



2017 NAEP Reading and Mathematics: Summary of State Results

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I. Executive Summary of the 2017 NAEP State Results in Reading and Mathematics

Fifty states took part in the 2017 state administration of the National Assessment of Educational Progress (NAEP) reading and mathematics assessments at grades 4 and 8. In Massachusetts, grade 4 students from 194 schools and grade 8 students from 168 schools participated in the 2017 NAEP state assessments; 6,500 students were assessed in reading, and 6,600 students were assessed in mathematics. This report provides state-level results for the reading and mathematics assessments. The 2017 test administration is the first for which results were reported from assessments administered on laptops provided by NAEP.

□ **Interpreting this Report**

When reviewing this report, it is important to keep in mind that the NAEP results are based on a *sample* of students across Massachusetts and not on the *population* of Massachusetts students. In analyzing the results, tests of significance were used to determine differences in the data that could be confidently characterized as *not occurring by chance*. This type of difference is commonly referred to as a statistically *significant* difference. In the report's tables, an asterisk is used to denote a value that is significantly different from the value for the nation's public schools.

□ **Overall Performance for Reading**

Massachusetts tied for first place on the grades 4 and 8 NAEP reading assessments.

- Based on average scale scores, Massachusetts tied for first in the nation at grade 4 with one other state. At grade 8, Massachusetts tied for first in the nation with two other states.
- In reading at grade 4, the percentage of Massachusetts students scoring at or above the *Proficient* level was higher than the percentage of students at or above the *Proficient* level in 48 states and no different from the percentage of students at or above the *Proficient* level in one state. At grade 8, the percentage of Massachusetts students scoring at or above the *Proficient* level in reading was higher than the percentage of students at or above the *Proficient* level in 47 states and no different from the percentage of students at or above the *Proficient* level in two states.

Students in Massachusetts outperformed students nationally on the NAEP reading tests.

- The average scale score of Massachusetts grade 4 students on the reading assessment was 236, higher than the national average of 221. Eighth-grade Massachusetts students also outscored their counterparts nationwide 278 to 265.
- Fifty-one percent of Massachusetts grade 4 students and 49 percent of grade 8 students scored at or above the *Proficient* level. These percentages were higher than the comparable percentages of students nationally who scored at or above the *Proficient* level, which was 35 percent at both grades 4 and 8.

□ **Overall Performance for Mathematics**

On the NAEP mathematics assessments, Massachusetts tied for first with five other states at grade 4 and one other state on grade 8.

- In mathematics at grade 4, the percentage of Massachusetts students scoring at or above the *Proficient* level was higher than the percentage of students at or above the *Proficient* level in 44 states and no different from the percentage of students at or above the *Proficient* level in five states. At grade 8, the percentage of Massachusetts students scoring at or above the *Proficient* level in mathematics was higher than the percentage of students at or above the *Proficient* level in 47 states and no different from the percentage of students at or above the *Proficient* level in two states.

Students in Massachusetts outperformed students nationally on the NAEP mathematics tests.

- The average scale score of Massachusetts grade 4 students on the mathematics assessment was 249, higher than the national average of 239. Eighth-grade Massachusetts students also outscored their counterparts nationwide 297 to 282.
- Fifty-three percent of Massachusetts grade 4 students and 50 percent of grade 8 students scored at or above the *Proficient* level. These percentages were higher than the comparable percentages of students nationally who scored at or above the *Proficient* level (40 percent at grade 4 and 33 percent at grade 8).

□ **Students Performing at or above the *Proficient* level in the Top Performing States**

The following table lists the top-performing states on the 2017 reading and mathematics assessments according to the ordinal rank of the percentage of students in each state who scored at or above the *Proficient* level.

**Table 1. 2017 NAEP Reading Assessment
Percentage of Students at or above *Proficient* in the Top 10 States**

Grade 4		Grade 8	
Massachusetts	51	Massachusetts	49
New Jersey	49	New Jersey	47
New Hampshire	43	New Hampshire	45
Vermont	43	Vermont	45
Virginia	43	Connecticut	44
Connecticut	43	Washington	42
Wyoming	41	Indiana	41
Utah	41	Colorado	41
Florida	41	Pennsylvania	40
Indiana	41	Wisconsin	39

**Table 2. 2017 NAEP Mathematics Assessment
Percentage of Students at or above *Proficient* in the Top 10 States**

Grade 4		Grade 8	
Massachusetts	53	Massachusetts	50
Minnesota	53	Minnesota	46
Wyoming	51	New Hampshire	45
Virginia	50	New Jersey	44
New Jersey	50	Washington	41
Nebraska	49	Nebraska	41
Indiana	48	Virginia	40
New Hampshire	48	Ohio	40
Florida	48	North Dakota	40
North Dakota	46	Vermont	39

- **Student Subgroup Performance in Reading in Massachusetts Compared to the Nation in 2017**
 - Race/Ethnicity: At grade 4, African American/Black, Asian, Hispanic, and White students in Massachusetts outperformed their counterparts nationally. At grade 8, Asian and White students outperformed their counterparts nationally. The performance of Massachusetts Hispanic and African/Black students at grade 8 did not differ significantly from the performance of their counterparts nationally.
 - Gender: At grades 4 and 8, both female and male students in Massachusetts outscored their counterparts nationally.
 - Student Status: At grades 4 and 8, students with disabilities and students eligible for free or reduced-price lunch in Massachusetts outscored their counterparts nationally. English language learner students in Massachusetts at grade 4 scored significantly higher than their counterparts in the nation, while at grade 8 there was no significant difference.

- **Student Subgroup Performance in Mathematics in Massachusetts Compared to the Nation in 2017**
 - Race/Ethnicity: At grade 4, White and Hispanic students in Massachusetts outperformed their counterparts nationally, while African American/Black and White students did not differ significantly from the performance of their counterparts nationally. At grade 8, the performance of Massachusetts African American/Black, White, Hispanic, and Asian students outperformed their counterparts nationally.
 - Gender: At grades 4 and 8, both female and male students in Massachusetts outscored their counterparts nationally.
 - Student Status: At both grades 4 and 8, students with disabilities and students eligible for free or reduced-price lunch in Massachusetts outscored their counterparts nationally. However, there was no significant difference between the performance of English language learner students in Massachusetts and the national average at both grades.

