New York State Testing Program

Educator Guide to the 2023 Grades 3–8 Mathematics Tests

THE UNIVERSITY OF THE STATE OF NEW YORK

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Foreword

The information contained in this Educator Guide is designed to raise educator awareness of the structure of the 2023 New York State Grades 3–8 Mathematics Tests measuring the New York State Next Generation Mathematics Learning Standards (http://www.nysed.gov/curriculum-instruction/new-york-state-next-generation-mathematics-learning-standards).

The guide provides educators with pertinent information about the 2023 test development process, the learning standards that the tests are designed to measure, the format of the testing sessions which includes what types of questions will be asked, the estimated average length of the testing sessions, and what mathematics tools are allowable during testing. Links to additional resources are provided to further enhance educators' understanding of the structure of the mathematics tests. Educators are encouraged to review the guide prior to the test administration to gain familiarity with the test format. The information presented can also be used as a platform for educator discussion on how student assessment results can guide future instruction.

The Elementary and Intermediate testing schedule for the spring 2023 administration can be found on the website (http://www.nysed.gov/state-assessment/grades-3-8-test-schedules). Questions regarding the New York State Testing Program and test design may be addressed to the Office of State Assessment at emscassessinfo@nysed.gov. Questions regarding the New York State Learning Standards may be addressed to the Office of Curriculum and Instruction at emscurric@nysed.gov.

2023 New York State Grades 3–8 Testing Program

Purpose of State Testing

The federal Every Student Succeeds Act (2018) requires that states annually administer tests in English Language Arts (ELA) and Mathematics in grades 3–8. The Grades 3–8 ELA and Mathematics NYS Testing Program has been designed to measure student knowledge and skills as defined by the grade-level New York Next Generation Learning Standards (NGLS) in ELA and Mathematics. The Grades 3–8 state tests are designed to report student proficiency in one of four performance levels. Please refer to page 5 of this guide for further information regarding the Performance Level Descriptions.

New York State Educators Involvement in Test Development

While teachers have always been included in the Grades 3–8 Test Development Process, the New York State Education Department (NYSED) continues to expand the number of opportunities for New York State educators to become involved. This includes writing all of the test questions. New York State educators provide the critical input necessary to ensure that the tests are fair, valid, and appropriate for students through their participation in many test development activities.

The test development process includes the development, review, and approval of test questions, construction of field and operational test forms, final approval of test forms prior to administration, and the development of scoring materials. NYSED remains committed to improving the quality of the State's assessments and the experiences that students have taking these tests. For more information on opportunities to participate in the test development process, please visit the Test Development Participation website (http://www.nysed.gov/state-assessment/test-development-participation-opportunities).

Option for Schools to Administer the Tests on Computer

Schools have the option to administer the Grades 3–8 ELA and Mathematics Tests on computer or paper. More information about this option is available at the NYSED computer-based testing (CBT) Support website (http://cbtsupport.nysed.gov/).

The Next Generation Mathematics Learning Standards

The NYS Next Generation Mathematics Learning Standards define the knowledge, skills, and understandings that individuals can and do habitually demonstrate over time when exposed to high-quality instructional environments and learning experiences. The Learning Standards, defined through the integration of the Standards for Mathematical Content and the Standards for Mathematical Practice, collectively, are focused and cohesive—designed to support student access to the knowledge and understanding of the mathematical concepts that are necessary to function in a world very dependent upon the application of mathematics. Students are expected to understand math conceptually, use procedural skills, and solve math problems rooted in the real world, deciding for themselves which strategies, formulas, and grade-appropriate tools (e.g., calculator, straightedge, or protractor) to use.

Standards for Mathematical Practice

The Learning Standards for each grade level (and high school course) begin with the eight Standards for Mathematical Practice. The Standards for Mathematical Practice describe the ways in which developing practitioners increasingly should engage with the subject matter as they grow in mathematical maturity and expertise throughout the elementary, middle, and high school years. References to the integration of the Standards for Mathematical Content and the Standards for Mathematical Practice are provided throughout the Next Generation Mathematics Learning Standards Document (http://www.nysed.gov/curriculum-instruction/new-york-state-next-generation-mathematics-learning-standards).

Please note that the following grade-level overviews do not include every standard/topic that should be included in instruction. Further information about the entire scope of the learning expectations for each grade level, as well as additional instructional considerations that include the within-grade connections, grade-level fluencies, and connecting the Standards for Mathematical Practice to Mathematical Content can be found in the Next Generation Mathematics Learning Standards Document and the associated grade-level crosswalks/snapshots located on the NYSED website (http://www.nysed.gov/curriculum-instruction/new-york-state-next-generation-mathematics-learning-standards).

