths	36.2	38.1	5.1	7.6	13.0
Highest fifth	65.9	21.5	2.0	4.0	6.6
Parent's highest education					
Less than high school	15.3	36.3	11.8	9.1	27.5
High school	26.7	39.9	7.5	8.9	17.0
Associate's degree	33.4	40.8	5.3	6.3	14.2
Bachelor's degree	53.2	29.8	2.3	5.5	9.2
Master's degree or higher	67.1	20.3	2.2	4.0	6.5
Mathematics achievement quintile (2012)					
Lowest fifth	15.3	40.2	13.6	9.2	21.7
Middle three fifths	35.2	38.5	5.1	7.3	13.9
Highest fifth	67.1	20.9	0.9	3.8	7.3
School sector					
Public, 2009 and 2012	38.7	35.5	5.3	6.9	13.7
Private, 2009 and 2012	69.9	17.8	2.2	3.2	6.8
Changed sectors, 2009 to 2012	61.9	20.3	2.3	5.2	10.2

NOTE: This table represents 50.4 of the fall 2009 ninth-grade cohort (those who were taking or planning to take postsecondary classes in 2013).

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSLS:09), First Follow-up and 2013 Update Public-Use File.

Table 12.

Percentage of fall 2009 ninth-graders considering a science, technology, engineering, or math (STEM) major (among those with an identified major), by level of program and student, family, and school characteristics: 2013

Characteristic	Overall	Postsecondary program		
		Bachelor's degree program	Associate's degree program	Other program[1]
Total	**23.3**	**31.9**	**17.4**	**15.3**
Sex				
Female	14.5	23.6	7.9	6.5
Male	33.3	41.4	28.2	25.3
Race/ethnicity				
Asian, non-Hispanic	41.9	52.5	26.9	28.8
Black, non-Hispanic	15.5	22.9	12.3	11.1
Hispanic or Latino	19.8	27.9	16.2	17.6
White, non-Hispanic	24.8	31.9	17.9	15.8
More than one race, non-Hispanic	22.7	32.7	19.6	10.1
All other races, non-Hispanic	25.3	43.6	28.1	13.0
Socioeconomic status quintile				
Lowest fifth	16.8	28.6	15.1	11.6
Middle three fifths	21.7	29.6	17.1	16.0
Highest fifth	30.3	35.4	20.4	19.2
Parent's highest education				
Less than high school	18.0	31.8	16.6	14.1
High school	18.2	27.4	14.5	14.8
Associate's degree	19.7	29.6	15.2	12.6
Bachelor's degree	27.5	31.5	23.3	20.7
Master's degree or higher	30.3	36.4	18.6	14.4
Mathematics achievement quintile (2012)				
Lowest fifth	11.8	17.1	10.2	11.8
Middle three fifths	17.1	20.9	15.5	14.0
Highest fifth	39.9	44.5	30.9	26.5
School sector				
Public, 2009 and 2012	23.2	32.7	17.3	15.4
Private, 2009 and 2012	25.2	28.6	19.1	13.7
Changed sectors, 2009 to 2012	20.1	23.9	14.4	12.9

[1] Other programs include "certificate or diploma program (occupational training)," "no program, just taking courses," "other," and "don't know."

NOTE: About 10 percent of fall 2009 ninth-graders who were taking or planning to take postsecondary classes in 2013 indicated that they did not have a major they were considering.
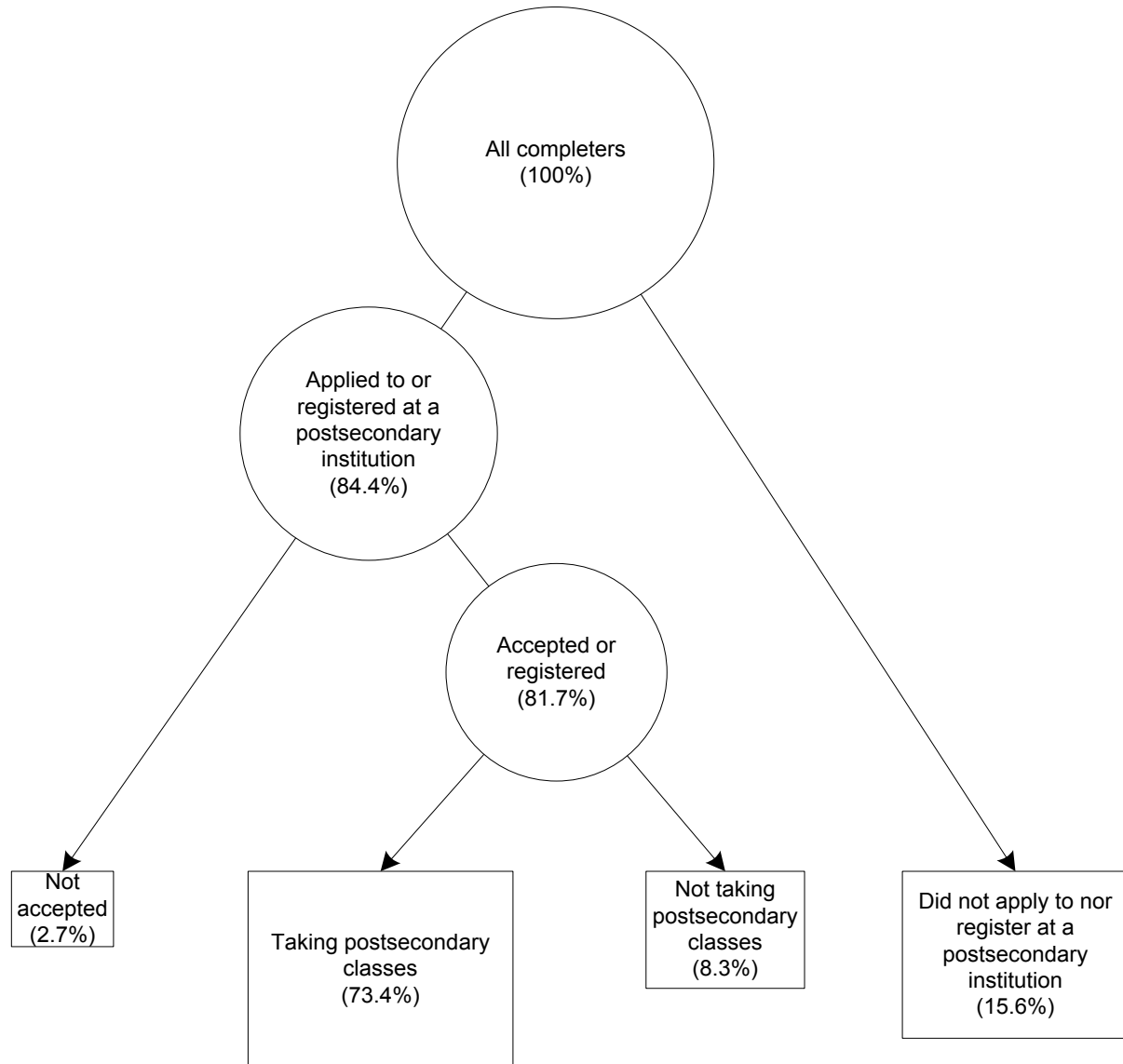
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSLS:09), First Follow-up and 2013 Update Public-Use File.

Table 13.

Percentage of fall 2009 ninth-graders with current work status, and average hours and wages among those working, by student, family, and school characteristics: 2013

Characteristic	Current work status			Among those working	
	Working full time	Working part time	Not working	Average hours worked	Average hourly wage
Total	**50.6**	**14.4**	**35.0**	**26.6**	**$9.10**
Sex					
Female	51.4	10.1	38.5	24.5	8.75
Male	49.7	18.7	31.6	28.5	9.43
Race/ethnicity					
Asian, non-Hispanic	72.2	5.8	22.0	21.9	10.45
Black, non-Hispanic	62.7	9.6	27.6	25.4	8.50
Hispanic or Latino	57.0	14.8	28.3	28.1	9.20
White, non-Hispanic	42.5	16.9	40.6	26.7	9.11
More than one race, non-Hispanic	52.4	10.5	37.1	25.0	9.09
All other races, non-Hispanic	65.7	8.1	26.2	24.6	8.89
Socioeconomic status quintile					
Lowest fifth	57.5	15.8	26.7	28.5	9.01
Middle three fifths	49.1	15.1	35.8	26.8	9.00
Highest fifth	47.9	11.3	40.8	24.3	9.43
Parent's highest education					
Less than high school	60.6	15.9	23.5	28.9	8.73
High school	52.8	16.4	30.8	28.0	9.08
Associate's degree	48.2	14.1	37.7	26.2	8.90
Bachelor's degree	47.5	13.5	39.0	25.9	9.29
Master's degree or higher	48.5	11.2	40.2	24.4	9.27
Mathematics achievement quintile (2012)					
Lowest fifth	56.3	16.9	26.8	28.9	9.00
Middle three fifths	49.0	14.7	36.3	26.7	9.05
Highest fifth	49.8	11.4	38.7	24.4	9.31
School sector					
Public, 2009 and 2012	50.7	14.7	34.6	26.7	9.07
Private, 2009 and 2012	48.9	12.2	38.9	25.0	9.33
Changed sectors, 2009 to 2012	48.6	8.4	43.0	24.0	9.78

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSLS:09), First Follow-up and 2013 Update Public-Use File.

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Appendix A: Technical Notes and Methodology

Appendix A provides information about the High School Longitudinal Study of 2009 (HSLS:09), as well as information about statistical procedures and analysis variables used in this report. The HSLS:09 2013 Update and High School Transcript Study are discussed in the first eight sections (A.1 through A.8). Discussion of the studies is followed by information on the report's statistical procedures (A.9), generation of standard errors (A.10), and definitions of analysis variables (A.11). For further information on the HSLS:09 base year, see the HSLS:09 Base-Year Data File Documentation (DFD) (Ingels et al. 2011); for the first follow-up, see the HSLS:09 Base-Year to First Follow-up Data File Documentation (DFD) (Ingels et al. 2014); and for the 2013 update and high school transcripts collection, see the HSLS:09 2013 Update and High School Transcript Data File Documentation (DFD) (Ingels et al. 2015).