II. Background Information on the 2017 NAEP Reading and Mathematics Assessments

Participation in NAEP state assessments in reading and mathematics at grades 4 and 8 is mandated by the Every Student Succeeds Act (ESSA). Students from 50 states participated in the 2017 NAEP state assessments in reading and mathematics. Across the nation, roughly 280,000 fourth- and eighth-grade students were assessed in reading, and 284,000 fourth- and eighth-grade students were assessed in mathematics.

□ Test Content of the Reading Assessment

The 2017 NAEP reading framework approved by the National Assessment Governing Board carries forward changes that were made in 2009 to include more emphasis on literary and informational texts, a redefinition of reading cognitive processes, a systemic assessment of vocabulary knowledge, and the addition of poetry at grade 4. Results from special analyses conducted in 2009 determined that, even with these changes to the assessment, results could continue to be compared to those from earlier assessment years.

**Table 3. 2017 NAEP Reading Assessment
Distribution of Questions by Cognitive Skill across the Test**

Field of Reading	Grade 4	Grade 8
Locate and Recall: When locating or recalling information from what they have read, students may identify explicitly stated main ideas or may focus on specific elements of a story.	30%	20%
Integrate and Interpret: When integrating and interpreting what they have read, students may make comparisons, explain character motivation, or examine relations of ideas across the text.	50%	50%
Critique and Evaluate: When critiquing or evaluating what they have read, students view the text critically by examining it from numerous perspectives or may evaluate overall text quality or the effectiveness of particular aspects of the text.	20%	30%

□ **Test Content of the Mathematics Assessment**

The 2017 NAEP mathematics framework approved by the National Assessment Governing Board specifies that each question on the assessment measure one of five mathematical content areas. Although the names of the content areas, as well as some of the topics in those areas, have changed over the years, there has been a consistent focus across frameworks on collecting information about students’ performance in the following five areas: number properties and operations; measurement; geometry; data analysis, statistics, and probability; and algebra.

**Table 4. 2017 NAEP Mathematics Assessment
Distribution of Questions By Content Area Across the Test**

Field of Mathematics	Grade 4	Grade 8
Number properties and operations measures students’ understanding of ways to represent, calculate, and estimate with numbers.	40%	20%
Measurement assesses students’ knowledge of units of measurement for such attributes as capacity, length, area, volume, time, angles, and rates.	20%	15%
Geometry measures students’ knowledge and understanding of shapes in two and three dimensions, and relationships between shapes such as symmetry and transformations.	15%	20%
Data analysis, statistics, and probability measures students’ understanding of data representation, characteristics of data sets, experiments and samples, and probability.	10%	15%
Algebra measures students’ understanding of patterns, using variables, algebraic representation, and functions.	15%	30%

□ **Types of Questions on the Reading and Mathematics Assessments**

The NAEP reading and mathematics assessments contained three types of questions or items: multiple-choice, short constructed-response, and extended constructed-response.

□ **Student Participation**

Each student selected for NAEP participates in only one subject-area test, and he/she takes only a portion of the entire test in that subject. For instance, a student chosen for the 2017 reading or mathematics test took two 25-minute blocks, or sets of test items, out of a total of 10+ blocks of items at that grade level.

NAEP spirals blocks of items into different test “booklets,” administers them to representative samples of students, and combines the results in order to produce average scale scores for the entire group and for subgroups of student populations. This approach reduces the burden on each individual student.

□ **Reporting**

Student performance on NAEP is indicated in two ways—scale scores and achievement levels. The NAEP reading and mathematics assessment scales range from 0 to 500. Performance for each grade is scaled separately, so average scale scores cannot be compared across grades.

Achievement levels are used to describe expectations for student performance according to a set of standards for what students should know and be able to do. The three achievement levels are *Basic*, *Proficient*, and *Advanced*.

- ***Basic*** denotes partial mastery of prerequisite knowledge and skills that are fundamental for proficient work at a given grade. Examples of skills demonstrated by students performing at the *Basic* level include the following:
 - In Reading, fourth-grade students should be able to locate relevant information, make simple inferences, and use their understanding of the text to identify details that support a given interpretation or conclusion. Students should be able to interpret the meaning of a word as it is used in the text.
 - In Reading, eighth-grade students should be able to locate information; identify statements of main idea, theme, or author’s purpose; and make simple inferences from texts. They should be able to interpret the meaning of a word as it is used in the text. Students performing at this level should also be able to state judgments and give some support about content and presentation content.
 - In Mathematics, fourth-grade students should show some evidence of understanding the mathematical concepts and procedures in the five NAEP content areas.
 - In Mathematics, eighth-grade students should exhibit evidence of conceptual and procedural understanding in the five NAEP content areas. This level of performance

signifies an understanding of arithmetic operations—including estimation—on whole numbers, decimals, fractions, and percents.

- ***Proficient*** represents solid academic performance. Students reaching this level have demonstrated competency over challenging subject matter. Examples of skills demonstrated by students performing at the *Proficient* level include the following:
 - In Reading, fourth-grade students should be able to integrate and interpret texts and apply their understanding of the text to draw conclusions and make evaluations.
 - In Reading, eighth-grade students should be able to provide relevant information and summarize main ideas and themes. They should be able to make and support inferences about a text, connect parts of a text, and analyze text features. Students performing at this level should also be able to fully substantiate judgments about content and presentation of content.
 - In Mathematics, fourth-grade students should consistently apply integrated procedural knowledge and conceptual understanding to problem solving in the five NAEP content areas.
 - In Mathematics, eighth-grade students should apply mathematical concepts and procedures consistently to complex problems in the five NAEP content areas.

- ***Advanced*** represents superior performance. Examples of skills demonstrated by students performing at the *Advanced* level include the following:
 - In Reading, fourth-grade students should be able to make complex inferences and construct and support their inferential understanding of the text. Students should be able to apply their understanding of a text to make and support a judgment.
 - In Reading, eighth-grade students should be able to make connections within and across texts and to explain causal relations. They should be able to evaluate and justify the strength of supporting evidence and the quality of an author’s presentation. Students performing at the *Advanced* level should be able to manage the processing demands of analysis and evaluation by stating, explaining, and justifying.
 - In Mathematics, fourth-grade students should apply integrated procedural knowledge and conceptual understanding to complex and non-routine real-world problem solving in the five NAEP content areas.
 - In Mathematics, eighth-grade students should be able to reach beyond the recognition, identification, and application of mathematical rules in order to generalize and synthesize concepts and principles in the five NAEP content areas.