Grade 3

In Grade 3, instructional time focuses on four areas: (1) developing understanding of multiplication and division and strategies for multiplication and division within 100; (2) developing understanding of fractions, especially unit fractions (fractions with numerator 1); (3) developing understanding of the structure of rectangular arrays and of area; and (4) describing and analyzing polygons based on the number of sides and vertices.

Grade 4

In Grade 4, instructional time focuses on three areas: (1) developing understanding and fluency with multi-digit multiplication, and developing understanding of dividing to find quotients involving multi-digit dividends; (2) developing an understanding of fraction equivalence, addition and subtraction of fractions with like denominators, and multiplication of fractions by whole numbers; and (3) understanding that geometric figures can be analyzed and classified based on their properties, such as having parallel sides, perpendicular sides, particular angle measures, and symmetry.

Grade 5

In Grade 5, instructional time focuses on three areas: (1) developing fluency with addition and subtraction of fractions, and developing understanding of multiplication of fractions and of division of fractions in limited cases (unit fractions divided by whole numbers and whole numbers divided by unit fractions); (2) extending division to 2-digit divisors, integrating decimal fractions into the place value system and developing understanding of operations with decimals to hundredths, and developing fluency with whole number and decimal operations; and (3) developing understanding of volume.

Grade 6

In Grade 6, instructional time focuses on five areas: (1) connecting ratio and rate to whole number multiplication and division and using concepts of ratio and rate to solve problems; (2) completing understanding of division of fractions and extending the notion of number to the system of rational numbers, which includes negative numbers; (3) writing, interpreting, and using expressions and equations; (4) deepening understanding of area, surface area, and volume; and (5) developing understanding of simple probabilities and statistical thinking.

Grade 7

In Grade 7, instructional time focuses on three areas: (1) developing understanding of and applying proportional relationships; (2) developing understanding of operations with rational numbers and working with expressions and linear equations; and (3) drawing inferences about populations based on samples.

Grade 8

In Grade 8, instructional time focuses on three areas: (1) formulating and reasoning about expressions and equations, including modeling an association in bivariate data with a linear equation, and solving linear equations and systems of linear equations; (2) grasping the concept of a function and using functions to describe quantitative relationships; and (3) analyzing two- and three-dimensional space and figures using distance, angle, similarity, and congruence, and understanding and applying the Pythagorean Theorem.

For more information about the Next Generation Mathematics Learning Standards, please refer to the NYSED website (http://www.nysed.gov/next-generation-learning-standards).

Performance Level Definitions

For each subject area, students perform along a continuum of the knowledge and skills necessary to meet the demands of the Learning Standards for English Language Arts and Mathematics. New York State assessments are designed to classify student performance into one of four levels based on the knowledge and skills the student has demonstrated. Due to the need to identify student proficiency, the state tests must provide students at each performance level opportunities to demonstrate their knowledge and skills in the Next Generation Learning Standards. For this reason, the Performance Level Descriptions play a central role in the test development process, specifically question writing.

These performance levels are defined as:

NYS Level 4

Students performing at this level **excel** in standards for their grade. They demonstrate knowledge, skills, and practices embodied by the Learning Standards that are considered **more than sufficient** for the expectations at this grade.

NYS Level 3

Students performing at this level are **proficient** in standards for their grade. They demonstrate knowledge, skills, and practices embodied by the Learning Standards that are considered **sufficient** for the expectations at this grade.

NYS Level 2

Students performing at this level are **partially proficient** in standards for their grade. They demonstrate knowledge, skills, and practices embodied by the Learning Standards that are considered partial but insufficient for the expectations at this grade. Students performing at Level 2 are considered on track to meet current New York high school graduation requirements but are **not yet proficient** in Learning Standards at this grade.

NYS Level 1

Students performing at this level are **below proficient** in standards for their grade. They may demonstrate **limited** knowledge, skills, and practices embodied by the Learning Standards that are considered **insufficient** for the expectations at this grade.

Performance Level Descriptions

For information about the Next Generation Mathematics Learning Standards Performance Level Descriptions for grades 3–8, please see the website (http://www.nysed.gov/state-assessment/next-generation-learning-standards-mathematics).

Domains, Clusters, Standards, and Sequencing in Instruction and Assessment

The 2023 Grades 3–8 Mathematics Tests will measure the NYS Next Generation Mathematics Learning Standards. The NYS Next Generation Mathematics Learning Standards are divided into *standards*, *clusters*, and *domains*.

- *Standards* define what students should understand and be able to do. In some cases, *standards* are further articulated into lettered components.
- *Clusters* are groups of related *standards*. Note that *standards* from different *clusters* may sometimes be closely related, because mathematics is a connected subject.
- *Domains* are larger groups of related *clusters* and *standards*. *Standards* from different *domains* may be closely related.