A.1 Design and Purposes of HSLS:09

HSLS:09 is the fifth in a series of National Center for Education Statistics (NCES) secondary education longitudinal studies. All of the studies monitor the transition of national samples of young people from the high school to postsecondary years, including further education, participation in the work force, and the assumption of other adult roles. The core research questions for HSLS:09 explore secondary-to-postsecondary transition plans and the evolution of those plans; the paths into and out of science, technology, engineering, and mathematics; and the educational and social experiences that affect these shifts.

The HSLS:09 base-year administration took place in the 2009–10 school year, with a randomly selected sample of fall-term ninth-graders in 944 public and private high schools with both a ninth and an eleventh grade. Students took a mathematics assessment and survey online. In addition, students' parents, school administrators, and mathematics and science teachers as well as the school's lead counselor completed surveys on the phone or on the Web. The first follow-up of HSLS:09 took place in 2012 when most sample members were in the spring term of the eleventh grade. Dropouts, newly homeschooled, and transfer students were followed, as well as those who remained in the base-year school. All sample members were eligible to complete both a questionnaire and a mathematics assessment. In addition

to a student questionnaire and mathematics assessment, surveys were also given to parents, administrators and counselors.

The 2013 Update survey took place between June and December 2013. The survey, which could be completed by either the sample member or a parent, was designed to gather basic information about the sample member's high school completion status or plans, postsecondary education and work plans, and the college application and financing process. Questions were adapted so that parent respondents were providing information about their child's activities and plans, although some subjective questions (e.g., about the reasons for choosing a college) were also asked and may systematically differ across parents and children. Because the survey was administered over a number of months that preceded and overlapped with the traditional start of college classes in the fall, a number of questions were anchored to November 1, 2013, and designed to elicit the anticipated or realized activities of respondents on that date.

Between fall 2013 and spring 2014, high school transcripts were gathered from all schools that students had attended—including schools known from prior rounds, schools identified by the student or parent during the 2013 update survey, or schools discovered during the request for transcripts from existing schools. Coursetaking records from transcripts were keyed and coded using the School Courses for the Exchange of Data (SCED), a code frame that classifies courses into standard 12-digit codes reflecting their course content and placement within subjects.[4] HSLS:09's use of SCED marks the first implementation of this code frame on any NCES transcript study. Course credits, course grades, and other measures derived from transcripts were standardized to ensure comparability across schools. In addition, student records were matched to external data sources to obtain data on SAT and ACT scores, Free Application for Federal Student Aid (FAFSA) data, and GED completion data.

A second follow-up interview will take place in 2016, when most sample members will be 3 years beyond high school graduation. The number and timing of future follow-ups beyond 2016 is yet to be determined, although the expectation is that the cohort will be followed at least to age 30, with a questionnaire administration and a postsecondary education transcript collection in 2025–26.

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[4] Examples of SCED five-digit subject codes and course titles can be found in tables A-5 and A-6 of this report.

A.2 Instrumentation

2013 Update. The goal of the 2013 update was to efficiently collect information on sample members' status with respect to high school completion, postsecondary applications and enrollment, financial aid applications and offers, and employment. Two instrument design strategies were used to maximize the response rate. First, the instrument was designed to last about 15 minutes, approximately half the length of the previous HSLS:09 instruments. Second, either the sample member or a parent could respond to the interview. Given this design, an effort was made to select primarily factual questions that sample members and parents would respond to consistently. The data file includes a variable indicating whether the sample member or the parent was the respondent. The instrument was designed for self-administration via the Web or computer-assisted telephone interviewing (CATI). In addition to the full-length version of the instrument, a 5-minute abbreviated version was developed for CATI, Web, and paper-and-pencil self-administration for a small subset of hard-to-reach sample members.

In addition to the 2013 update questionnaire, data from prior-round student and parent questionnaires are used in this report, specifically as row variables in tables. Student questionnaires were administered in the base year and first follow-up and gathered a wide range of data such as demographic information (e.g., sex, race/ethnicity); language background; and school experiences in the current and previous school year (including math and science experiences and course enrollment). There was also both a base-year and first follow-up parent survey, the latter conducted with a subsample of parents.[5] The parent questionnaire identified household members and their roles and characteristics, and obtained demographic data and information on immigration status and language use, socioeconomic status (education, occupation, income), the student's educational history (including grade retention and change of schools), family interactions, parental involvement in the cohort member's learning, and plans and preparations for postsecondary education. In all row variables used in this report, data are derived from the 2012 student and parent surveys. The one exception is the school sector variable, which uses data from both the base year and first follow-up to classify students' enrollment patterns with respect to school sector.

High School Transcript Study. High school transcript and school catalog keying and coding was completed using a keying and coding system for data entry. Course

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[5] Further detail on the subsample design of the first follow-up parent survey can be found in section 3.3.4.1 of the HSLS:09 Base-Year to First Follow-up Data File Documentation (DFD) (Ingels et al. 2014).

catalogs for base-year schools were keyed and coded to collect data for a course offerings data file used in assigning individual student courses to an appropriate SCED code (the course offerings file is also provided for analytical use as part of the study database). Information coded from transcripts includes course name, course subject as coded using a SCED (five-digit) subject code, sequence and rigor using SCED definitions, credits awarded, credit type, term type, grade level, grade received, location where course was taken, and multiple other attributes such as whether the course was an AP or a career/technical education course. Course credit and course grades were standardized to ensure comparability across schools.

Courses were coded using version 2.0 of the SCED, a secondary school course classification system (http://nces.ed.gov/forum/SCED.asp). The SCED is a 12-digit code made up of four elements: course subject, level of rigor, available credit, and sequence. The subject code accounts for the first five digits of the full SCED code. The first two digits indicate the subject area (e.g., mathematics or social studies), and the complete five-digit code provides the specific definition of the course subject. There are 23 subject codes and 1,672 total five-digit codes. See Ingels et al. (2015) for detailed information on the use of SCED in HSLS:09.

Rigor identifies the level of difficulty, which is captured using one of the following five options: B – basic or remedial; G – general or regular; E – enriched or advanced; H – honors; and X – no level of rigor. Available credit captures the number of Carnegie units earned for completing the course. A course that meets daily for a year is coded as one Carnegie unit. Other courses, such as physical education, may only meet for half a year or every other day and would be coded as 0.5 Carnegie units or other amount consistent with the school term and school course credit policies.

Sequence refers to the order in which related courses are taken. In the SCED, courses can only be in sequence if the same five-digit subject code is used for the related courses. For example, Accounting I and II are consecutive courses taken in the accounting department and are in a sequence because both courses are coded using the same subject code (12104 – Accounting). Spanish I and II would not be in sequence, although they are related, because there are different subject codes for these courses (06101 – Spanish I and 06102 – Spanish II). Sequence is reported as two characters to capture the placement of the course in the sequence and the total number of courses in the set (e.g., part 'n' of 'm' parts). In the accounting example above, the sequence would be 1 of 2 for the Accounting I course to indicate it is the first of two courses in a series.

Other HSLS:09 instruments. Although not utilized in the analyses in this brief report, HSLS:09 also contains questionnaire data from several other sources including a

school administrator survey (base year and first follow-up), a counselor survey (base year and first follow-up), and surveys of mathematics and science teachers (in the base year only). Further information about all HSLS:09 questionnaires may be found in chapter 2 of the HSLS:09 Base-Year to First Follow-up Data File Documentation (DFD) (Ingels et al. 2014).

A.3   Sample Design

Base year and first follow-up. In the base-year survey of HSLS:09, students were sampled through a two-stage process. First, stratified random sampling and school recruitment resulted in the identification and contacting of 1,889 eligible base-year schools. A total of 944 of these schools participated in the study, resulting in a 56 percent weighted (or 50 percent unweighted) school response rate. The target population at the school level was defined as regular public schools, including public charter schools and private schools in the 50 United States and the District of Columbia, providing instruction in both ninth and eleventh grade. HSLS:09 base-year school and student samples are nationally representative and also state representative for a subset of 10 states. The target population of students was defined to include all ninth-grade students who attended the study-eligible schools in the fall 2009 term. In the second stage of sampling, students were randomly selected from school enrollment rosters, with 25,206 eligible selections (or about 27 students per school). All students who met the target population definition were deemed eligible for the study. Of the 25,206 students eligible for the base year, 25,184 were eligible for the first follow-up (22 were deceased). Table A-1 includes eligible sample sizes (as well as corresponding participation rates) for the full complement of base-year and first follow-up questionnaires/assessments.

2013 Update and High School Transcript Study. Of the 25,206 students eligible for the base year, 25,168 were eligible for the 2013 Update and the High School Transcript Study (a total of 38 were deceased). Not all cases were fielded: sample members were excluded from fielding when neither base-year nor first follow-up data were collected for them, or were out of scope for a given round in accordance with one of four out of scope categories described below. These unfielded cases are classified as nonrespondents and appear in the sample denominator for calculation of response rates.

Fielded cases are those for which an interview is pursued; in contrast, no attempt is made to interview unfielded cases. While HSLS:09 begins with a study-eligible base year sample (including only cases with data from at least one prior round), some sample members will not prove to be "in scope" in a particular round of data

collection. Out of scope cases can be temporarily out of scope, say out of scope for the 2013 Update but not necessarily for the second follow-up—or they may be permanently out of scope, as is the case in dealing with sample members who died in the course of a longitudinal study. Out of scope cases fall into one of four possible statuses:

1. Students who are eligible (fall 2009 9th graders) but *incapable* of meaningful participation (defined in terms of test-taking and questionnaire-response). These students are questionnaire-incapable. They cannot participate, owing to either a language barrier or a severe disability. Nonetheless, some may change status in later rounds (for example, a student may become fluent in English over time). The number of sample members who were deemed incapable of meaningful participation was 548 for the base year, 251 for the first follow-up, and 88 for the 2013 update.

2. Students who are *inaccessible*—(these students are temporarily out scope, that is, their status is always re-assessed in the following round). Any of several factors can render sample members inaccessible, though chiefly the following: out of the country, incarcerated, hospitalized or otherwise incapacitated, thus making for unavailability during the field period.

3. Students who have died—*deceased* students are permanently out of scope.

4. Study withdrawals—some sample members refused to participate and, additionally, requested that they not be contacted again. While no attempt is made to interview study withdrawals, their nonparticipation counts against the study's response rate, that is, counts as an automatic refusal for each successive round.

