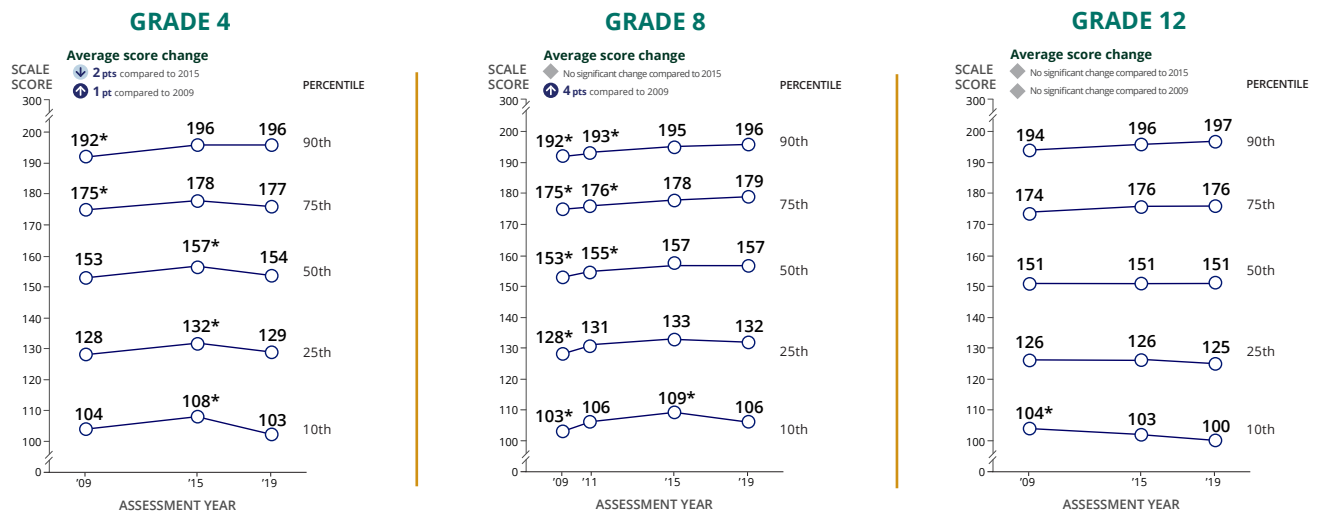


# Results from the 2019 Science Assessment at grades 4, 8, and 12

## AVERAGE SCORES AND PERCENTILES

Average science scores decrease at grade 4; no significant changes at grade 8 or grade 12 compared to 2015

- Scores decrease for lowest-performing students at grades 4 and 8 compared to 2015
- Average scores higher at grades 4 and 8 compared to 2009; no significant score change at grade 12

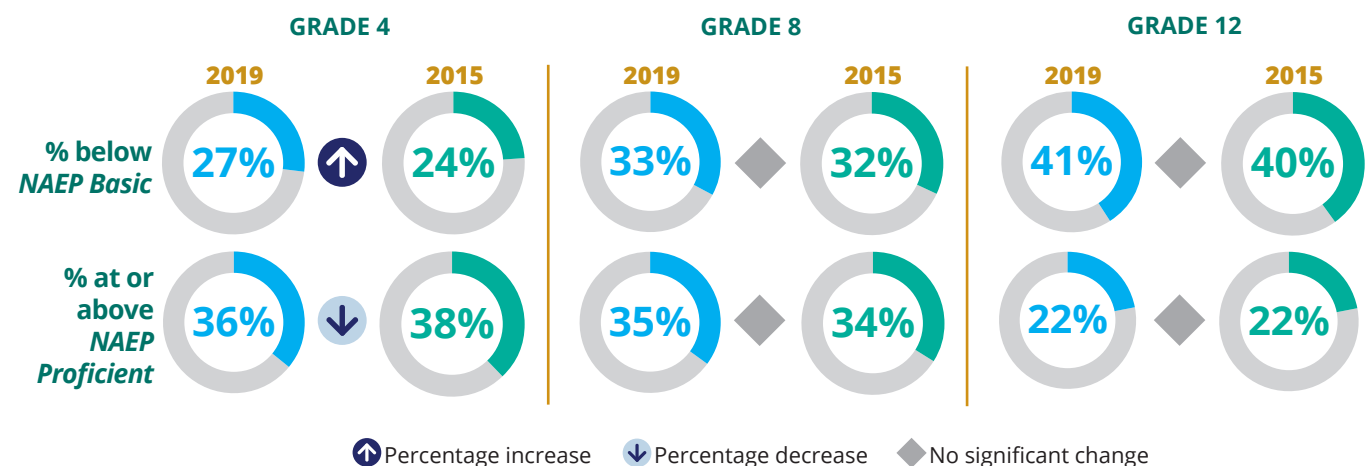


\*Significantly different ( $p < .05$ ) from 2019.