Sequencing in Instruction and Assessment

The New York State Mathematics grades 3–8 tests are administered in April/May. Each question on a New York State Mathematics grades 3–8 grade-level test is aligned only to a Pre-Test standard (September-to-April/May) for the grade level or a Post-Test standard (May-to-June) from the prior grade level. While the pre-post guidance provides a clear designation of when students are assessed for understanding content at the proficiency/mastery level, it is not intended to serve as a directive as to when the content should be introduced or how instruction of content should occur.

The charts that follow on pages 7–12 of this guide illustrate the relationship between the *domains, clusters,* and *standards* that comprise each grade level, as well as show the progression of the domains across grade levels. The charts do not indicate any content emphasis. Standards that have been designated as post-test (May-to-June) for each grade level are also noted on the respective grade level's chart. **Standards that are designated for instruction after the administration of the Grades 3–8 Mathematics Tests will be fundamental in ensuring that students are prepared for the instruction of each subsequent grade and may be tested on the subsequent grade level's test**. For more information about the NYS Next Generation Mathematics Learning Standards Grades 3–8 Post-test Standards Designations, please refer to the website (http://www.nysed.gov/curriculum-instruction/next-generation-mathematics-learning-standards-grades-3-8-post-test-recommendations).

Curriculum and instruction that support the content of the learning standards and the unique learning needs of students are locally determined by each individual district in New York State. Teacher preference and flexibility in planning units of study continue to play vital roles to both meet the needs of the students and align with the expectations of the learning standards. For additional guidance with instructional planning surrounding the Next Generation Mathematics Learning Standards, please see the Next Generation Mathematics Learning Standards website (http://www.nysed.gov/next-generation-learning-standards).

Grade 3

Domain	Cluster	Standard(s)	Post Standard
Operations and Algebraic Thinking	*Represent and solve problems involving multiplication and division.*	NY-3.OA.1	
		NY-3.OA.2	
		NY-3.OA.3	
		NY-3.OA.4	
	Understand properties of multiplication and the relationship between multiplication and division.	NY-3.OA.5	
		NY-3.OA.6	
	Multiply and divide within 100.	NY-3.OA.7a,7b (Fluency)	
	Solve problems involving the four operations, and identify and extend patterns in arithmetic.	NY-3.OA.8a, 8b	
		NY-3.OA.9	
Number and Operations in Base Ten	*Use place value understanding and properties of operations to perform multi-digit arithmetic.*	NY-3.NBT.1	
		NY-3.NBT.2 (Fluency)	
		NY-3.NBT.3	
		NY-3.NBT.4a, 4b	
Number and Operations—Fractions	*Develop understanding of fractions as numbers.*	NY-3.NF.1	
		NY-3.NF.2a, 2b	
		NY-3.NF.3a, 3b, 3c, 3d	
Measurement and Data	*Solve problems involving measurement and estimation of intervals of time, liquid volumes, and masses of objects.*	NY-3.MD.1	
		NY-3.MD.2a, 2b	
	Represent and interpret data.	NY-3.MD.3	X
		NY-3.MD.4	X
	Geometric measurement: understand concepts of area and relate area to multiplication and to addition.	NY-3.MD.5a, 5b	
		NY-3.MD.6	
		NY-3.MD.7a, 7b, 7c, 7d	
	Geometric measurement: recognize perimeter as an attribute of plane figures and distinguish between linear and area measures.	NY-3.MD.8a, 8b	X
Geometry	*Reason with shapes and their attributes.*	NY-3.G.1	X
		NY-3.G.2	

X = Standards designated for instruction in May-to-June

Grade 4

Domain	Cluster	Standard(s)	Post Standard
Operations and Algebraic Thinking	*Use the four operations with whole numbers to solve problems.*	NY-4.OA.1	
		NY-4.OA.2	
		NY-4.OA.3a, 3b	
	Gain familiarity with factors and multiples.	NY-4.OA.4	
	Generate and analyze patterns.	NY-4.OA.5	
Number and Operations in Base Ten	*Generalize place value understanding for multi-digit whole numbers.*	NY-4.NBT.1	
		NY-4.NBT.2a, 2b	
		NY-4.NBT.3	
	Use place value understanding and properties of operations to perform multi-digit arithmetic.	NY-4.NBT.4 (Fluency)	
		NY-4.NBT.5	
		NY-4.NBT.6	
Number and Operations—Fractions	*Extend understanding of fraction equivalence and ordering.*	NY-4.NF.1	
		NY-4.NF.2	
	Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers.	NY-4.NF.3a, 3b, 3c, 3d	
		NY-4.NF.4a, 4b, 4c	
	Understand decimal notation for fractions, and compare decimal fractions.	NY-4.NF.5	X
		NY-4.NF.6	X
		NY-4.NF.7	X
Measurement and Data	*Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.*	NY-4.MD.1	X
		NY-4.MD.2a, 2b	X
		NY-4.MD.3	
	Represent and interpret data.	NY-4.MD.4	
	Geometric measurement: understand concepts of angle and measure angles.	NY-4.MD.5a, 5b	
		NY-4.MD.6	
		NY-4.MD.7	
Geometry	*Draw and identify lines and angles, and classify shapes by properties of their lines and angles.*	NY-4.G.1	
		NY-4.G.2a, 2b, 2c	
		NY-4.G.3	