In calculating response rates, there are two types to consider. The *unconditional response rate* is the response rate calculated with no exceptions for the temporarily out of scope, unfielded cases; only the deceased are removed from the study denominator. The unconditional response rate supports statistical description and estimation.

The *conditional response rate* removes all four categories of temporary out of scope students from the denominator. The conditional response rate is a measure of the methodological success of the study, of what its data collection effort was able to accomplish. For purposes of studying population parameters as estimated in this First Look report, the unconditional response rate is of prime importance. However, for interested readers, conditional response results are reported in the HSLS:09 *Data File Documentation* (Ingels et al. 2015).

Table A-1 includes eligible sample sizes (as well as corresponding participation rates) for the 2013 Update and the High School Transcript Study.

A.4 Response Rates

Table A-1 provides a summary of the weighted student unit response rates for each round of data collection. The 2013 Update data collection ended with a 73.1 percent response rate. For transcripts, an 87.1 percent response rate was achieved. Unweighted participation rates restricted to the released or fielded sample may be found in the Data File Documentation (Ingels et al. 2015).

Table A-1. Number and percent of completed surveys or complete high school transcripts or their combinations, for the student sample

Study Round and High School Transcript Combinations	Data Source	Eligible	Participated	Weighted percent[1]
Base year	Student questionnaire	25,206	21,444	85.7
	Student assessment	25,206	20,781	83.0
	Parent questionnaire	21,444	16,429	76.1
	School administrator	21,444	20,301	94.2
	School counselor	21,444	19,505	90.2
	Teacher questionnaires			
	Math teacher	20,970	16,035	72.3
	Science teacher	20,101	14,629	70.0
First follow-up	Student questionnaire	25,184	20,594	82.0
	Student assessment	25,184	18,507	73.0
	Parent questionnaire[2]	11,952	8,651	72.5
Base year and first follow-up[3]	Student questionnaire	25,184	18,623	74.3
	Student assessment	25,184	16,356	64.7
	Parent questionnaire[4]	10,210	6,611	64.2
2013 Update	Student questionnaire	25,168	18,558	73.1

See notes at end of table.

Table A-1.   Number and percent of completed surveys or complete high school transcripts or their combinations, for the student sample—Continued

Study Round and High School Transcript Combinations	Data Source	Eligible	Participated	Weighted percent[1]
Base year and 2013 Update[5]	Student questionnaire	25,168	17,117	67.6
First follow-up and 2013 Update[6]	Student questionnaire	25,168	17,282	68.0
Base year, first follow-up and 2013 Update[7]	Student questionnaire	25,168	15,857	62.5
High school transcript	High school transcript[8]	25,167	21,925	87.1
High school transcript and 2013 Update	High school transcript	25,167	17,656	70.2
High school transcript, base year and 2013 Update	High school transcript	25,167	16,303	64.7
High school transcript, first follow-up and 2013 Update	High school transcript	25,167	16,525	65.6
High school transcript, base year, first follow-up and 2013 Update	High school transcript	25,167	15,188	60.4

[1] All weighted percentages are based on the row under consideration and are calculated with the student base weight.

[2] Details of the parent subsample design are provided in section 3.3.4 of the first follow-up documentation.

[3] Only sampled students who participated in both the base year and first follow-up are considered as participants.

[4] Participants are identified as sampled students who participated in both the base year and first follow-up and who have parent responses in both the base year and first follow-up.

[5] Only sampled students who participated in both the base year and 2013 Update are considered as participants.

[6] Only sampled students who participated in both the first follow-up and 2013 Update are considered as participants.

[7] Only sampled students who participated in the base year, first follow-up, and 2013 Update are considered as participants.

[8] The number of participants associated with high school transcript data sources correspond to the number of sample members with high school transcript data and who also responded in the study rounds indicated in the first column.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSLS:09), Base Year, First Follow-Up, 2013 Update, and High School Transcript Study.

For the High School Transcript Study, a total of 3,028 out of 4,249 schools (including 910 of 944 base-year schools, and 2,118 of 3,305 schools to which base-year sample members had transferred) submitted transcripts, resulting in an unweighted school transcript component participation rate of 71 percent. Table A-2 presents the percentage of base-year and transfer schools that provided transcripts by school characteristics. The percentage of students for whom at least one transcript was received was 94 percent (unweighted; not shown in table). This rate did not differ substantially by student or school characteristics.

Table A-2. **Participation rates of base-year and transfer schools that provided student transcripts, by school control, location, and region: 2013–14**

	Base-year		Transfer		All	
	Number	Percent	Number	Percent	Number	Percent
Total	910	96.4	2,118	64.1	3,028	71.3
Control						
Public	752	98.0	1,868	68.5	2,620	75.0
Catholic	94	92.2	59	68.6	153	81.4
Private Other	64	85.3	133	69.3	197	73.8
Unknown	†	†	58	19.4	58	19.4
Location						
City	255	94.1	655	67.1	910	73.0
Suburb	273	96.8	614	67.0	887	74.0
Town	123	96.1	209	67.4	332	75.8
Rural	259	98.5	582	72.8	841	79.1
Unknown	†	†	58	19.1	58	19.1
Region[1]						
Northeast	143	96.0	268	72.0	411	78.9
Midwest	240	95.6	483	65.8	723	73.4
South	373	98.2	818	69.0	1,191	76.1
West	154	93.9	488	69.7	642	74.3
Unknown	†	†	61	19.4	61	19.4

† Not applicable.
[1] Region is defined by the U.S. Census Bureau based on the state in which the school is located.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSLS:09), High School Transcript Study.

A.5 Weighting

Analytic weights are used in combination with software that accounts for the HSLS:09 complex survey design to produce estimates for the target population, with appropriate standard errors. When appropriately weighted, the HSLS:09 is generalizable to the U.S. population of ninth-graders who were attending schools with both a ninth and eleventh grade in fall 2009. Estimates in figure 1 and tables 1 through 9 were produced using the longitudinal first follow-up to transcript collection weight (W3W2STUTR). This weight is appropriate for analysis involving first follow-up data and transcript data; nonrespondents to the first follow-up and/or 2013 update are given a zero weight and do not count toward estimates. Estimates in figures 2 and 3 and in tables 10 through 13 were produced using the longitudinal first follow-up to 2013 Update weight (W3W2STU). This weight is appropriate for analysis involving first follow-up data and 2013 update survey data; nonrespondents to either or both components are given a zero weight and do not count toward estimates. In the use of both weights, their corresponding balanced repeated replicate (BRR) weights were used to compute standard errors.

A.6 Nonresponse Bias Analysis

Nonresponse bias analyses were conducted to determine whether unit nonresponse from any of the data sources significantly increased the estimated bias for population estimates. Table A-3 provides a summary of findings for the data components included in this report before and after the base weights were adjusted for nonresponse. Further information on the procedures for evaluating nonresponse bias and for their results can be found in chapter 6 of the HSLS:09 2013 Update and High School Transcript Data File Documentation (DFD) (Ingels et al. 2015).

Table A-3. **Summary statistics for unit nonresponse bias analyses before and after a weight adjustment for nonresponse, by 2013 update analytic weights**

Analytic weight	Significant bias tests at 0.05 level[1]		Median absolute relative bias[2]		
	Percent before weight adjustment	Percent after weight adjustment	Percent before weight adjustment	Percent after weight adjustment	Percent relative change[3]
Student					
2013 Update	32.8	0	1.9	0	-100.0
[W3STUDENT] Base year to 2013 update	38.8	0	2.8	0	-100.0
[W3W1STU] Base year to first follow-up to 2013 update	41.8	0	3.2	0	-100.0
[W3W2STU] First follow-up to 2013 update	38.8	0	2.3	0	-100.0
[W3W1W2STU] Transcript					
[W3HSTRANS] High school transcript	19.4	1.5	1.4	0	-100.0
[W3STUDENTTR] Transcript and 2013 update	26.9	0	2.3	0	-100.0
[W3W1STUTR] Transcript and base year to 2013 update	35.8	0	2.9	0	-100.0
[W3W2STUTR] Transcript and base year to first follow-up to 2013 update	31.3	0	2.8	0	-100.0
[W3W1W2STUTR] Transcript and first follow-up to 2013 update	43.3	0	3.5	0	-100.0

[1] Before and after are in reference to the nonresponse weight adjustment. A total of 67 statistical tests were performed; the number 67 was used as the basis for the reported percentages.

[2] The percent relative bias is calculated as 100 multiplied by the estimated bias divided by the estimated value. The absolute relative bias is the absolute value of the (percent) relative bias.

[3] The percent relative change is calculated as 100 multiplied by the median value after adjustment minus the median value before adjustment divided by the median value before adjustment.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSLS:09), 2013 Update and High School Transcript Study.

A.7 Imputation

Imputation addresses the potential concern related to missing values in the data supplied by respondents. Advantages of using imputed values include the ability to use all study respondent records in an analysis (complete-case analysis), which affords more power for statistical tests. Additionally, if the imputation procedure is effective (i.e., the imputed value is equal to [or close to] the true value), the analysis results are likely less biased than those produced with the incomplete data file. (On

both the benefits and techniques of imputation, see, for example, Little and Rubin 2002.)

To alleviate the problem of missing data from a respondent record, statistical imputation methods were employed for the 2013 Update and High School Transcript Study that were similar to those used for the HSLS:09 base year and first follow-up. Five key analysis variables were identified for single-value imputation from the 2013 Update and High School Transcript Study data: whether the respondent has a high school credential (S3HSCRED), the type of high school credential earned (S3HSCREDTYPE), whether the respondent was taking postsecondary classes as of November 1, 2013 (S3CLASSES), whether the respondent was working for pay as of November 1, 2013 (S3WORK), and the date that a dropout or alternative completer last attended high school (X3LASTHSDATE). Additional variables were considered for this list but were excluded because of either a high item response rate or they were deemed to be of little analytic importance.