## NAEP ACHIEVEMENT-LEVEL RESULTS

Approximately 30% of fourth- and eighth-graders and about 40% of twelfth-graders score below *NAEP Basic* in 2019

- Approximately one-third of fourth- and eighth-graders and less than one-quarter of twelfth-graders score at or above *NAEP Proficient* in 2019
- At fourth grade, a lower percentage of students score at or above *NAEP Proficient* and a higher percentage score below *NAEP Basic* compared to 2015



## AVERAGE SCORES BY CONTENT AREA

### Lower average scores for fourth-graders in two of the three science content areas compared to 2015

- Scores decline for lower-performing fourth-graders in all three content areas compared to 2015

	PHYSICAL SCIENCE			LIFE SCIENCE			EARTH AND SPACE SCIENCES		
		2019 SCORE	2019 COMPARED TO 2015	2019 SCORE	2019 COMPARED TO 2015	2019 COMPARED TO 2009	2019 SCORE	2019 COMPARED TO 2015	2019 COMPARED TO 2009
GRADE 4	AVERAGE SCORE	153	◆	◆	◆	◆	152	◆	◆
	PERCENTILES								
	90th	197	◆	◆	◆	◆	196	◆	◆
	75th	178	◆	◆	◆	◆	177	◆	◆
	50th	155	◆	◆	◆	◆	154	◆	◆
	25th	130	◆	◆	◆	◆	129	◆	◆
10th	104	◆	◆	◆	◆	105	◆	◆	

◆ Score increase  
◆ Score decrease  
◆ No significant change

### Scores decline for lowest-performing eighth-graders in all three content areas compared to 2015; scores increase for higher-performing students in two content areas

- No significant changes in average content area scores for eighth-graders compared to 2015

	PHYSICAL SCIENCE			LIFE SCIENCE			EARTH AND SPACE SCIENCES		
		2019 SCORE	2019 COMPARED TO 2015	2019 SCORE	2019 COMPARED TO 2015	2019 COMPARED TO 2009	2019 SCORE	2019 COMPARED TO 2015	2019 COMPARED TO 2009
GRADE 8	AVERAGE SCORE	154	◆	◆	◆	◆	151	◆	◆
	PERCENTILES								
	90th	196	◆	◆	◆	◆	194	◆	◆
	75th	178	◆	◆	◆	◆	176	◆	◆
	50th	156	◆	◆	◆	◆	155	◆	◆
	25th	131	◆	◆	◆	◆	129	◆	◆
10th	106	◆	◆	◆	◆	103	◆	◆	

◆ Score increase  
◆ Score decrease  
◆ No significant change

### Scores decline for lowest-performing twelfth-grade students in two content areas compared to 2015

- No significant changes in average content area scores for twelfth-graders compared to 2015 or 2009

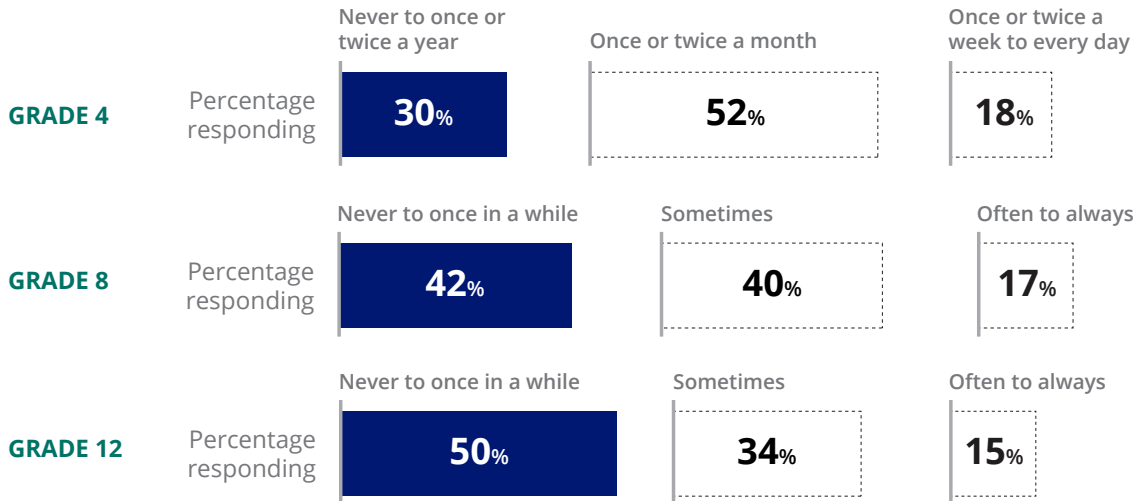
	PHYSICAL SCIENCE			LIFE SCIENCE			EARTH AND SPACE SCIENCES		
		2019 SCORE	2019 COMPARED TO 2015	2019 SCORE	2019 COMPARED TO 2015	2019 COMPARED TO 2009	2019 SCORE	2019 COMPARED TO 2015	2019 COMPARED TO 2009
GRADE 12	AVERAGE SCORE	149	◆	◆	◆	◆	150	◆	◆
	PERCENTILES								
	90th	196	◆	◆	◆	◆	195	◆	◆
	75th	174	◆	◆	◆	◆	175	◆	◆
	50th	149	◆	◆	◆	◆	152	◆	◆
	25th	124	◆	◆	◆	◆	127	◆	◆
10th	101	◆	◆	◆	◆	104	◆	◆	