X = Standards designated for instruction in May-to-June

Grade 5

Domain	Cluster	Standard(s)	Post Standard
Operations and Algebraic Thinking	*Write and interpret numerical expressions.*	NY-5.OA.1	X
		NY-5.OA.2	X
	Analyze patterns and relationships.	NY-5.OA.3	X
Number and Operations in Base Ten	*Understand place value system.*	NY-5.NBT.1	
		NY-5.NBT.2	
		NY-5.NBT.3a, 3b	
		NY-5.NBT.4	
	Perform operations with multi-digit whole numbers and with decimals to hundredths.	NY-5.NBT.5 (Fluency)	
		NY-5.NBT.6	
		NY-5.NBT.7	
Number and Operations—Fractions	*Use equivalent fractions as a strategy to add and subtract fractions.*	NY-5.NF.1	
		NY-5.NF.2	
	Apply and extend previous understandings of multiplication and division to multiply and divide fractions.	NY-5.NF.3	
		NY-5.NF.4a, 4b	
		NY-5.NF.5a, 5b	
		NY-5.NF.6	
		NY-5.NF.7a, 7b, 7c	
Measurement and Data	*Convert like measurement units within a given measurement system.*	NY-5.MD.1	
	Represent and interpret data.	NY-5.MD.2	
	Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition.	NY-5.MD.3a, 3b	
		NY-5.MD.4	
		NY-5.MD.5a, 5b, 5c	
Geometry	*Graph points on the coordinate plane to solve real-world and mathematical problems.*	NY-5.G.1	X
		NY-5.G.2	X
	Classify two-dimensional figures into categories based on their properties.	NY-5.G.3	
		NY-5.G.4	

X = Standards designated for instruction in May-to-June

Grade 6

Domain	Cluster	Standard(s)	Post Standard
Ratios and Proportional Relationships	*Understand ratio concepts and use ratio reasoning to solve problems.*	NY-6.RP.1	
		NY-6.RP.2	
		NY-6.RP.3a, 3b, 3c, 3d	
The Number System	*Apply and extend previous understandings of multiplication and division to divide fractions by fractions.*	NY-6.NS.1	
	Compute fluently with multi-digit numbers and find common factors and multiples.	NY-6.NS.2 (Fluency)	
		NY-6.NS.3 (Fluency)	
		NY-6.NS.4	
	Apply and extend previous understandings of numbers to the system of rational numbers.	NY-6.NS.5	
		NY-6.NS.6a, 6b, 6c	
		NY-6.NS.7a, 7b, 7c, 7d	
		NY-6.NS.8	
Expressions, Equations, and Inequalities	*Apply and extend previous understandings of arithmetic to algebraic expressions.*	NY-6.EE.1	
		NY-6.EE.2a, 2b, 2c	
		NY-6.EE.3	
		NY-6.EE.4	
	Reason about and solve one-variable equations and inequalities.	NY-6.EE.5	
		NY-6.EE.6	
		NY-6.EE.7	
		NY-6.EE.8	
	Represent and analyze quantitative relationships between dependent and independent variables.	NY-6.EE.9	
Geometry	*Solve real-world and mathematical problems involving area, surface area, and volume.*	NY-6.G.1	
		NY-6.G.2	
		NY-6.G.3	
		NY-6.G.4	
		NY-6.G.5	
Statistics and Probability	*Develop understanding of statistical variability.*	NY-6.SP.1a, 1b, 1c	X
		NY-6.SP.2	X
		NY-6.SP.3	X
	Summarize and describe distributions.	NY-6.SP.4	X
		NY-6.SP.5a, 5b, 5c, 5d	X
	Investigate chance processes and develop, use, and evaluate probability models.	NY-6.SP.6	X
		NY-6.SP.7	X
		NY-6.SP.8a, 8b	X