Stochastic methods were used to impute the missing values. Specifically, a weighted sequential hot-deck (WSHD; statistical) imputation procedure (Cox 1980; Iannacchione 1982) using the final 2013 update student analysis weight (W3STUDENT) was applied to the missing values for the variables listed above. The WSHD procedure replaces missing data with valid data from a donor record (i.e., item respondent) within an imputation class. In general, variables with lower item nonresponse rates were imputed earlier in the process. Regardless of the method, indicator variables (flags) were created to allow users to easily identify the imputed values. Further information on imputation procedures and quality checks can be found in chapter 6 of the HSLS:09 2013 Update and High School Transcript Data File Documentation (DFD) (Ingels et al. 2015).

A.8 Disclosure Risk Analysis and Protections

The disclosure treatment methods used to produce the HSLS:09 2013 Update and High School Transcript Study public-use data files include variable recoding, suppressing, and swapping. Some variables that had values with extremely low frequencies were recoded to ensure that the recoded values occurred with a reasonable frequency. Other variables were recoded from continuous to categorical values. Thus, rare events or characteristics have been masked for certain variables. Other variables were classified as high risk and were suppressed from the public-use file. The suppressing technique entailed removing the response from the public-use file (i.e., reset to a "suppressed" reserve code).

A.9 Statistical Procedures in This Report

Comparisons that appear in the selected findings have been tested for statistical significance (set at a probability of 0.05) to ensure that the differences are larger than those that might be expected because of sampling variation. There were no adjustments for multiple comparisons. The conclusions stated in this report are supported by a two-tailed test of statistical significance, specifically, Student's t test. Whether the statistical test is considered significant is determined by calculating a t value for the difference between a pair of means or percentages and comparing this value to published tables of values, called critical values. The alpha level is an *a priori* statement of the probability that a difference exists in fact rather than by chance.

The t statistic between estimates from various subgroups presented in the tables can be computed by using the following formula:

$$t = \frac{x_1 - x_2}{\sqrt{SE_1^2 + SE_2^2}}$$

where x_1 and x_2 are the estimates to be compared (e.g., the means of sample members in two groups), and SE_1 and SE_2 are their corresponding standard errors. This formula is valid only for independent estimates. The t statistic for dependent groups is computed using the following formula (where r is the correlation between groups):

$$t = \frac{x_1 - x_2}{\sqrt{SE_1^2 + SE_2^2 - 2(r)SE_1 SE_2}}$$

A.10 Survey Standard Errors in This Report

Because the HSLS:09 sample design involved stratification, the disproportionate sampling of certain strata, and clustered (i.e., multistage) probability sampling, the resulting statistics are more variable than they would have been if they had been based on data from a simple random sample of the same size.

Calculating exact standard errors for survey estimates can be difficult. Several procedures are available for calculating precise estimates of sampling errors for complex samples. Procedures such as Taylor Series approximations, balanced repeated replicate (BRR), and Jackknife Repeated Replication, which can be found in advanced statistical programs such as SUDAAN, AM, or WESVAR, produce similar results. The HSLS:09 analyses included in this report used the BRR procedure to calculate standard errors.

A.11 Definitions of Analysis Variables

This section describes the variables used in each of the tables and figures of this report. The first subsection (A11.1) contains the student background variables (row variables) used throughout the tables and figures. The section subsection (A11.2) describes transcript-derived variables and coursetaking variables, such as credits earned and GPA in various subjects, used as column variables in figure 1 and tables 1 through 9. Specific SCED codes corresponding to course classifications are included in this subsection. The third subsection (A11.3) describes measures relating to postsecondary education and work experiences used as column variables in figures 2 and 3 and tables 10 through 13. All analyses for the current report use the public-use versions of all variables.

To see the base year through 2013 Update survey instruments (questionnaires) and obtain specific item and response option wording, researchers can consult http://www.nces.ed.gov/surveys/hsls09/index.asp. Versions of the questionnaires with routing logic and flow charts representing how respondents were assigned questions can be found in appendix A of the HSLS:09 Base-Year to First Follow-up Data File Documentation (DFD) (Ingels et al. 2014) and appendix A of the HSLS:09 2013 Update and High School Transcript Data File Documentation (DFD) (Ingels et al. 2015).

A.11.1 Student Background Characteristics

Sex (X2SEX)

X2SEX updates the base-year variable X1SEX. Sex of the sample member is taken from the base-year student questionnaire; if missing, it is supplemented by the parent questionnaire or school-provided sampling roster. If the sex indicated by any of these three sources was inconsistent, X1SEX was coded based on a review of student name records. Sex information was gathered also from new respondents in the first follow-up.

Race/Ethnicity (X2RACE)

First follow-up race/ethnicity is an update of base-year race (X1RACE). It is a composite rendering of the racial and ethnic group to which a student belongs, based on separate questions about race and Hispanic ethnicity. The categories of X1RACE were collapsed into non-Hispanic Asian; non-Hispanic Black; Hispanic; non-Hispanic White; non-Hispanic more than one race; and other non-Hispanic races (i.e., non-Hispanic American Indian or Alaska Native, and non-Hispanic Native

Hawaiian or other Pacific Islander). Race/ethnicity is based on data from the student questionnaire, if available; if not available from the student questionnaire, it is based on, in order of preference, data from the school-provided sampling roster or data from the parent questionnaire. Race information was gathered also from new respondents in the first follow-up.

Socioeconomic Status Quintile (X2SESQ5)

Socioeconomic status (SES) is a measure of the family's relative position in American society. The continuous SES index score is based on five components: education of each parent or guardian or education of the single parent/guardian, where applicable (X2PAR1EDU, X2PAR2EDU); the occupational prestige score of each parent or guardian or the prestige score of the single parent/guardian, where applicable (as determined from occupation codes X2PAR1OCC6 and X2PAR2OCC6); and family income (X2FAMINCOME). In this report, SES is reported in quintiles (fifths) of an SES index score (the index is a continuous measure that is also available for analytic use). The quintile measure divides the weighted (population-estimated) SES distribution into five equal groups. Quintile 1 corresponds to the lowest one-fifth of the population, and quintile 5 to the highest. To determine the quintile cut-points, the weighted distribution of the SES index score was divided at the 20th, 40th, 60th, and 80th percentiles. For this report, the middle three quintiles were combined to form one category.

Parents' Highest Education (X2PAREDU)

Indicates the highest level of education achieved by either parent. X2PAREDU is constructed from two composite variables (X2PAR1EDU and X2PAR2EDU) which are pulled from the first follow-up parent questionnaire, and, if missing, are imputed from the base-year parent questionnaire and the first follow-up student questionnaire. Categories for completing a high school diploma, GED, or alternative credential, and for completing a certificate or diploma from a school that provides occupational training, were recoded into a single category of "high school." The top two categories ("Master's degree" and "Ph.D./M.D./Law/other high-level professional degree") were also recoded into a single category ("Master's degree or higher").

Mathematics Assessment Quintile (X2TXMQUINT)

Both base-year and first follow-up respondents were given an HSLS:09-specific mathematics assessment. The assessment was designed to provide a measure of student achievement in algebraic reasoning at two points in time (ninth grade and

when the majority of students were in eleventh grade). The test framework covers a cross-section of understandings representative of the major domains of algebra and the key processes of algebra. The test and item specifications describe six domains of algebraic content and four algebraic processes:

- Algebraic Content Domains:
    - The language of algebra
    - Proportional relationships and change
    - Linear equations, inequalities, and functions
    - Nonlinear equations, inequalities, and functions
    - Systems of equations
    - Sequences and recursive relationships
- Algebraic Processes:
    - Demonstrating algebraic skills
    - Using representations of algebraic ideas
    - Performing algebraic reasoning
    - Solving algebraic problems

Both in the base year and first follow-up, the assessment was built as a two-stage test, with a router (completed by all students) and a second-stage assignment of one of three forms of variable difficulty. The scores used to describe students' performance on the mathematics assessment are based on Item Response Theory (IRT). The IRT model uses patterns of correct, incorrect, and omitted responses to obtain ability estimates that are comparable across the low-, moderate-, and high-difficulty test forms.

The first follow-up math quintile score (X2TXMQUINT) is a norm-referenced measure of achievement. The quintile score divides the weighted (population estimate) achievement distributions into five equal groups, based on the continuous math score (X2TXMTSCOR). Quintile 1 corresponds to the lowest achieving one-fifth of the population, and quintile 5 to the highest. To determine the quintile cut-points, the weighted distribution of the standardized scores was divided at the 20th, 40th, 60th, and 80th percentiles. See chapter 2 of the HSLS:09 Base-Year to First Follow-up Data File Documentation (DFD) (Ingels et al. 2014) for more information on the design of the assessment, the modeling of scores using IRT, and the derivation of the mathematics quintile variable.

School Sector (X1CONTROL, X2CONTROL)

The school sector variable uses information from both the base year (X1CONTROL) and first follow-up (X2CONTROL) to identify students who attended a school in the same sector (public or private) in both 2009 and 2012 or who changed sectors between 2009 and 2012. Dropouts, early graduates, or other respondents for whom 2012 school sector is not applicable or unknown were placed in their respective same-sector categories. Base-year public and private school sector is derived from the source data for field test and full-scale sampling: the NCES Common Core of Data (CCD) 2005–06 and the Private School Survey (PSS) 2005–06. First follow-up school sector is derived from CCD and PSS 2011–12.

Base-Year Math and Science Course (X3HIMATH9, X3HISCI9)

For tables 4 (math) and 6 (science), an additional row variable was added to compare the ninth-grade course taken by students to the highest level of math or science reached by 2013 (described in the subsequent section). The composite variables relating to math and science course taken in the ninth grade were collapsed into three categories as indicated in the respective tables.

A.11.2   Transcript Variables and High School Coursetaking

High School Completion Status (X3HSCOMPSTAT)

Data from transcript records and student or parent responses to the 2013 Update survey were used to create a composite measure of high school completion status. Non-respondents to the 2013 update survey who had transcript (X3TOUTCOME) values of transferred, left for other reason, or status cannot be determined (listed as 5 on X3HSCOMPSTAT) were excluded from the analysis.

Total and Academic Courses Grade Point Averages (X3TGPATOT, X3TGPAACAD)

Total grade point average (GPA) (X3TGPATOT) and academic GPA (X3TGPAACAD) are based on high school transcripts. Total GPA includes all courses. Academic GPA includes only courses in English, mathematics, science, social studies, foreign language, and fine arts (SCED subject codes beginning with 01, 02, 03, 04, 06, and 07 respectively).