III. 2017 NAEP Reading and Mathematics Results by Subgroup

Student performance data are reported for public school students in Massachusetts and the nation according to the following demographic characteristics:

- race/ethnicity
- gender
- student eligibility for the National School Lunch Program
- type of school location
- parents' highest level of education

Results for each of the characteristics are reported in tables that include the percentage of students in each subgroup in the first column. The columns to the right show the average scale score and the percentage of students at each achievement level.

The reader is cautioned against making causal inferences about subgroup differences, as a complex mix of educational and socioeconomic factors may affect student performance.

□ Race/Ethnicity

The race/ethnicity of each student was reported by the schools. The next four tables show reading and mathematics average scale scores, achievement-level data, and population percentages for public school students at grades 4 and 8 in Massachusetts and the nation by race/ethnicity.

**Table 5-A. 2017 NAEP Reading Assessment:
Grade 4 Performance by Race/Ethnicity**

Race/Ethnicity		Percentage of Students	Average Scale Score	Percentage of Students			
				Below Basic	At or Above Basic	At or Above Proficient	At Advanced
White							
	Nation	47	231	22	78	46	12
	Massachusetts	60	243	13	87	60	21
African American/Black							
	Nation	15	205	50	50	19	3
	Massachusetts	9	219	36	64	29	6
Hispanic							
	Nation	27	208	46	54	22	4
	Massachusetts	20	217	38	62	29	5
Asian/Pacific Islander							
	Nation	6	238	18	82	56	21
	Massachusetts	7	247	14	86	64	25

**Table 5-B. 2017 NAEP Reading Assessment:
Grade 8 Performance by Race/Ethnicity**

				Percentage of Students			
Race/Ethnicity		Percentage of Students	Average Scale Score	Below Basic	At or Above Basic	At or Above Proficient	At Advanced
White							
	Nation	50	274	17	83	44	5
	Massachusetts	66	283	11	89	55	10
African American/Black							
	Nation	15	248	41	59	17	1
	Massachusetts	8	258	31	69	26	2
Hispanic							
	Nation	25	255	34	66	22	1
	Massachusetts	16	259	30	70	28	3
Asian/Pacific Islander							
	Nation	6	281	15	85	54	11
	Massachusetts	7	292	7	93	66	15

**Table 6-A. 2017 NAEP Mathematics Assessment:
Grade 4 Performance by Race/Ethnicity**

				Percentage of Students			
Race/Ethnicity		Percentage of Students	Average Scale Score	Below Basic	At or Above Basic	At or Above Proficient	At Advanced
White							
	Nation	47	248	12	88	51	11
	Massachusetts	60	255	8	92	62	16
African American/Black							
	Nation	15	223	37	63	19	2
	Massachusetts	10	229	29	71	25	2
Hispanic							
	Nation	27	229	30	70	26	3
	Massachusetts	19	234	23	77	31	4
Asian/Pacific Islander							
	Nation	6	258	10	90	64	24
	Massachusetts	7	262	7	93	68	28

**Table 6-B. 2017 NAEP Mathematics Assessment:
Grade 8 Performance by Race/Ethnicity**

Race/ethnicity		Percentage of Students	Average Scale Score	Percentage of Students			
				Below Basic	At or Above Basic	At or Above Proficient	At Advanced
White							
	Nation	50	292	20	80	43	13
	Massachusetts	65	303	13	87	56	20
African American/Black							
	Nation	15	260	54	46	13	2
	Massachusetts	8	271	41	59	22	3
Hispanic							
	Nation	25	268	43	57	20	3
	Massachusetts	16	274	39	61	29	7
Asian/Pacific Islander							
	Nation	6	310	14	86	62	30
	Massachusetts	7	323	8	92	72	43

□ **Gender**

Information on student gender is reported by the student’s school when rosters of the students eligible to be assessed are submitted to NAEP. The next four tables show reading and mathematics average scale scores, achievement-level data, and population percentages for public school students at grades 4 and 8 in Massachusetts and the nation by gender.

**Table 7-A. 2017 NAEP Reading Assessment:
Grade 4 Performance by Gender**

Gender		Percentage of Students	Average Scale Score	Percentage of Students			
				Below Basic	At or Above Basic	At or Above Proficient	At Advanced
Male							
	Nation	51	218	36	64	33	8
	Massachusetts	50	233	23	77	48	15
Female							
	Nation	49	224	30	70	38	10
	Massachusetts	50	239	18	82	54	19

**Table 7-B. 2017 NAEP Reading Assessment:
Grade 8 Performance by Gender**

				Percentage of Students			
Gender		Percentage of Students	Average Scale Score	Below Basic	At or Above Basic	At or Above Proficient	At Advanced
Male							
	Nation	51	260	29	71	30	3
	Massachusetts	50	273	18	82	44	6
Female							
	Nation	49	270	20	80	40	5
	Massachusetts	50	282	12	88	55	11

**Table 8-A. 2017 NAEP Mathematics Assessment:
Grade 4 Performance by Gender**

				Percentage of Students			
Gender		Percentage of Students	Average Scale Score	Below Basic	At or Above Basic	At or Above Proficient	At Advanced
Male							
	Nation	51	240	21	79	41	9
	Massachusetts	51	252	11	89	56	15
Female							
	Nation	49	238	21	79	38	7
	Massachusetts	49	247	14	86	50	11

**Table 8-B. 2017 NAEP Mathematics Assessment:
Grade 8 Performance by Gender**

				Percentage of Students			
Gender		Percentage of Students	Average Scale Score	Below Basic	At or Above Basic	At or Above Proficient	At Advanced
Male							
	Nation	51	282	31	69	34	11
	Massachusetts	50	296	20	80	49	18
Female							
	Nation	49	282	31	69	33	9
	Massachusetts	50	298	18	82	51	18

□ **Free/Reduced-Price Lunch**

NAEP collects data on student eligibility for the federal program providing free or reduced-price school lunches. The free/reduced-price lunch component of the National School Lunch Program (NSLP) offered through the U.S. Department of Agriculture (USDA) is designed to ensure that children near or below the poverty line receive nourishing meals. Eligibility is determined through the USDA’s Income Eligibility Guidelines and is included as an indicator of lower family income. The following four tables show average scale scores, achievement-level data, and population percentages for public school students at grades 4 and 8 in Massachusetts and the nation by eligibility for the NSLP.