X = Standards designated for instruction in May-to-June

Grade 7

Domain	Cluster	Standard(s)	Post Standard
Ratios and Proportional Relationships	*Analyze proportional relationships and use them to solve real-world and mathematical problems.*	NY-7.RP.1	
		NY-7.RP.2a, 2b, 2c, 2d	
		NY-7.RP.3	
The Number System	*Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers.*	NY-7.NS.1a, 1b, 1c, 1d	
		NY-7.NS.2a, 2b, 2c, 2d	
		NY-7.NS.3	
Expressions, Equations, and Inequalities	*Use properties of operations to generate equivalent expressions.*	NY-7.EE.1	
		NY-7.EE.2	
	Solve real-life and mathematical problems using numerical and algebraic expressions, equations, and inequalities.	NY-7.EE.3	
		NY-7.EE.4a (Fluency), 4b	
Geometry	*Draw, construct, and describe geometrical figures and describe the relationships between them.*	NY-7.G.1	
		NY-7.G.2	X
		NY-7.G.3	X
	Solve real-life and mathematical problems involving angle measure, area, surface area, and volume.	NY-7.G.4	X
		NY-7.G.5	X
		NY-7.G.6	X
Statistics and Probability	*Draw informal comparative inferences about two populations.*	NY-7.SP.1	
		NY-7.SP.3	
		NY-7.SP.4	
	Investigate chance processes and develop, use, and evaluate probability models.	NY-7.SP.8a, 8b, 8c	

X = Standards designated for instruction in May-to-June

Grade 8

Domain	Cluster	Standard(s)	Post Standard
The Number System	*Know that there are numbers that are not rational, and approximate them by rational numbers.*	NY-8.NS.1	
		NY-8.NS.2	
Expressions, Equations, and Inequalities	*Work with radicals and integer exponents.*	NY-8.EE.1	
		NY-8.EE.2	
		NY-8.EE.3	X
		NY-8.EE.4	X
	Understand the connections between proportional relationships, lines, and linear equations.	NY-8.EE.5	
		NY-8.EE.6	
	Analyze and solve linear equations and pairs of simultaneous linear equations.	NY-8.EE.7a, 7b	
		NY-8.EE.8a, 8b (Fluency), 8c	X
Functions	*Define, evaluate, and compare functions.*	NY-8.F.1	
		NY-8.F.2	
		NY-8.F.3	
	Use functions to model relationships between quantities.	NY-8.F.4	
		NY-8.F.5	
Geometry	*Understand congruence and similarity using physical models, transparencies, or geometry software.*	NY-8.G.1a, 1b, 1c	
		NY-8.G.2	
		NY-8.G.3	
		NY-8.G.4	
		NY-8.G.5	
	Understand and apply the Pythagorean Theorem.	NY-8.G.6	
		NY-8.G.7	
		NY-8.G.8	
	Solve real-world and mathematical problems involving volume of cylinders, cones, and spheres.	NY-8.G.9	
Statistics and Probability	*Investigate patterns of association in bivariate data.*	NY-8.SP.1	
		NY-8.SP.2	
		NY-8.SP.3	

X = Standards designated for instruction in May-to-June

Testing Sessions

The 2023 Grades 3–8 Mathematics Tests consist of two sessions that are administered over two days. Students will be provided as much time as necessary within the confines of the regular school day to complete each test session. School personnel should use their best professional judgment and knowledge about individual students to determine how long a student should be engaged in taking a particular assessment and when it is in the student's best interest to end the test session.

Although test duration will vary among students, the table below estimates the average time it will take students to complete each session of the exam and is intended for test preparation and planning. It is strongly encouraged for educators to share the information with students and parents prior to the test administration.

	Average Time to Complete Session 1	Average Time to Complete Session 2
Grade 3	55–65 Minutes	60–70 Minutes
Grade 4	65–75 Minutes	65–75 Minutes
Grade 5	80–90 Minutes	70–80 Minutes
Grade 6	80–90 Minutes	75–85 Minutes
Grade 7	80–90 Minutes	75–85 Minutes
Grade 8	80–90 Minutes	75–85 Minutes

The tests must be administered under standard conditions and the directions must be followed carefully. The same test administration procedures must be used with all students so that valid inferences can be drawn from the test results.

NYSED devotes great attention to the security and integrity of the New York State Testing Program. School administrators and teachers involved in the administration of State assessments are responsible for understanding and adhering to the instructions set forth in the *School Administrator's Manual* (http://www.nysed.gov/common/nysed/files/programs/state-assessment/38-sam-2022.pdf) and the *Teacher's Directions* (http://www.nysed.gov/state-assessment/grades-3-8-ela-and-math-test-manuals).