Total, Academic, Career and Technical Education (CTE), and Other Credits Earned (X3TCREDTOT, X3TCREDACAD, X3TCREDCTE, X3TCREDNONA)

Credit variables are based on high school transcripts and standardized to Carnegie units (one Carnegie unit represents one hour of class per day for a full school year). Total credits earned includes all courses. Academic credits earned includes only courses in English, mathematics, science, social studies, fine arts, and foreign language. CTE credits include courses in the subject areas listed in table A-4, along with the corresponding two-digit or five-digit SCED subject code ranges. All other nonacademic, non-CTE SCED course codes are included in the "other credits earned" composite variable.

Table A-4. Career and technical education (CTE) School Courses for the Exchange of Data (SCED) codes

Subject area	First two digits of SCED code
Computer and information sciences	10
Communications	11
Business and Marketing	12
Manufacturing	13
Health care sciences	14
Public, protective, and government service	15
Hospitality and tourism	16
Architecture and construction	17
Agriculture, food, and natural resources	18
Human services	19
Transportation	20
Engineering and technology	21
Other CTE areas	*SCED codes*
Career exploration/development	22151 through 22153
Family and consumer sciences	22201 through 22249

Credits in English, Mathematics, Science, Social Studies, Foreign Language, Fine Arts, and STEM (X3TCREDENG, X3TCREDMAT, X3TCREDSCI, X3TCREDSOCST, X3TCREDLANG, X3TCREDART, X3TCREDSTEM)

Credit variables are based on high school transcripts and standardized to Carnegie units. Academic subjects are defined by the first two digits of the SCED subject code, as described earlier. STEM courses are defined as courses in mathematics, science, computer and information sciences, and engineering and technology (SCED subject codes beginning with 02, 03, 10, and 21).

Highest Level of Mathematics and Science (X3THIMATH, X3THISCI)

The measures of highest level of mathematics and highest level of science in which credits were earned are based on course-level data from transcripts. The SCED subject codes and course titles belonging to each category are provided in tables A-5 (for mathematics) and A-6 (for science). Any student receiving nonzero credit in one of the courses in a given category is placed into that category, with membership in higher categories superseding membership in lower ones (i.e., a student earning 0.5 credit in calculus would be placed in "calculus," even if he or she earned credit at each other math level).

Table A-5.	Categories and School Courses for the Exchange of Data (SCED) subject codes for highest level of mathematics
Basic math	
02001	Informal Mathematics
02003	Particular Topics in Foundation Math
02047	Foundation Math—Independent Study
02049	Foundation Math—Other
02002	General Math
02039	Mathematics—General
02151	General Applied Math
02152	Occupationally Applied Math
02153	Technical Math
02154	Business Math
02155	Business Math with Algebra
02156	Computer Math with Algebra
02157	Consumer Math
02991	History of Math
02993	Mathematics—Test Preparation
02994	Mathematics Proficiency Development
02995	Mathematics—Aide
02996	Mathematics—Supplemental
02997	Mathematics—Independent Study
02998	Mathematics—Workplace Experience
02999	Mathematics—Other
02051	Pre-Algebra
02053	Algebra I—Part 1
Algebra I	
02052	Algebra I
02054	Algebra I—Part 2
02069	Algebra—Other

Continued.

Table A-5. Categories and School Courses for the Exchange of Data (SCED) subject codes for highest level of mathematics—Continued

Geometry

02071	Informal Geometry
02072	Geometry
02073	Analytic Geometry
02074	Principles of Algebra and Geometry
02075	Particular Topics in Geometry
02079	Geometry—Other
02135	IB Mathematics (Middle Years Program)

Algebra II

02141	Particular Topics in Analytic Mathematics
02055	Transition Algebra
02056	Algebra II
02058	Particular Topics in Algebra

Trigonometry

02103	Trigonometry
02105	Trigonometry/Math Analysis
02106	Trigonometry/Algebra
02107	Trigonometry/Analytic Geometry

Other advanced math

02104	Math Analysis
02108	Math Analysis/Analytic Geometry
02057	Algebra III
02061	Integrated Math—multi-year equivalent
02101	Number Theory
02102	Discrete Mathematics
02109	Elementary Functions
02111	Linear Algebra
02112	Linear Programming
02113	Abstract Algebra
02149	Analytic Mathematics—Other

Probability and statistics

02201	Probability and Statistics
02202	Inferential Probability and Statistics
02204	Particular Topics in Probability and Statistics
02207	Probability and Statistics—Independent Study
02209	Probability and Statistics—Other

Continued.

Table A-5. Categories and School Courses for the Exchange of Data (SCED) subject codes for highest level of mathematics—Continued

Other AP/IB math

02131	IB Mathematical Studies
02133	IB Mathematics and Computing—SL
02203	AP Statistics

Precalculus

02110	Precalculus
02132	IB Mathematics

Calculus

02121	Calculus
02122	Multivariate Calculus
02123	Differential Calculus
02126	Particular Topics in Calculus

AP/IB Calculus

02124	AP Calculus AB
02125	AP Calculus BC
02134	IB Further Mathematics—SL

Table A-6. Categories and School Courses for the Exchange of Data (SCED) subject codes for highest level of science

General science

03001	Earth Science
03007	Physical Geography
03008	Earth and Space Science
03009	Particular Topics in Earth Science
03047	Earth Science—Independent Study
03048	Earth Science—Workplace Experience
03049	Earth Science—Other
03158	Life Science
03159	Physical Science
03201	Integrated Science
03202	Unified Science
03203	Applied Biology/Chemistry
03204	Technological Inquiry
03205	Origins of Science
03210	Science, Technology and Society
03211	Technical Science
03212	Scientific Research and Design

Continued.

Table A-6.   Categories and School Courses for the Exchange of Data (SCED) subject codes for highest level of science—Continued

General science—Continued

03213	IB Sciences, Middle Years Program
03994	Life and Physical Sciences—Proficiency Development
03995	Life and Physical Sciences—Aide
03997	Life and Physical Sciences—Independent Study
03998	Life and Physical Sciences—Workplace Experience
03999	Life and Physical Sciences—Other
03239	Science—General
03996	Life and Physical Sciences—Supplemental
03051	Biology
03062	Conceptual Biology
03101	Chemistry
03105	Conceptual Chemistry
03151	Physics
03161	Conceptual Physics

Specialty science

03002	Geology
03003	Environmental Science
03004	Astronomy
03005	Marine Science
03006	Meteorology
03209	Aerospace
03053	Anatomy and Physiology
03054	Anatomy
03055	Physiology
03058	Botany
03059	Genetics
03060	Microbiology
03061	Zoology
03063	Particular Topics in Biology
03097	Biology—Independent Study
03098	Biology—Workplace Experience
03099	Biology—Other
03103	Organic Chemistry
03104	Physical Chemistry
03108	Particular Topics in Chemistry
03147	Chemistry—Independent Study
03148	Chemistry—Workplace Experience
03149	Chemistry—Other
03153	Principles of Technology

Continued.

Table A-6. **Categories and School Courses for the Exchange of Data (SCED) subject codes for highest level of science—Continued**

Specialty science—Continued

03162	Particular Topics in Physics
03197	Physics—Independent Study
03198	Physics—Workplace Experience
03199	Physics—Other

Advanced studies science

03052	Biology—Advanced Studies
03102	Chemistry—Advanced Studies
03152	Physics—Advanced Studies

AP/IB science

03206	IB Design Technology
03207	AP Environmental Science
03208	IB Environmental Science
03056	AP Biology
03057	IB Biology
03106	AP Chemistry
03107	IB Chemistry
03155	AP Physics B
03156	AP Physics C
03157	IB Physics
03160	IB Physical Science
03163	AP Physics C: Electricity and Magnetism
03164	AP Physics C: Mechanics
03165	AP Physics 1
03166	AP Physics 2

Credits Earned in Computer and Information Sciences and in Engineering and Technology (X3TCREDCOMPSCI, X3TCREDENGIN)

Credit variables are based on high school transcripts and standardized to Carnegie units. Courses in computer and information sciences have a two-digit SCED subject code of 10, and engineering and technology courses have a two-digit SCED subject code of 21. The percentage of respondents with any credit in these areas counts any course with nonzero credit. In the current report, the average credit earned is calculated for students with a nonzero amount of credit.

Credits Earned in Advanced Placement (AP) and International Baccalaureate (IB) Math, Science, and All Courses (X3TCREDAPMTH, X3TCREDAPSCI, X3TCREDAPIB)

Credit variables are based on high school transcripts and standardized to Carnegie units. AP and IB courses in mathematics, science, and all courses are identified in SCED by unique codes (as well as course titles with "AP" and "IB"). IB Middle Years Program courses, which are typically completed by tenth grade, are not included in the sum of credits earned. The percentage of respondents with any credit in these areas counts any course with nonzero credit. In the current report, the average credit earned is calculated for students with a nonzero amount of credit.

Dual-Enrollment Credits Earned (T3SCREDTYP)

The measures of dual-enrollment credits earned overall and in math, science, and other (non-math, non-science) subjects are based on course-level data from transcripts. Dual-enrollment credits are identified by a credit type variable (T3SCREDTYP) directly coded from transcripts. Only courses in which credit was earned for both high school and college (T3SCREDTYP=3) were included. Math and science courses were identified by their two-digit SCED subject codes (02, 03). Students were also asked about their dual-enrollment coursetaking in S3DUALMATH, S3DUALSCIENCE, and S3DUALOTHER (these student-level variables were not used in this report).

Total Credits, Credits in Precalculus or Calculus, and Credits in AP/IB Science, by State-Representative Sample (X3TCREDTOT, X3CONTROL, X1STATESAMPL)

Credit variables are based on high school transcripts and standardized to Carnegie units. Total credits include all courses. Precalculus and calculus courses are identified in table A-5 and AP/IB science courses are identified in table A-6, as presented above, and coded directly from the course-level transcript data file. The national public school sample is identified by X3CONTROL, and state-representative samples by X1STATESAMPL.

A.11.3 Postsecondary Education and Work

Immediate Postsecondary Plans (X3CLGANDWORK)

Immediate postsecondary plans were categorized from a composite variable describing whether the respondent was planning to take or taking postsecondary classes, planning to work or working (including apprenticeships), or undecided about their immediate postsecondary plans on November 1, 2013.