**Table 9-A. 2017 NAEP Reading Assessment:
Grade 4 Performance by Free/Reduced-Price Lunch Eligibility**

Eligibility Status		Percentage of Students	Average Scale Score	Percentage of Students			
				Below Basic	At or Above Basic	At or Above Proficient	At Advanced
Eligible							
	Nation	54	208	46	54	22	3
	Massachusetts	31	219	35	65	30	6
Not Eligible							
	Nation	45	236	18	82	52	15
	Massachusetts	68	243	14	86	60	22

**Table 9-B. 2017 NAEP Reading Assessment:
Grade 8 Performance by Free/Reduced Price-Lunch Eligibility**

Eligibility Status		Percentage of Students	Average Scale Score	Percentage of Students			
				Below Basic	At or Above Basic	At or Above Proficient	At Advanced
Eligible							
	Nation	49	253	36	64	21	1
	Massachusetts	25	257	31	69	25	2
Not Eligible							
	Nation	50	277	14	86	48	7
	Massachusetts	74	285	9	91	58	11

**Table 10-A. 2017 NAEP Mathematics Assessment:
Grade 4 Performance by Free/Reduced-Price Lunch Eligibility**

				Percentage of Students			
Eligibility Status		Percentage of Students	Average Scale Score	Below Basic	At or Above Basic	At or Above Proficient	At Advanced
Eligible							
	Nation	54	228	31	69	25	3
	Massachusetts	31	232	25	75	29	3
Not Eligible							
	Nation	45	253	9	91	57	14
	Massachusetts	68	257	7	93	64	18

**Table 10-B. 2017 NAEP Mathematics Assessment:
Grade 8 Performance by Free/Reduced-Price Lunch Eligibility**

				Percentage of Students			
Eligibility Status		Percentage of Students	Average Scale Score	Below Basic	At or Above Basic	At or Above Proficient	At Advanced
Eligible							
	Nation	49	267	45	55	18	3
	Massachusetts	25	278	33	67	28	7
Not Eligible							
	Nation	50	297	17	83	48	16
	Massachusetts	73	305	13	87	58	22

□ **Students with Disabilities and/or English Language Learners**

To ensure that samples are representative, NAEP has established policies and procedures to maximize the inclusion of all students in the assessment. Every effort is made to ensure that all selected students who are capable of participating meaningfully in NAEP are assessed. While some students with disabilities (SD) and/or English language learner (ELL) students can be assessed without any special procedures, others require accommodations to participate. Still other SD and/or ELL students selected by NAEP may not be able to participate.

Tables 11-A, 11-B, 12-A, and 12-B show average scale scores, achievement-level data, and population percentages for public school students at grades 4 and 8 in Massachusetts and the nation by disability status. Tables 13-A, 13-B, 14-A, and 14-B show average scale scores, achievement level data, and population percentages for public school students at grades 4 and 8 in Massachusetts and the nation by ELL status.

**Table 11-A. 2017 NAEP Reading Assessment:
Grade 4 Performance by Disability Status**

Disability Status		Percentage of Students	Average Scale Score	Percentage of Students			
				Below Basic	At or Above Basic	At or Above Proficient	At Advanced
SD							
	Nation	13	186	68	32	12	2
	Massachusetts	18	209	50	50	22	6
Not SD							
	Nation	87	226	28	72	39	10
	Massachusetts	82	242	14	86	57	19

**Table 11-B. 2017 NAEP Reading Assessment:
Grade 8 Performance by Disability Status**

Disability Status		Percentage of Students	Average Scale Score	Percentage of Students			
				Below Basic	At or Above Basic	At or Above Proficient	At Advanced
SD							
	Nation	13	231	62	38	9	1
	Massachusetts	18	249	40	60	18	1
Not SD							
	Nation	87	270	19	81	38	4
	Massachusetts	82	284	10	90	56	10

**Table 12-A. 2017 NAEP Mathematics Assessment:
Grade 4 Performance by Disability Status**

Disability Status		Percentage of Students	Average Scale Score	Percentage of Students			
				Below Basic	At or Above Basic	At or Above Proficient	At Advanced
SD							
	Nation	13	214	52	48	16	2
	Massachusetts	18	225	36	64	22	3
Not SD							
	Nation	87	243	16	84	43	9
	Massachusetts	82	254	8	92	60	16

**Table 12-B. 2017 NAEP Mathematics Assessment:
Grade 8 Performance by Disability Status**

				Percentage of Students			
Disability Status		Percentage of Students	Average Scale Score	Below Basic	At or Above Basic	At or Above Proficient	At Advanced
SD							
	Nation	13	246	70	30	8	2
	Massachusetts	18	263	51	49	16	3
Not SD							
	Nation	87	287	25	75	37	11
	Massachusetts	82	304	12	88	57	21

**Table 13-A. NAEP 2017 Reading Assessment:
Grade 4 Performance by ELL Status**

				Percentage of Students			
ELL Status		Percentage of Students	Average Scale Score	Below Basic	At or Above Basic	At or Above Proficient	At Advanced
ELL							
	Nation	12	189	68	32	9	1
	Massachusetts	9	201	58	42	14	2
Not ELL							
	Nation	88	225	29	71	39	10
	Massachusetts	91	239	16	84	54	18

**Table 13-B. NAEP 2017 Reading Assessment:
Grade 8 Performance by ELL Status**

				Percentage of Students			
ELL Status		Percentage of Students	Average Scale Score	Below Basic	At or Above Basic	At or Above Proficient	At Advanced
ELL							
	Nation	6	226	68	32	5	#
	Massachusetts	6	228	63	37	6	#
Not ELL							
	Nation	94	268	22	78	37	4
	Massachusetts	94	281	12	88	52	9