When Students Have Completed Their Tests

Students who finish their assessment should be encouraged to go back and check their work. Once the student has completed their test, examination materials should be collected by the proctor. After a student's assessment materials are collected, or the student has submitted the test if testing on computer, that student may be permitted to read silently. This privilege is granted at the discretion of each school. No talking and no other schoolwork is permitted.[1]

Given that the Spring 2023 tests have no time limits, schools and districts have the discretion to create their own approach to ensure that all students who are productively working are given the time they need **within the confines of the regular school day** to continue to take the tests. If the test is administered in a large-group setting, school administrators may prefer to allow students to hand in their test materials, or submit the test if testing on computer, as they finish and then leave the room. If so, take care that students leave the room as quietly as possible so as not to disturb the students who are still working on the test.

[1] For more detailed information about test administration, including proper procedures for proctoring, please refer to the *School Administrator's Manual* and the *Teacher's Directions.*

Test Design

In Grades 3–8, students are required to apply mathematical understandings and mathematical practices gained in the classroom in order to answer four types of questions: 1-credit multiple-choice questions, 1-credit constructed-response questions, 2-credit constructed-response questions, and 3-credit constructed-response questions. Session 1 consists of multiple-choice questions. Session 2 consists of multiple-choice and constructed-response questions. **Students will NOT be permitted to use calculators in Grades 3–5. In Session 2 of Grade 6, students must have the exclusive use of a four-function calculator with a square root key or a scientific calculator. In Grades 7–8, students must have the exclusive use of a scientific calculator for both Session 1 and Session 2**. For more information about calculator use, please refer to page 23.

The charts below illustrate the test designs for the 2023 Grades 3–8 Mathematics Tests. Embedded field test questions are included in the number of multiple-choice questions in Session 1 listed below. It will not be apparent to students whether a question is an embedded field test question that does not count toward their score or an operational test question that does count toward their score.

2023 Grade 3 Test Design

Session	Number of Multiple-Choice Questions	Number of Constructed-Response Questions 1-Credit	Number of Constructed-Response Questions 2-Credit	Number of Constructed-Response Questions 3-Credit	Total Number of Questions
1	25	0	0	0	25
2	5	3	4	1	13
Total	30	3	4	1	38

2023 Grade 4–5 Test Design

Session	Number of Multiple-Choice Questions	Number of Constructed-Response Questions 1-Credit	Number of Constructed-Response Questions 2-Credit	Number of Constructed-Response Questions 3-Credit	Total Number of Questions
1	30	0	0	0	30
2	5	3	5	1	14
Total	35	3	5	1	44

2023 Grade 6 Test Design

Session	Number of Multiple-Choice Questions	Number of Constructed-Response Questions 1-Credit	Number of Constructed-Response Questions 2-Credit	Number of Constructed-Response Questions 3-Credit	Total Number of Questions
1	30	0	0	0	30
2	6	3	6	1	16
Total	36	3	6	1	46

2023 Grade 7–8 Test Design

Session	Number of Multiple-Choice Questions	Number of Constructed-Response Questions 1-Credit	Number of Constructed-Response Questions 2-Credit	Number of Constructed-Response Questions 3-Credit	Total Number of Questions
1	32	0	0	0	32
2	6	3	6	1	16
Total	38	3	6	1	48

Test Blueprint

All questions on the 2023 Grades 3–8 Mathematics Tests measure the Next Generation Mathematics Learning Standards. All the content at each grade level is connected to the Standards for Mathematical Practice; therefore, the 2023 Grades 3–8 Mathematics Tests will include questions that require students to connect mathematical content and mathematical practice.

While all questions are linked to a primary standard, some questions measure more than one standard and one or more of the Standards for Mathematical Practice. Similarly, some questions measure cluster-level understandings. As a result of the alignment to standards, clusters, and Standards for Mathematical Practice, the tests assess students' conceptual understanding, procedural fluency, and problem-solving abilities, rather than assessing their knowledge of isolated skills and facts.

The tables below illustrate the domain-level test blueprint percent ranges for each grade. For further detail of the scope of grade-level content, please see the grade-level standards charts on pages 7–12 of this guide.

Domain-Level Test Blueprint—Percent Ranges for Grade 3 Test				
Operations and Algebraic Thinking	**Number and Operations in Base Ten**	**Number and Operations—Fractions**	**Measurement and Data**	**Geometry**
31–43%	**7–14%**	**18–29%**	**21–32%**	**2–8%**

Domain-Level Test Blueprint—Percent Ranges for Grade 4 Test				
Operations and Algebraic Thinking	**Number and Operations in Base Ten**	**Number and Operations—Fractions**	**Measurement and Data**	**Geometry**
15–25%	**20–30%**	**20–30%**	**9–14%**	**13–23%**

Domain-Level Test Blueprint—Percent Ranges for Grade 5 Test				
Operations and Algebraic Thinking	**Number and Operations in Base Ten**	**Number and Operations—Fractions**	**Measurement and Data**	**Geometry**
Post[2]	**25–35%**	**34–44%**	**22–32%**	**2–7%**

Domain-Level Test Blueprint—Percent Ranges for Grade 6 Test				
Ratios and Proportional Relationships	**The Number System**	**Expressions, Equations, and Inequalities**	**Geometry**	**Statistics and Probability**
21–30%	**17–26%**	**25–43%**	**14–24%**	**Post[2]**

[2] All standards in the domain are post-test standards and are not assessed in the current grade level State Assessment. See page 6, Sequencing in Instruction and Assessment, for additional information.