Postsecondary Education Program (X3PROGLEVEL)

Respondents who indicated they were attending or planned to attend a postsecondary institution on November 1, 2013 were asked what type of program they were attending or planned to attend (X3PROGLEVEL, based on S3PROGLEVEL). The two associate's degree responses ("University transfer associate's degree program," "Other associate's degree program") were combined into one category.

Postsecondary Education Application/Registration Process (X3CLASSES, S3CLGAPPNUM, S3APPSTATUS1, S3APPSTATUS2)

Respondents were asked a set of questions about whether they were taking or planned to take postsecondary classes (X3CLASSES), the number (if any) of postsecondary institutions to which they had applied or at which they had registered (S3CLGAPPNUM), and the application status of up to two schools to which they had applied but were not attending (S3APPSTATUS1 and S3APPSTATUS2). These variables were used together to construct an indicator of the key steps in the postsecondary education pipeline that students had completed.

STEM Majors (S3FIELD_STEM)

Respondents who were attending or planning to attend a postsecondary institution (and not attending high school or taking a GED course) were asked to identify the major field of study being considered. The 2013 Update questionnaire included an interactive application that allowed coding using the NCES 2010 Classification of Instructional Programs (CIP) taxonomy, a set of codes for defining postsecondary education programs. On the restricted-use data file, researchers will find both a two-digit version and a six-digit version of the CIP code (S3FIELD2 and S3FIELD6). Only the two-digit version of these variables appear on the public-use data file. These majors were coded into STEM or non-STEM based on the classification used for the National Science Foundation SMART grant program, and they include majors in mathematics, science, computer science, and engineering and related technologies.

Current Work Experiences (S3CURWORK, S3CURJOBFT, S3CURJOBHRS, X3EARNPERHR1)

In addition to asking about planned or existing activities on November 1, 2013, respondents were asked about their current (at the time they completed the questionnaire) work experiences. Work status is defined jointly by general current work status (S3CURWORK) and work intensity (full-time/part-time) if working (S3CURJOBFT). The number of hours worked per week was directly asked of respondents (S3CURJOBHRS). Earnings per hour (X3EARNPERHR1) is a composite variable created based on respondents' reports of periodicity of pay (e.g., monthly, weekly, hourly) and their typical pay amount for that period.

Appendix B: Standard Error Tables

Table B-1.

Standard errors for Figure 1 and Table 1: High school completion status of fall 2009 ninth-graders: 2013

Characteristic	Received high school diploma	Received GED or other equivalency	Enrolled in high school	Dropped out
Total	**0.50**	**0.22**	**0.29**	**0.32**
Sex				
Female	0.63	0.29	0.34	0.42
Male	0.67	0.32	0.42	0.42
Race/ethnicity				
Asian, non-Hispanic	1.50	0.74	0.29	1.27
Black, non-Hispanic	1.58	0.88	1.12	1.02
Hispanic or Latino	1.29	0.47	0.72	0.90
White, non-Hispanic	0.50	0.26	0.32	0.24
More than one race, non-Hispanic	1.56	0.71	1.00	0.69
All other races, non-Hispanic	6.19	1.52	3.27	5.71
Socioeconomic status quintile				
Lowest quintile	1.28	0.60	0.87	0.79
Middle three quintiles	0.55	0.30	0.33	0.37
Highest quintile	0.40	0.25	0.27	0.20

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSLS:09), First Follow-up and 2013 Update Public-Use File.

Table B-2.

Standard errors for Table 2: Average high school credits earned and grade point average (GPA) of fall 2009 ninth-graders, by course type and student, family, and school characteristics: 2013

Characteristic	Credits				GPA	
	Total	Academic	CTE	Other	Total	Academic
Total	**0.15**	**0.12**	**0.05**	**0.05**	**0.02**	**0.02**
Sex						
Female	0.17	0.14	0.06	0.06	0.02	0.02
Male	0.18	0.14	0.06	0.06	0.02	0.02
Race/ethnicity						
Asian, non-Hispanic	0.54	0.43	0.24	0.20	0.04	0.04
Black, non-Hispanic	0.42	0.29	0.13	0.12	0.04	0.04
Hispanic or Latino	0.30	0.25	0.10	0.11	0.04	0.03
White, non-Hispanic	0.15	0.12	0.07	0.06	0.02	0.02
More than one race, non-Hispanic	0.38	0.30	0.12	0.09	0.04	0.04
All other races, non-Hispanic	0.87	0.77	0.38	0.29	0.13	0.13
Socioeconomic status quintile						
Lowest fifth	0.26	0.20	0.09	0.08	0.03	0.03
Middle three fifths	0.18	0.14	0.06	0.06	0.02	0.02
Highest fifth	0.18	0.16	0.07	0.08	0.02	0.02
Parent's highest education						
Less than high school	0.43	0.34	0.13	0.14	0.05	0.05
High school	0.21	0.16	0.08	0.07	0.02	0.02
Associate's degree	0.23	0.16	0.09	0.08	0.02	0.02
Bachelor's degree	0.20	0.17	0.07	0.07	0.02	0.02
Master's degree or higher	0.18	0.16	0.08	0.08	0.02	0.03
Mathematics achievement quintile (2012)						
Lowest fifth	0.32	0.22	0.10	0.10	0.03	0.03
Middle three fifths	0.17	0.14	0.06	0.06	0.02	0.02
Highest fifth	0.18	0.15	0.08	0.08	0.02	0.02
School sector						
Public, 2009 and 2012	0.17	0.14	0.06	0.06	0.02	0.02
Private, 2009 and 2012	0.34	0.35	0.08	0.27	0.03	0.03
Changed sectors, 2009 to 2012	0.61	0.41	0.15	0.29	0.07	0.08

NOTE: Estimates include ninth-graders who dropped out or did not obtain a high school credential by 2013. Academic courses refer to those in English, mathematics, science, social sciences, fine arts, and foreign language. CTE refers to career and technical education. Other refers to physical education, religion, and military studies.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSLS:09), First Follow-up and High School Transcript Study Public-Use File.

Table B-3.

Standard errors for Table 3: Average high school credits earned by fall 2009 ninth-graders, by academic subject area, student, family, and school characteristics: 2013

Characteristic	STEM areas					Non-STEM academic areas				
	STEM total	Math	Science	Computer and information sciences	Engineer-ing and technology	Non-STEM total	English	Social Studies	Foreign Lang-uage	Fine arts
Total	**0.06**	**0.03**	**0.03**	**0.02**	**0.01**	**0.08**	**0.03**	**0.03**	**0.04**	**0.04**
Sex										
Female	0.06	0.03	0.03	0.02	0.01	0.09	0.03	0.04	0.04	0.05
Male	0.07	0.04	0.03	0.03	0.02	0.09	0.03	0.03	0.04	0.04
Race/ethnicity										
Asian, non-Hispanic	0.22	0.10	0.13	0.06	0.03	0.26	0.09	0.11	0.15	0.09
Black, non-Hispanic	0.14	0.07	0.05	0.05	0.03	0.19	0.09	0.07	0.06	0.07
Hispanic or Latino	0.11	0.06	0.06	0.03	0.03	0.17	0.05	0.06	0.06	0.07
White, non-Hispanic	0.06	0.03	0.03	0.02	0.01	0.08	0.03	0.03	0.03	0.04
More than one race, non-Hispanic	0.12	0.06	0.06	0.04	0.02	0.20	0.07	0.07	0.09	0.09
All other races, non-Hispanic	0.35	0.21	0.14	0.07	0.04	0.50	0.23	0.24	0.15	0.17
Socioeconomic status quintile										
Lowest fifth	0.10	0.05	0.05	0.04	0.02	0.13	0.06	0.05	0.05	0.05
Middle three fifths	0.06	0.03	0.03	0.02	0.01	0.09	0.03	0.04	0.04	0.04
Highest fifth	0.08	0.04	0.04	0.02	0.02	0.11	0.04	0.04	0.05	0.07
Parent's highest education										
Less than high school	0.17	0.08	0.09	0.05	0.02	0.21	0.08	0.09	0.08	0.08
High school	0.08	0.04	0.04	0.02	0.02	0.11	0.04	0.04	0.05	0.04
Associate's degree	0.08	0.04	0.03	0.03	0.03	0.11	0.05	0.04	0.04	0.05
Bachelor's degree	0.08	0.04	0.04	0.02	0.02	0.11	0.04	0.04	0.04	0.06
Master's degree or higher	0.09	0.04	0.05	0.03	0.02	0.11	0.03	0.04	0.05	0.08
Mathematics achievement quintile (2012)										
Lowest fifth	0.11	0.06	0.05	0.03	0.03	0.14	0.07	0.05	0.04	0.05
Middle three fifths	0.06	0.03	0.03	0.02	0.01	0.09	0.03	0.04	0.04	0.04
Highest fifth	0.08	0.04	0.04	0.03	0.02	0.10	0.03	0.04	0.05	0.07
School sector										
Public, 2009 and 2012	0.06	0.03	0.03	0.02	0.01	0.09	0.03	0.03	0.04	0.03
Private, 2009 and 2012	0.11	0.05	0.06	0.05	0.02	0.28	0.08	0.08	0.10	0.19
Changed sectors, 2009 to 2012	0.21	0.08	0.12	0.06	0.03	0.28	0.11	0.11	0.15	0.18

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSLS:09), First Follow-up and High School Transcript Study Public-Use File.

Table B-4.