Rounds to zero

**Table 14-A. NAEP 2017 Mathematics Assessment:
Grade 4 Performance by ELL Status**

				Percentage of Students			
ELL Status		Percentage of Students	Average Scale Score	Below Basic	At or Above Basic	At or Above Proficient	At Advanced
ELL							
	Nation	12	217	47	53	14	2
	Massachusetts	10	222	39	61	17	2
Not ELL							
	Nation	88	242	18	82	43	9
	Massachusetts	90	252	10	90	57	14

**Table 14-B. NAEP 2017 Mathematics Assessment:
Grade 8 Performance by ELL Status**

				Percentage of Students			
ELL Status		Percentage of Students	Average Scale Score	Below Basic	At or Above Basic	At or Above Proficient	At Advanced
ELL							
	Nation	6	245	72	28	6	1
	Massachusetts	6	250	65	35	9	2
Not ELL							
	Nation	94	284	28	72	35	10
	Massachusetts	94	300	16	84	52	19

IV. 2017 NAEP Reading and Mathematics Results by School Location

Schools that participated in the assessment were classified as being located in four mutually exclusive types of communities: city, suburb, town, and rural. These categories indicate the geographic locations of schools. The following four tables show average scale scores, achievement-level data, and population percentages for public school students at grades 4 and 8 in Massachusetts and the nation, by type of location.

**Table 15-A. NAEP 2017 Reading Assessment:
Grade 4 Performance by School Location**

				Percentage of Students			
Location		Percentage of Students	Average Scale Score	Below Basic	At or Above Basic	At or Above Proficient	At Advanced
City							
	Nation	30	215	40	60	30	7
	Massachusetts	18	223	33	67	37	10
Suburb							
	Nation	40	226	28	72	41	11
	Massachusetts	73	238	18	82	54	19
Town							
	Nation	11	216	38	62	30	6
	Massachusetts	2	‡	‡	‡	‡	‡
Rural							
	Nation	19	222	31	69	35	8
	Massachusetts	8	239	14	86	52	17

‡ Reporting standards not met

**Table 15-B. NAEP 2017 Reading Assessment:
Grade 8 Performance by School Location**

				Percentage of Students			
Location		Percentage of Students	Average Scale Score	Below Basic	At or Above Basic	At or Above Proficient	At Advanced
City							
	Nation	29	260	30	70	30	3
	Massachusetts	14	264	26	74	34	4
Suburb							
	Nation	40	270	21	79	40	5
	Massachusetts	74	280	13	87	52	10
Town							
	Nation	11	262	27	73	30	3
	Massachusetts	2	‡	‡	‡	‡	‡
Rural							
	Nation	19	265	24	76	33	3
	Massachusetts	10	283	11	89	56	10

‡ Reporting standards not met

**Table 16-A. NAEP 2017 Mathematics Assessment:
Grade 4 Performance by School Location**

				Percentage of Students			
Location		Percentage of Students	Average Scale Score	Below Basic	At or Above Basic	At or Above Proficient	At Advanced
City							
	Nation	30	234	27	73	33	7
	Massachusetts	18	237	21	79	35	6
Suburb							
	Nation	40	243	18	82	45	10
	Massachusetts	73	251	12	88	56	15
Town							
	Nation	11	237	21	79	36	6
	Massachusetts	2	‡	‡	‡	‡	‡
Rural							
	Nation	19	240	18	82	41	7
	Massachusetts	7	256	7	93	63	17

‡ Reporting standards not met

**Table 16-B. NAEP 2017 Mathematics Assessment:
Grade 8 Performance by School Location**

				Percentage of Students			
Location		Percentage of Students	Average Scale Score	Below Basic	At or Above Basic	At or Above Proficient	At Advanced
City							
	Nation	29	277	37	63	29	9
	Massachusetts	15	285	29	71	37	11
Suburb							
	Nation	41	287	27	73	39	12
	Massachusetts	74	299	17	83	51	20
Town							
	Nation	11	278	33	67	28	6
	Massachusetts	2	‡	‡	‡	‡	‡
Rural							
	Nation	19	282	29	71	32	8
	Massachusetts	9	302	15	85	59	20

‡ Reporting standards not met

V. 2017 NAEP Reading and Mathematics Results by Parents' Level of Education

Eighth-grade students who participated in the NAEP 2017 assessment were asked to indicate the highest level of education they thought their father and mother had completed. Five response options—did not finish high school, graduated from high school, some education after high school, graduated from college, and “I don’t know”—were offered. The highest level of education reported for either parent was used in the analysis. The results by highest level of parental education are shown in tables 17 and 18. Fourth-graders were not asked about their parents’ education level because their responses in previous NAEP assessments were not reliable, and a large percentage of them chose the “I don’t know” option.

**Table 17. NAEP 2017 Reading Assessment:
Grade 8 Performance by Parents' Level of Education**

Parent Education	Percentage of Students	Average Scale Score	Percentage of Students			
			Below Basic	At or Above Basic	At or Above Proficient	At Advanced
Did Not Finish High School						
Nation	7	250	39	61	18	1
Massachusetts	4	257	26	74	21	1
Graduated High School						
Nation	14	254	35	65	21	1
Massachusetts	11	261	27	73	29	3
Graduated College						
Nation	54	275	17	83	45	6
Massachusetts	66	286	10	90	59	12

Rounds to zero

**Table 18. NAEP 2017 Mathematics Assessment:
Grade 8 Performance by Parents' Level of Education**

Parent Education	Percentage of Students	Average Scale Score	Percentage of Students			
			Below Basic	At or Above Basic	At or Above Proficient	At Advanced
Did Not Finish High School						
Nation	7	265	48	52	16	2
Massachusetts	4	277	34	66	26	6
Graduated High School						
Nation	15	266	45	55	17	3
Massachusetts	12	280	32	68	30	8
Graduated College						
Nation	53	294	21	79	45	16
Massachusetts	65	308	11	89	61	24

VI. 2017 NAEP Grade 4 Reading Achievement Level Descriptions

NAEP achievement levels are cumulative; therefore, student performance at the *Proficient* level includes the competencies associated with the *Basic* level, and the *Advanced* level also includes the skills and knowledge associated with both the *Basic* and the *Proficient* levels. The cut score indicating the lower end of the score range for each level is noted in parentheses.