Domain-Level Test Blueprint—Percent Ranges for Grade 7 Test				
Ratios and Proportional Relationships	**The Number System**	**Expressions, Equations, and Inequalities**	**Geometry**	**Statistics and Probability**
24–33%	**16–25%**	**26–39%**	**2–7%**	**12–21%**

Domain-Level Test Blueprint—Percent Ranges for Grade 8 Test				
The Number System	**Expressions, Equations, and Inequalities**	**Functions**	**Geometry**	**Statistics and Probability**
2–9%	**28–41%**	**16–25%**	**28–41%**	**4–11%**

Question Formats

The 2023 Grades 3–8 Mathematics Tests contain 1-credit multiple-choice questions, 1-credit constructed-response questions, 2-credit constructed-response questions, and 3-credit constructed-response questions. For multiple-choice questions, students select the correct response from four answer choices. For the constructed-response questions, students write an answer to an open-ended question and may be required to show their work. In some cases, they may be required to provide a written explanation for how they arrived at their answers. Some test questions target more than one standard or assess an entire cluster. As such, many individual test questions assess September-to-April/May standards in conjunction with May-to-June standards from past grades (i.e., post-test standards).

Multiple-Choice 1-credit Questions

Multiple-choice questions will mainly be used to assess procedural skills and conceptual understanding. Many multiple-choice questions require students to complete multiple steps. Likewise, some of these questions are linked to more than one standard, drawing on the simultaneous application of multiple skills and concepts. Within answer choices, distractors[3] will all be based on plausible missteps.

Constructed-Response 1-credit Questions

Constructed-response 1-credit questions require students to complete a task and provide only their final answer. The constructed-response 1-credit questions will often require multiple steps, assessing procedural skills, as well as conceptual understanding and application. While students may show how they arrived to their final answer, only the final answer will be scored.

Constructed-Response 2-credit Questions

Constructed-response 2-credit questions require students to complete a task and show their work. Constructed-response 2-credit questions will often require multiple steps, the application of multiple mathematics skills, and real-world applications. Many of the constructed-response 2-credit questions will assess conceptual application and understanding.

Constructed-Response 3-credit Questions

Constructed-response 3-credit questions ask students to show their work in completing two or more tasks or a more extensive problem. Constructed-response 3-credit questions allow students to show their understanding of mathematical procedures, conceptual understanding, and application. Constructed-response 3-credit questions may also assess student reasoning and the ability to critique the arguments of others.

Additional Assessment Resources

The New York State Question Sampler (http://www.nysed.gov/state-assessment/question-sampler) provides a preview of the question types in the computer-based testing platform designed to help students prepare for testing day using the online testing tools.

[3] A distractor is an incorrect response that may appear to be a plausible correct response to a student who has not mastered the skill or concept being assessed.

Mathematics Rubrics and Scoring Policies

The 2023 Grades 3–8 Mathematics Tests will use the rubrics and scoring policies as shown in this guide.

1-Credit Constructed-Response Rubric

1 Credit	A 1-credit response is a **correct answer** to the question which indicates a thorough understanding of mathematical concepts and/or procedures.
0 Credits*	A 0-credit response is incorrect, irrelevant, or incoherent.

* Condition Code A is applied whenever a student who is present for a test session leaves an entire constructed-response question in that session completely blank (no response attempted).

2-Credit Constructed-Response Holistic Rubric

2 Credits	A 2-credit response includes the correct solution to the question and demonstrates a thorough understanding of the mathematical concepts and/or procedures in the task. This response • indicates that the student has completed the task correctly, using mathematically sound procedures • contains sufficient work to demonstrate a thorough understanding of the mathematical concepts and/or procedures • may contain inconsequential errors that do not detract from the correct solution and the demonstration of a thorough understanding
1 Credit	A 1-credit response demonstrates only a partial understanding of the mathematical concepts and/or procedures in the task. This response • correctly addresses only some elements of the task • may contain an incorrect solution but applies a mathematically appropriate process • may contain the correct solution but required work is incomplete
0 Credits*	A 0-credit response is incorrect, irrelevant, incoherent, or contains a correct solution obtained using an obviously incorrect procedure. Although some elements may contain correct mathematical procedures, holistically they are not sufficient to demonstrate even a limited understanding of the mathematical concepts embodied in the task.