Standard errors for Table 4: Percentage of fall 2009 ninth-graders by highest mathematics course in which high school credit was earned, student, family, school characteristics, and ninth-grade mathematics course: 2013

Characteristic	No math	Below algebra I	Algebra I	Geometry	Algebra II	Other math	Precalculus	Calculus
Total	**0.17**	**0.23**	**0.40**	**0.61**	**0.93**	**0.97**	**0.56**	**0.68**
Sex								
Female	0.22	0.30	0.44	0.73	1.16	1.08	0.71	0.90
Male	0.20	0.34	0.63	0.79	1.04	1.10	0.73	0.72
Race/ethnicity								
Asian, non-Hispanic	0.59	0.14	0.78	1.33	1.71	3.21	2.38	3.86
Black, non-Hispanic	0.82	0.96	1.05	1.17	2.49	2.52	1.54	1.22
Hispanic or Latino	0.34	0.48	0.91	1.60	2.04	2.27	1.17	1.33
White, non-Hispanic	0.16	0.26	0.42	0.63	1.01	0.95	0.72	0.78
More than one race, non-Hispanic	0.55	0.66	1.47	1.41	2.10	2.11	1.49	1.34
All other races, non-Hispanic	2.59	2.74	1.67	3.73	6.87	5.43	3.37	5.26
Socioeconomic status quintile								
Lowest fifth	0.52	0.64	1.16	1.59	1.96	1.70	1.46	1.04
Middle three fifths	0.22	0.27	0.47	0.68	1.09	1.16	0.66	0.71
Highest fifth	0.21	0.33	0.20	0.62	0.91	1.16	1.15	1.38
Parent's highest education								
Less than high school	0.76	1.19	2.06	2.91	2.98	2.05	1.55	2.12
High school	0.34	0.42	0.65	0.96	1.25	1.37	0.86	0.63
Associate's degree	0.42	0.32	0.69	0.94	1.86	1.52	1.06	0.91
Bachelor's degree	0.20	0.23	0.43	0.83	1.01	1.36	1.01	1.15
Master's degree or higher	0.27	0.42	0.47	0.61	1.04	1.42	1.36	1.46
Mathematics achievement quintile (2012)								
Lowest fifth	0.73	0.80	1.56	1.58	2.02	2.14	1.27	0.38
Middle three fifths	0.15	0.28	0.37	0.72	1.08	1.15	0.73	0.50
Highest fifth	0.00		0.23	0.42	0.90	1.00	1.40	1.68
School sector								
Public, 2009 and 2012	0.18	0.25	0.43	0.66	1.01	1.03	0.61	0.71
Private, 2009 and 2012	0.27	0.31	0.54	0.67	1.61	2.30	2.39	2.75
Changed sectors, 2009 to 2012	0.30	1.51	1.96	2.36	3.56	6.62	3.10	3.17
Ninth-grade math course								
Below algebra I	1.18	1.45	1.56	2.09	2.07	1.49	0.74	0.49
Algebra I	†	†	0.59	0.77	1.49	1.45	0.96	0.55
Geometry or above	†	†	†	0.87	0.79	1.28	1.09	1.36

† Not applicable.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSLS:09), First Follow-up and High School Transcript Study Public-Use File.

Table B-5.

Standard errors for Table 5: Average total high school credits earned and percentage earning any advanced mathematics or science credit for fall 2009 ninth-graders (public school students only), in the nation and in states with state-representative data: 2013

State	Average total credits	Percent earning precalculus or calculus credit	Percent earning AP or IB science credit
National, public schools only	**0.17**	**0.86**	**0.75**
California	0.54	3.19	2.61
Florida	0.43	3.58	3.54
Georgia	0.80	3.15	3.15
Michigan	0.51	3.30	2.46
North Carolina	0.59	4.15	3.93
Ohio	0.88	4.38	3.01
Pennsylvania	0.66	3.50	3.23
Tennessee	0.72	2.86	1.57
Texas	0.49	3.93	3.52
Washington	0.61	2.98	5.86

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSLS:09), First Follow-up and High School Transcript Study Restricted-Use File.

Table B-6.

Standard errors for Table 6: Percentage of fall 2009 ninth-graders by highest science course in which high school credit was earned, student, family, school characteristics, and ninth-grade science course: 2013

Characteristic	No science	General science	Specialty science	Advanced studies	AP or IB science
Total	**0.26**	**1.00**	**0.92**	**0.54**	**0.70**
Sex					
Female	0.29	1.22	1.12	0.65	0.84
Male	0.34	1.19	1.10	0.56	0.78
Race/ethnicity					
Asian, non-Hispanic	0.62	2.95	2.37	2.73	3.44
Black, non-Hispanic	0.68	2.86	2.60	0.76	1.24
Hispanic or Latino	0.65	2.08	2.17	0.98	1.16
White, non-Hispanic	0.22	1.17	1.13	0.66	0.83
More than one race, non-Hispanic	0.80	2.17	2.15	0.75	1.27
All other races, non-Hispanic	2.46	8.31	8.88	0.89	1.90
Socioeconomic status quintile					
Lowest fifth	0.66	1.89	1.70	0.78	0.88
Middle three fifths	0.37	1.15	1.04	0.56	0.74
Highest fifth	0.20	1.39	1.34	0.82	1.32
Parent's highest education					
Less than high school	1.48	3.39	2.87	1.42	1.51
High school	0.45	1.36	1.46	0.59	0.76
Associate's degree	0.45	1.52	1.44	0.74	0.80
Bachelor's degree	0.32	1.44	1.31	0.74	1.21
Master's degree or higher	0.22	1.59	1.54	0.86	1.44
Mathematics achievement quintile (2012)					
Lowest fifth	0.81	2.01	1.82	0.41	0.45
Middle three fifths	0.32	1.11	1.18	0.64	0.63
Highest fifth	0.18	1.52	1.37	0.90	1.63
School sector					
Public, 2009 and 2012	0.28	1.07	0.97	0.58	0.75
Private, 2009 and 2012	0.02	4.18	3.61	1.14	2.24
Changed sectors, 2009 to 2012	0.84	5.69	5.03	1.60	3.50
Ninth-grade science course					
Physical science or basic biology	2.37	2.51	2.33	0.55	1.33
Biology	†	1.06	1.01	0.48	0.75
Chemistry, physics, or advanced biology	†	†	5.14	3.96	3.69

† Not applicable.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSLS:09), First Follow-up and High School Transcript Study Public-Use File.

Table B-7.

Standard errors for Table 7: Average high school credits earned in technology-related courses, and percentage earning any credit, for fall 2009 ninth-graders, by student, family, and school characteristics: 2013

Characteristic	Computer and information sciences		Engineering and technology	
	Average credits	Earned any credit	Average credits	Earned any credit
Total	**0.02**	**1.65**	**0.04**	**0.86**
Sex				
Female	0.02	1.74	0.06	0.93
Male	0.02	1.87	0.05	1.04
Race/ethnicity				
Asian, non-Hispanic	0.08	3.36	0.09	2.60
Black, non-Hispanic	0.05	3.29	0.14	1.73
Hispanic or Latino	0.04	3.01	0.18	2.01
White, non-Hispanic	0.02	1.79	0.04	0.84
More than one race, non-Hispanic	0.05	2.42	0.08	1.62
All other races, non-Hispanic	0.14	7.33	0.29	4.07
Socioeconomic status quintile				
Lowest fifth	0.04	2.66	0.12	1.58
Middle three fifths	0.02	1.68	0.05	0.93
Highest fifth	0.03	2.16	0.05	1.10
Parent's highest education				
Less than high school	0.06	3.34	0.09	2.11
High school	0.02	1.97	0.06	1.17
Associate's degree	0.03	2.32	0.10	1.45
Bachelor's degree	0.03	1.93	0.06	1.11
Master's degree or higher	0.03	2.14	0.06	1.15
Mathematics achievement quintile (2012)				
Lowest fifth	0.03	2.45	0.15	1.41
Middle three fifths	0.02	1.71	0.05	0.95
Highest fifth	0.03	2.05	0.07	1.20
School sector				
Public, 2009 and 2012	0.02	1.70	0.05	0.93
Private, 2009 and 2012	0.03	5.21	0.05	1.86
Changed sectors, 2009 to 2012	0.13	5.13	0.18	2.68

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSLS:09), First Follow-up and High School Transcript Study Public-Use File.

Table B-8.

Standard errors for Table 8: Average high school credits earned and percentage of fall 2009 ninth-graders earning any credit in Advanced Placement (AP) and International Baccalaureate (IB) courses, by student, family, and school characteristics: 2013

Characteristic	Math		Science		Total AP/IB credits	
	Average AP/IB credit earned	Percent earning any AP/IB credit	Average AP/IB credit earned	Percent earning any AP/IB credit	Average AP/IB credit earned	Percent earning any AP/IB credit
Total	**0.02**	**0.76**	**0.02**	**0.70**	**0.08**	**1.20**
Sex						
Female	0.02	0.89	0.03	0.84	0.08	1.48
Male	0.03	0.80	0.03	0.78	0.10	1.20
Race/ethnicity						
Asian, non-Hispanic	0.06	3.90	0.07	3.44	0.22	3.87
Black, non-Hispanic	0.05	1.20	0.07	1.23	0.21	1.86
Hispanic or Latino	0.04	1.54	0.06	1.17	0.19	2.39
White, non-Hispanic	0.02	0.81	0.03	0.83	0.08	1.29
More than one race, non-Hispanic	0.05	1.54	0.06	1.27	0.16	2.22
All other races, non-Hispanic	0.25	5.27	0.17	1.90	0.99	6.95
Socioeconomic status quintile						
Lowest fifth	0.06	1.07	0.07	0.88	0.19	1.80
Middle three fifths	0.02	0.74	0.03	0.74	0.09	1.25
Highest fifth	0.02	1.43	0.03	1.32	0.10	1.44
Parent's highest education						
Less than high school	0.12	2.10	0.16	1.51	0.37	2.67
High school	0.03	0.79	0.04	0.76	0.11	1.46
Associate's degree	0.04	0.93	0.06	0.80	0.13	1.41
Bachelor's degree	0.03	1.24	0.04	1.21	0.10	1.54
Master's degree or higher	0.03	1.49	0.04	1.43	0.12	1.66
Mathematics achievement quintile (2012)						
Lowest fifth	0.14	0.18	0.25	0.45	0.21	1.19
Middle three fifths	0.02	0.56	0.03	0.63	0.08	1.18
Highest fifth	0.03	1.87	0.03	1.63	0.11	1.64
School sector						
Public, 2009 and 2012	0.02	0.82	0.02	0.75	0.08	1.30
Private, 2009 and 2012	0.03	2.86	0.06	2.24	0.14	3.42
Changed sectors, 2009 to 2012	0.08	2.88	0.13	3.50	0.28	5.12

NOTE: IB Middle Years Program courses are not included; see appendix A, section A.11.2, for more information.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSLS:09), First Follow-up and High School Transcript Study Public-Use File.