Achievement Level	Description
<i>Basic</i> (208)	<p>Fourth-grade students performing at the <i>Basic</i> level should be able to locate relevant information, make simple inferences, and use their understanding of the text to identify details that support a given interpretation or conclusion. They should be able to interpret the meaning of a word as it is used in the text.</p> <p>When reading literary texts such as fiction, poetry, and literary nonfiction, fourth-grade students performing at the <i>Basic</i> level should be able to make simple inferences about characters, events, plot, and setting. They should be able to identify a problem in a story and relevant information that supports an interpretation of a text.</p> <p>When reading informational texts such as articles and excerpts from books, fourth-grade students performing at the <i>Basic</i> level should be able to identify the main purpose and an explicitly stated main idea, as well as gather information from various parts of a text to provide supporting information.</p>
<i>Proficient</i> (238)	<p>Fourth-grade students performing at the <i>Proficient</i> level should be able to integrate and interpret texts and apply their understanding of the text to draw conclusions and make evaluations.</p> <p>When reading literary texts such as fiction, poetry, and literary nonfiction, fourth-grade students performing at the <i>Proficient</i> level should be able to identify implicit main ideas and recognize relevant information that supports them. They should be able to judge elements of an author's craft and provide some support for their judgment. Students at this level should be able to analyze character roles, actions, feelings, and motivations.</p> <p>When reading informational texts such as articles and excerpts from books, fourth-grade students performing at the <i>Proficient</i> level should be able to locate relevant information, integrate information across texts, and evaluate the way an author presents information. They should demonstrate an understanding of the purpose for text features and an ability to integrate information from headings, text boxes, and graphics and their captions. Students at this level should be able to explain a simple cause-and-effect relationship and draw conclusions.</p> <p>Description</p>

<p><i>Advanced</i> (268)</p>	<p>Fourth-grade students performing at the <i>Advanced</i> level should be able to make complex inferences and construct and support their inferential understanding of the text. They should be able to apply their understanding of a text to make and support a judgment.</p> <p>When reading literary texts such as fiction, poetry, and literary nonfiction, fourth-grade students performing at the <i>Advanced</i> level should be able to identify the theme in stories and poems and make complex inferences about characters' traits, feelings, motivations, and actions. They should be able to recognize characters' perspectives and evaluate characters' motivations. Students at this level should be able to interpret characteristics of poems and evaluate aspects of text organization.</p> <p>When reading informational texts such as articles and excerpts from books, fourth-grade students performing at the <i>Advanced</i> level should be able to make complex inferences about main ideas and supporting ideas. They should be able to express a judgment about the text and about text features and support the judgments with evidence. Students at this level should be able to identify the most likely cause given an effect, explain an author's point of view, and compare ideas across two texts.</p>
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VII. 2017 NAEP Grade 8 Reading Achievement Level Descriptions

Achievement Level	Description
<i>Basic</i> (243)	<p data-bbox="500 310 1419 525">Eighth-grade students performing at the <i>Basic</i> level should be able to locate information; identify statements of main idea, theme, or author's purpose; and make simple inferences from texts. They should be able to interpret the meaning of a word as it is used in the text. Students at this level should also be able to state judgments and give some support about content and presentation of content.</p> <p data-bbox="500 562 1419 814">When reading literary texts such as fiction, poetry, and literary nonfiction, eighth-grade students performing at the <i>Basic</i> level should recognize major themes and be able to identify, describe, and make simple inferences about setting and about character motivations, traits, and experiences. They should be able to state and provide some support for judgments about the way an author presents content and about character motivation.</p> <p data-bbox="500 840 1419 1087">When reading informational texts such as exposition and argumentation, eighth-grade students performing at the <i>Basic</i> level should be able to recognize inferences based on main ideas and supporting details. They should be able to locate and provide relevant facts to construct general statements about information from the text. Students at this level should be able to provide some support for judgments about the way information is presented.</p>
<i>Proficient</i> (281)	<p data-bbox="500 1098 1419 1312">Eighth-grade students performing at the <i>Proficient</i> level should be able to provide relevant information and summarize main ideas and themes. They should be able to make and support inferences about a text, connect parts of a text, and analyze text features. Students at this level should also be able to fully substantiate judgments about content and presentation of content.</p> <p data-bbox="500 1350 1419 1644">When reading literary texts such as fiction, poetry, and literary nonfiction, eighth-grade students performing at the <i>Proficient</i> level should be able to make and support a connection between characters from two parts of a text. They should be able to recognize character actions and infer and support character feelings. Students at this level should be able to provide and support judgments about characters' motivations across texts. They should be able to identify how figurative language is used.</p> <p data-bbox="500 1669 1419 1864">When reading informational texts such as exposition and argumentation, eighth-grade students performing at the <i>Proficient</i> level should be able to locate and provide facts and relevant information that support a main idea or purpose, interpret causal relations, provide and support a judgment about the author's argument or stance, and recognize rhetorical devices.</p>

	Description
<i>Advanced</i> (323)	<p>Eighth-grade students performing at the <i>Advanced</i> level should be able to make connections within and across texts and to explain causal relations. They should be able to evaluate and justify the strength of supporting evidence and the quality of an author's presentation. Students at the <i>Advanced</i> level also should be able to manage the processing demands of analysis and evaluation by stating, explaining, and justifying.</p> <p>When reading literary texts such as fiction, literary nonfiction, and poetry, eighth-grade students performing at the <i>Advanced</i> level should be able to explain the effects of narrative events. Within or across texts, they should be able to make thematic connections and make inferences about characters' feelings, motivations, and experiences.</p> <p>When reading informational texts such as exposition and argumentation, eighth-grade students performing at the <i>Advanced</i> level should be able to infer and explain a variety of connections that are intra-textual (such as the relation between specific information and the main idea) or inter-textual (such as the relation of ideas across expository and argument texts). Within and across texts, they should be able to state and justify judgments about text features, choice of content, and the author's use of evidence and rhetorical devices.</p>