◆ Score increase  
◆ Score decrease  
◆ No significant change

## SCIENTIFIC INQUIRY-RELATED CLASSROOM ACTIVITIES

Approximately one-third to fifty percent of students across the three grades rarely engage in scientific inquiry-related classroom activities in 2019

- At all three grades, students who engage less frequently in scientific inquiry-related classroom activities generally score lower on average in 2019 than students who participate more frequently



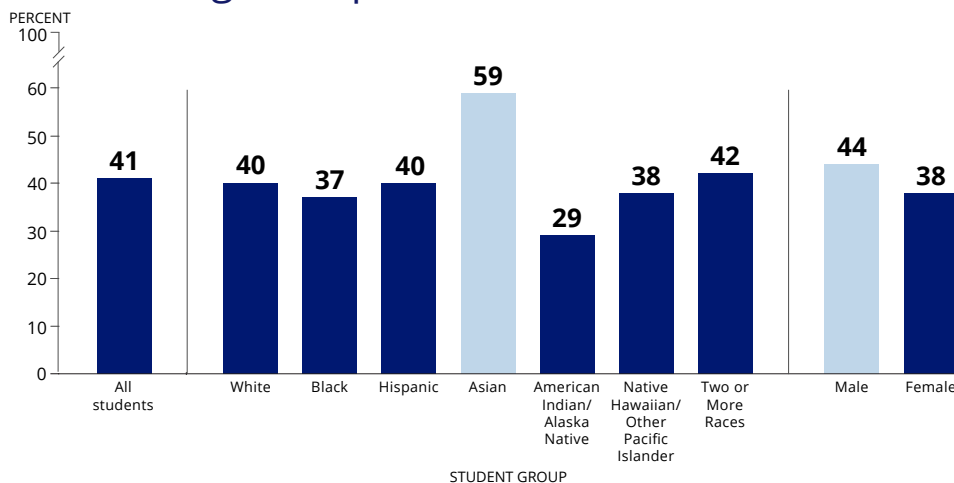
## COURSETAKING IN SCIENCE AT GRADE 12

Forty-one percent of twelfth-graders report having taken courses in biology, chemistry, and physics since eighth grade

- Students who report taking courses in biology, chemistry, and physics score higher on average in 2019 than students who report taking biology and chemistry and students who report taking biology only or other science courses



A larger percentage of Asian and male twelfth-grade students have taken courses in biology, chemistry, and physics since eighth grade compared to their racial/ethnic or gender peers



## STUDENT PERFORMANCE ACROSS NAEP SUBJECTS

Higher-performers improved at grades 4 and 8 across subjects, while scores for higher-performers did not significantly change at grade 12 compared to 2009

- Lowest-performers' scores decreased in reading and mathematics across all three grades; scores decreased for lowest-performers in science at grade 12

Reporting metric			2019 score compared to 2009		
			Science	Reading	Mathematics
GRADE 4	AVERAGE SCALE SCORE CHANGE		↑	◆	◆
	PERCENTILE SCORE CHANGE	90th	↑	↑	↑
		75th	↑	↑	↑
		50th	◆	↑	◆
		25th	◆	↓	◆
		10th	◆	↓	↓
GRADE 8	AVERAGE SCALE SCORE CHANGE		↑	◆	◆
	PERCENTILE SCORE CHANGE	90th	↑	↑	↑
		75th	↑	↑	◆
		50th	↑	◆	↓
		25th	↑	↓	↓
		10th	↑	↓	↓
GRADE 12	AVERAGE SCALE SCORE CHANGE		◆	↓	↓
	PERCENTILE SCORE CHANGE	90th	◆	◆	◆
		75th	◆	◆	◆
		50th	◆	↓	↓
		25th	◆	↓	↓
		10th	↓	↓	↓

↑ Score increase   
 ↓ Score decrease   
 ◆ No significant change

NOTE: The NAEP science scale ranges from 0 to 300. In 2019, the digitally based NAEP science assessment was administered for the first time. The 2019 science report includes results from students who took the digitally based assessment and students who took the paper-based assessment. The 2009, 2011, 2015, and 2019 NAEP science assessments were based on a new science framework introduced in 2009, which replaced the one used for the 1996, 2000, and 2005 assessments. The 2009 framework started a new NAEP science trend line so the results from the 2009, 2011, 2015, and 2019 assessments cannot be compared to those from previous assessment years. The 2011 NAEP science assessment for grade 8 was a special administration to permit comparisons with the Trends in International Mathematics and Science Study (TIMSS). Detail may not sum to totals because of rounding or the omission of categories. Although the estimates (e.g., average scores or percentages) are shown as rounded numbers in the charts, the positions of the data points in the graphics are based on the unrounded numbers. Unrounded numbers were used for calculating the differences between the estimates, and for the statistical comparison test when the estimates were compared to each other. Not all apparent differences between estimates are statistically significant.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), various years, 2009–2019 Science Assessments.