Table B-9.

Standard errors for Table 9: Percentage of fall 2009 ninth-graders earning high school credit in dual enrollment courses, by student, family, and school characteristics: 2013

Characteristic	Any dual-enrollment credit	Dual enrollment in math, science, and other subjects		
		Dual-enrollment math credit	Dual-enrollment science credit	Dual-enrollment credit in all other subjects
Total	**0.92**	**0.46**	**0.31**	**0.83**
Sex				
Female	1.06	0.56	0.33	0.99
Male	0.90	0.45	0.38	0.79
Race/ethnicity				
Asian, non-Hispanic	3.00	2.37	0.90	2.25
Black, non-Hispanic	1.69	0.52	0.10	1.64
Hispanic or Latino	1.10	0.56	0.53	1.10
White, non-Hispanic	1.25	0.63	0.50	1.14
More than one race, non-Hispanic	1.39	0.69	0.32	1.28
All other races, non-Hispanic	1.84	0.12	0.24	1.84
Socioeconomic status quintile				
Lowest fifth	0.99	0.50	0.19	0.92
Middle three fifths	0.92	0.45	0.36	0.86
Highest fifth	1.51	0.86	0.67	1.31
Parent's highest education				
Less than high school	1.54	0.76	0.24	1.34
High school	0.87	0.45	0.29	0.82
Associate's degree	1.06	0.48	0.42	1.04
Bachelor's degree	1.34	0.78	0.55	1.29
Master's degree or higher	1.47	0.85	0.69	1.27
Mathematics achievement quintile (2012)				
Lowest fifth	0.70	0.29	†	0.64
Middle three fifths	0.90	0.45	0.26	0.85
Highest fifth	1.68	1.04	0.95	1.49
School sector				
Public, 2009 and 2012	0.98	0.49	0.33	0.89
Private, 2009 and 2012	2.43	0.85	0.94	2.38
Changed sectors, 2009 to 2012	1.62	0.73	1.11	1.46

† Not applicable.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSLS:09), First Follow-up and High School Transcript Study Restricted-Use File.

Table B-10.
Standard errors for Figure 2 and Table 10: Postsecondary education and work plans or status of fall 2009 ninth-graders, by student and family characteristics: November 1, 2013

Characteristic	Taking postsecondary classes, not working	Working for pay, not taking postsecondary classes	Both taking classes and working	Neither taking classes nor working	Undecided
Total	**0.74**	**0.60**	**0.51**	**0.27**	**0.55**
Sex					
Female	0.95	0.78	0.65	0.40	0.80
Male	0.91	0.78	0.82	0.33	0.84
Race/ethnicity					
Asian, non-Hispanic	2.30	3.24	1.02	1.02	3.03
Black, non-Hispanic	1.88	1.49	1.46	1.05	1.99
Hispanic or Latino	1.54	1.04	1.33	0.87	1.30
White, non-Hispanic	0.82	0.71	0.60	0.28	0.60
More than one race, non-Hispanic	2.72	1.53	1.60	0.79	2.15
All other races, non-Hispanic	5.79	4.95	2.97	2.73	6.22
Socioeconomic status quintile					
Lowest quintile	1.52	0.95	1.23	0.78	1.46
Middle three quintiles	0.96	0.66	0.65	0.37	0.62
Highest quintile	1.16	1.23	0.48	0.31	0.93

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSLS:09), First Follow-up and 2013 Update Public-Use File.

Table B-11.

Standard errors for Figure 3: Percentage of high school completers from the fall 2009 ninth-grade class who applied to, registered at, were accepted by, and were taking or planning to take postsecondary classes in November 2013

Group	Percent
All completers	0.00
Did not applied to or register at a postsecondary institution	0.55
Applied to or registered at a postsecondary institution	0.55
Not accepted (or wait-listed)	0.28
Accepted or registered	0.68
Not taking postsecondary classes	0.45
Taking postsecondary classes	0.83

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSLS:09), First Follow-up and 2013 Update Public Use-File.

Table B-12.
Standard errors for Table 11: Percentage of fall 2009 ninth-graders who were pursuing or planning to pursue selected postsecondary degree, among those who were taking or planning to take postsecondary classes, by student, family, and school characteristics: 2013

Characteristic	Bachelor's degree program	Associate's degree program	Diploma program for occupational training	No specific program	Other/ don't know
Total	**0.96**	**0.69**	**0.39**	**0.41**	**0.56**
Sex					
Female	1.14	0.92	0.42	0.59	0.70
Male	1.24	0.99	0.63	0.53	0.87
Race/ethnicity					
Asian, non-Hispanic	3.39	2.75	0.69	1.62	1.94
Black, non-Hispanic	2.56	2.36	1.03	1.19	2.25
Hispanic or Latino	1.63	2.03	1.17	1.17	1.87
White, non-Hispanic	1.05	0.93	0.40	0.40	0.46
More than one race, non-Hispanic	2.56	2.54	1.45	1.81	1.74
All other races, non-Hispanic	7.12	6.38	6.11	2.29	7.80
Socioeconomic status quintile					
Lowest fifth	2.12	2.11	1.34	1.14	2.50
Middle three fifths	1.06	0.92	0.47	0.59	0.63
Highest fifth	1.27	0.99	0.42	0.48	0.63
Parent's highest education					
Less than high school	3.16	3.30	2.67	2.31	4.71
High school	1.41	1.38	0.72	0.99	1.28
Associate's degree	1.44	1.66	0.90	0.84	1.33
Bachelor's degree	1.42	1.30	0.39	0.55	0.71
Master's degree or higher	1.65	1.36	0.52	0.67	0.83
Mathematics achievement quintile (2012)					
Lowest fifth	1.73	2.38	1.66	1.77	2.31
Middle three fifths	1.04	1.02	0.44	0.51	0.69
Highest fifth	1.45	1.20	0.19	0.63	0.78
School sector					
Public, 2009 and 2012	1.05	0.74	0.43	0.45	0.62
Private, 2009 and 2012	2.52	1.99	0.78	0.79	1.14
Changed sectors, 2009 to 2012	5.38	3.77	1.24	1.72	3.07

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSLS:09), First Follow-up and 2013 Update Public-Use File.

Table B-13.

Standard errors for Table 12: Percentage of fall 2009 ninth-graders considering a science, technology, engineering, or math (STEM) major, by level of program and student, family, and school characteristics: 2013

Characteristic	Overall	Postsecondary program		
		Bachelor's degree program	Associate's degree program	Other program
Total	**0.74**	**1.03**	**0.97**	**1.31**
Sex				
Female	0.86	1.28	0.83	1.19
Male	1.18	1.71	1.86	2.46
Race/ethnicity				
Asian, non-Hispanic	3.26	3.57	5.36	7.10
Black, non-Hispanic	1.72	4.05	2.67	2.97
Hispanic or Latino	1.78	4.32	1.88	3.73
White, non-Hispanic	0.73	1.01	1.32	1.55
More than one race, non-Hispanic	2.26	3.77	2.89	3.04
All other races, non-Hispanic	7.97	13.70	16.14	8.42
Socioeconomic status quintile				
Lowest fifth	2.10	4.79	2.86	2.94
Middle three fifths	0.83	1.45	1.22	1.85
Highest fifth	1.27	1.48	2.15	3.27
Parent's highest education				
Less than high school	3.66	10.38	4.01	5.30
High school	1.26	2.32	1.60	2.17
Associate's degree	1.56	3.03	1.91	3.80
Bachelor's degree	1.31	1.66	2.19	2.79
Master's degree or higher	1.41	1.82	2.20	2.79
Mathematics achievement quintile (2012)				
Lowest fifth	1.54	4.82	2.14	3.15
Middle three fifths	0.71	1.15	1.06	1.62
Highest fifth	1.66	1.62	3.10	4.30
School sector				
Public, 2009 and 2012	0.81	1.15	1.02	1.39
Private, 2009 and 2012	1.32	1.58	3.36	2.91
Changed sectors, 2009 to 2012	4.70	7.92	6.25	6.16

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSLS:09), First Follow-up and 2013 Update Public-Use File.

Table B-14.

Standard errors for Table 13: Percentage of fall 2009 ninth-graders with current work status, and average hours and wages among those working, by student, family, and school characteristics: 2013

Characteristic	Current work status			Among those working	
	Working full time	Working part time	Not working	Average hours worked	Average hourly wage
Total	**0.75**	**0.54**	**0.68**	**0.23**	**0.064**
Sex					
Female	1.04	0.57	0.92	0.24	0.071
Male	1.01	0.82	0.94	0.33	0.085
Race/ethnicity					
Asian, non-Hispanic	2.35	1.14	1.85	0.97	0.957
Black, non-Hispanic	1.63	1.37	1.32	0.71	0.171
Hispanic or Latino	2.14	1.25	1.52	0.51	0.118
White, non-Hispanic	0.86	0.66	0.87	0.28	0.070
More than one race, non-Hispanic	2.31	1.54	2.30	0.84	0.219
All other races, non-Hispanic	6.92	3.51	6.18	2.39	0.431
Socioeconomic status quintile					
Lowest fifth	1.51	1.35	1.31	0.67	0.121
Middle three fifths	1.00	0.71	0.92	0.27	0.073
Highest fifth	1.26	0.82	1.21	0.38	0.122
Parent's highest education					
Less than high school	3.14	2.37	2.47	1.10	0.151
High school	1.34	0.95	1.09	0.37	0.105
Associate's degree	1.69	0.96	1.49	0.42	0.098
Bachelor's degree	1.35	0.86	1.25	0.36	0.116
Master's degree or higher	1.54	0.95	1.51	0.43	0.123
Mathematics achievement quintile (2012)					
Lowest fifth	1.50	1.24	1.33	0.53	0.130
Middle three fifths	0.89	0.65	0.88	0.27	0.077
Highest fifth	1.32	0.78	1.27	0.36	0.097
School sector					
Public, 2009 and 2012	0.81	0.58	0.73	0.24	0.068
Private, 2009 and 2012	2.08	1.15	1.67	0.60	0.205
Changed sectors, 2009 to 2012	5.61	2.62	5.74	1.47	0.487

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSLS:09), First Follow-up and 2013 Update Public-Use File.