VIII. 2017 NAEP Grade 4 Mathematics Achievement Level Descriptions

Achievement Level	Description
<i>Basic</i> (214)	<p>Fourth-grade students performing at the <i>Basic</i> level should show some evidence of understanding the mathematical concepts and procedures in the five NAEP content areas.</p> <p>Fourth-graders performing at the <i>Basic</i> level should be able to estimate and use basic facts to perform simple computations with whole numbers, show some understanding of fractions and decimals, and solve some simple real-world problems in all NAEP content areas. They should be able to use—although not always accurately—four-function calculators, rulers, and geometric shapes. Their written responses are often minimal and presented without supporting information.</p>
<i>Proficient</i> (249)	<p>Fourth-grade students performing at the <i>Proficient</i> level should consistently apply integrated procedural knowledge and conceptual understanding to problem solving in the five NAEP content areas.</p> <p>Fourth-graders performing at the <i>Proficient</i> level should be able to use whole numbers to estimate, compute, and determine whether results are reasonable. They should have a conceptual understanding of fractions and decimals; be able to solve real-world problems in all NAEP content areas; and use four-function calculators, rulers, and geometric shapes appropriately. Students at this level should employ problem-solving strategies such as identifying and using appropriate information. Their written solutions should be organized and presented both with supporting information and explanations of how they were achieved.</p>
<i>Advanced</i> (282)	<p>Fourth-grade students performing at the <i>Advanced</i> level should apply integrated procedural knowledge and conceptual understanding to complex and non-routine real-world problem solving in the five NAEP content areas.</p> <p>Fourth-graders performing at the <i>Advanced</i> level should be able to solve complex and non-routine real-world problems in all NAEP content areas. They should display mastery in the use of four-function calculators, rulers, and geometric shapes. Students at this level are expected to draw logical conclusions and justify answers and solution processes by explaining why, as well as how, they were achieved. They should go beyond the obvious in their interpretations and be able to communicate their thoughts clearly and concisely.</p>

IX. 2017 NAEP Grade 8 Mathematics Achievement Level Descriptions

Achievement Level	Description
<i>Basic</i> (262)	<p data-bbox="500 306 1424 485">Eighth-grade students performing at the <i>Basic</i> level should exhibit evidence of conceptual and procedural understanding in the five NAEP content areas. This level of performance signifies an understanding of arithmetic operations—including estimation—on whole numbers, decimals, fractions, and percents.</p> <p data-bbox="500 527 1424 814">Eighth-graders performing at the <i>Basic</i> level should complete problems correctly with the help of structural prompts such as diagrams, charts, and graphs. They should be able to solve problems in all NAEP content areas through the appropriate selection and use of strategies and technological tools—including calculators, computers, and geometric shapes. Students at this level also should be able to use fundamental algebraic and informal geometric concepts in problem solving.</p> <p data-bbox="500 856 1424 1035">As they approach the <i>Proficient</i> level, students at the <i>Basic</i> level should be able to determine which of the available data are necessary and sufficient for correct solutions and use them in problem solving. However, these eighth-graders show limited skill in communicating mathematically.</p>
<i>Proficient</i> (299)	<p data-bbox="500 1079 1424 1184">Eighth-grade students performing at the <i>Proficient</i> level should apply mathematical concepts and procedures consistently to complex problems in the five NAEP content areas.</p> <p data-bbox="500 1226 1424 1472">Eighth-graders performing at the <i>Proficient</i> level should be able to conjecture, defend their ideas, and give supporting examples. They should understand the connections among fractions, percents, decimals, and other mathematical topics such as algebra and functions. Students are expected to have a thorough understanding of <i>Basic</i> level arithmetic operations—an understanding sufficient for problem solving in practical situations.</p> <p data-bbox="500 1514 1424 1864">Quantity and spatial relationships in problem solving and reasoning should be familiar to them, and they should be able to convey underlying reasoning skills beyond the level of arithmetic. They should be able to compare and contrast mathematical ideas and generate their own examples. These students should make inferences from data and graphs, apply properties of informal geometry, and accurately use the tools of technology. Students at this level should understand the process of gathering and organizing data and be able to calculate, evaluate, and communicate results within the domain of statistics and probability.</p>

<i>Advanced</i> (333)	<p>Eighth-grade students performing at the <i>Advanced</i> level should be able to reach beyond the recognition, identification, and application of mathematical rules in order to generalize and synthesize concepts and principles in the five NAEP content areas.</p> <p>Eighth-graders performing at the <i>Advanced</i> level should be able to probe examples and counterexamples in order to shape generalizations from which they can develop models. They should use number sense and geometric awareness to consider the reasonableness of an answer. Students at this level are expected to use abstract thinking to create unique problem-solving techniques and explain the reasoning processes underlying their conclusions.</p>
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NAEP Assessment Reporting Glossary

Accommodations. Accommodations are alterations in the way tasks are presented that allow children with learning disabilities to complete the same assignments as other students. Accommodations do not alter the content of assignments, give students an unfair advantage, or in the case of assessments such as NAEP, change what a test measures.

Achievement levels. Performance standards set by the National Assessment Governing Board that provide a context for interpreting student performance on NAEP, based on recommendations from panels of educators and members of the public. The levels, *Basic*, *Proficient*, and *Advanced*, measure what students should know and be able to do at each grade assessed. See each NAEP subject for a detailed description of what students should know and be able to do at each level at grade 4, 8, or 12.

- ***Basic.*** One of the three NAEP achievement levels, which denotes partial mastery of prerequisite knowledge and skills that are fundamental for proficient work at each grade assessed. NAEP also reports the proportion of students whose scores place them below the *Basic* achievement level. See each NAEP subject for a detailed description of what students should know and be able to do at grades 4, 8, or 12 at the *Basic* level. The cut scores determining each level are available with these descriptions.
- ***Proficient.*** One of the three NAEP achievement levels, which represents solid academic performance for each grade assessed. Students reaching this level have demonstrated competency over challenging subject matter, including subject-matter knowledge, application of such knowledge to real-world situations, and analytical skills appropriate to the subject matter. See each NAEP subject for a detailed description of what students should know and be able to do at grades 4, 8, or 12 at the *Proficient* level. The cut scores determining each level are available with the descriptions.
- ***Advanced.*** One of the three NAEP achievement levels, which denotes superior performance at each grade assessed. See each NAEP subject for a detailed description of what students should know and be able to do at grades 4, 8, or 12 at the *Advanced* level. The cut scores determining each level are available with these descriptions.

Achievement-level percentages. The percentage of students within the total population, or in a particular student group, who meet or exceed expectations of what students should know and be able to do. Specifically, it is the weighted percentage of students with NAEP composite scores that are equal to, or exceed, the achievement-level cut scores specified by the National Assessment Governing Board.

Gender. NAEP results are reported separately for males and females, based on students' self-reported gender.

English language learners (ELL). A term used to describe students who are in the process of acquiring English language skills and knowledge.

NAEP. The National Assessment of Educational Progress, also known as "the Nation's Report Card," is the only nationally representative and continuing assessment of what America's students know and can do in various subject areas. Since 1969, assessments have been conducted periodically in mathematics, reading, science, writing, U.S. history, geography, civics, the arts, and other subjects.

NAEP scales. The scales common across age or grade levels and assessment years used to report NAEP results.

National Assessment Governing Board. An independent organization whose members are appointed by the U.S. Secretary of Education. The Governing Board provides overall policy direction to the NAEP program. It is an independent, bipartisan group, whose members include governors, state legislators, local and state school officials, educators, business representatives, and members of the general public.

National School Lunch Program (NSLP). A federally assisted meal program that provides low-cost or free lunches to eligible students. It is sometimes referred to as the free/reduced-price lunch program. Free lunches are offered to those students whose family incomes are at or below 130 percent of the poverty level; reduced-price lunches are offered to those students whose family incomes are between 130 percent and 185 percent of the poverty level.

Parental education. A NAEP reporting group defined by the highest level of education of the mother or father of an assessed student as derived from the student's response to two background questionnaire items.

Percentile. A score location below which a specified percentage of the population falls. For example, in 1998, the tenth percentile of fourth-grade reading scores was 167. This means that in 1998, ten percent of fourth-graders had NAEP reading scores below 167, while 90 percent scored at or above 167.

Race/ethnicity. In order to allow comparisons across years, assessment results presented are based on information for six mutually exclusive racial/ethnic categories: White, Black, Hispanic, Asian/Pacific Islander, American Indian (including Alaska Native), and Other. Students who identified with more than one of the first five categories, or had a background other than those listed, were categorized as Other. In all NAEP assessments, data about student race/ethnicity is collected from two sources: school records and student self-reports. Before 2002, NAEP used students' self-reports of their race and ethnicity on a background questionnaire as the source of race/ethnicity data. In 2002, the decision was made to change the student race/ethnicity variable highlighted in NAEP reports. Since 2002, NAEP reports of students' race and ethnicity have been based on school records, with students' self-reports used only if school data are missing. Information based on student self-reported race/ethnicity will continue to be reported in the NAEP Data Explorer for assessments after 2001.

Reporting group. Groups within the national population for which NAEP data are reported; for example, gender, race/ethnicity, grade, age, level of parental education, region, and type of location.

Sample. A subset of a population whose characteristics are studied to gain information about the entire population. NAEP assesses a representative sample of students each year, rather than the entire population of students.

Sampling error. The error in survey estimates that occurs because only a sample of the population is observed. Measured by sampling standard error.

Scale score. A score derived from student responses to assessment items that summarizes the overall level of performance attained by that student. While NAEP does not produce scale scores for individual students, NAEP does produce summary statistics describing scale scores for groups of students. NAEP subject area scales typically range from 0 to 500 (reading, mathematics, U.S. history, and geography) or from 0 to 300 (science, writing, and civics).

School location. The physical location of a school. NAEP reporting includes city, suburb, town, and rural.

Significantly different, statistically significant, statistically significant difference. Statistical tests are conducted to determine whether the changes or differences between two result numbers are statistically significant. The term "significant" does not imply a judgment about the absolute magnitude or educational relevance of changes in student performance. Rather, it is used to indicate that the observed changes are not likely to be associated with sampling and measurement error, but are statistically dependable population differences. NAEP uses widely accepted statistical standards in analyzing data. For instance, this website discusses only findings that are statistically significant at the .05 level. However, some differences that are statistically significant appear small, particularly in recent assessment years, when the sample sizes have been larger.

NOTE: Differences between scale scores or percentages are calculated using unrounded values. In some instances, the result of the subtraction differs from what would be obtained by subtracting the rounded values shown in the accompanying figure or table.

Standard error. In NAEP, a measure of sampling variability and measurement error for a NAEP scale score. However, for other statistics, it reflects the sampling variability. Because of NAEP's complex student sampling design, sampling standard errors are estimated by jackknifing the samples from first-stage sample estimates. Standard errors may also include a component because of the error of measurement of individual scores estimated using plausible values.

Student sample. A portion of a population, or a subset from a set of units, that is selected by some probability mechanism for the purpose of investigating the properties of the population.

Students with disabilities (SD). A student with a disability may need specially designed instruction to meet his or her learning goals. A student with a disability will usually have an Individualized Education Plan (IEP), which guides his or her special education instruction. Students with disabilities are often referred to as special education students and may be classified by their school as learning disabled (LD) or emotionally disturbed (ED). The goal of NAEP is that students who are capable of participating meaningfully in the assessment are assessed, but

some students with disabilities selected by NAEP may not be able to participate, even with the accommodations provided.

Subject area. One of the areas assessed by NAEP: the arts, civics, economics, foreign language, geography, mathematics, reading, science, U.S. history, world history, or writing.

Weighted percentage. A percentage that has been calculated by differentially weighting observations to account for complex sampling procedures. It differs from a simple percentage in which all cases are equally weighted.

In NAEP, each sampled student is assigned a weight that makes proper allowances for the sampling design and reflects adjustments for school and student nonparticipation.

Weighted percentages are estimates of the percentages of the total population of the student group that share a specified characteristic. For example, the weighted percentage of fourth-grade students in the NAEP sample that correctly answered a particular NAEP test item is an estimate of the percentage of fourth-grade students in the nation that can correctly answer that question.