* Condition Code A is applied whenever a student who is present for a test session leaves an entire constructed-response question in that session completely blank (no response attempted).

3-Credit Constructed-Response Holistic Rubric

3 Credits	A 3-credit response includes the correct solution(s) to the question and demonstrates a thorough understanding of the mathematical concepts and/or procedures in the task. This response • indicates that the student has completed the task correctly, using mathematically sound procedures • contains sufficient work to demonstrate a thorough understanding of the mathematical concepts and/or procedures • may contain inconsequential errors that do not detract from the correct solution(s) and the demonstration of a thorough understanding
2 Credits	A 2-credit response demonstrates a partial understanding of the mathematical concepts and/or procedures in the task. This response • appropriately addresses most but not all aspects of the task using mathematically sound procedures • may contain an incorrect solution but provides sound procedures, reasoning, and/or explanations • may reflect some minor misunderstanding of the underlying mathematical concepts and/or procedures
1 Credit	A 1-credit response demonstrates only a limited understanding of the mathematical concepts and/or procedures in the task. This response • may address some elements of the task correctly but reaches an inadequate solution and/or provides reasoning that is faulty or incomplete • exhibits multiple flaws related to misunderstanding of important aspects of the task, misuse of mathematical procedures, or faulty mathematical reasoning • reflects a lack of essential understanding of the underlying mathematical concepts • may contain the correct solution(s) but required work is limited
0 Credits*	A 0-credit response is incorrect, irrelevant, incoherent, or contains a correct solution obtained using an obviously incorrect procedure. Although some elements may contain correct mathematical procedures, holistically they are not sufficient to demonstrate even a limited understanding of the mathematical concepts embodied in the task.

* Condition Code A is applied whenever a student who is present for a test session leaves an entire constructed-response question in that session completely blank (no response attempted).

The following scoring policies must be applied while scoring the mathematics tests for all grades 3–8. The rubrics for the constructed-response questions are designed to provide a systematic, consistent method for awarding credit. Each response must be rated carefully using the teacher's professional judgment and knowledge of mathematics. Any directions about acceptable formats of answers must be followed (e.g., decimal number, rounding, simplest form, in terms of π). If the answer format for a question is not specified, mathematically equivalent solutions should be awarded credit. Please see the scoring materials for further details on acceptable answer formats specific to individual questions.

2023 1-Credit Constructed-Response Mathematics Scoring Policies

1. The student is **not** required to show work for a 1-credit constructed-response question, therefore, any work shown will **not** be scored. A clearly identified correct response should still receive full credit.
2. If the student clearly identifies a correct answer but fails to write that answer in the answer space, the student should still receive full credit.
3. If the student provides one legible response (and one response only), the rater should score the response, even if it has been crossed out.
4. If the student has written more than one response but has crossed some out, the rater should score only the response that has **not** been crossed out.
5. If the student provides more than one response but does not indicate which response is to be considered the correct response and none have been crossed out, the student shall not receive credit.
6. If the student does not provide the answer in the form as directed in the question, the student will not receive credit.
7. In questions requiring number sentences, the number sentences must be written horizontally.
8. When measuring angles with a protractor, there is a +/- 5 degrees deviation allowed of the true measure.
9. Condition Code A is applied whenever a student who is present for a test session leaves an entire constructed-response question in that session completely blank (no response attempted). This is not to be confused with a score of zero wherein the student does respond to part or all of the question, but that work results in a score of zero.

2023 2- and 3-Credit Constructed-Response Mathematics Scoring Policies

1. If a student shows the work in other than a designated "Show your work" or "Explain" area, that work should still be scored.
2. If the question requires students to show their work, and the student shows appropriate work and clearly identifies a correct answer but fails to write that answer in the answer space, the student should still receive full credit.
3. If students are directed to show work or provide an explanation, a correct answer with **no** work shown or **no** explanation provided, receives **no** credit.
4. If students are **not** directed to show work, any work shown will **not** be scored. This applies to questions that do **not** ask for any work and questions that ask for work for one part and do **not** ask for work in another part.
5. If the student provides one legible response (and one response only), the rater should score the response, even if it has been crossed out.
6. If the student has written more than one response but has crossed some out, the rater should score only the response that has **not** been crossed out.
7. If the student provides more than one response, but does not indicate which response is to be considered the correct response and none have been crossed out, the student shall not receive full credit.
8. Trial-and-error responses are **not** subject to Scoring Policy #6 above, since crossing out is part of the trial-and-error process.
9. If a response shows repeated occurrences of the same conceptual error within a question, the conceptual error should **not** be considered more than once in gauging the demonstrated level of understanding.
10. In questions requiring number sentences, the number sentences must be written horizontally.
11. When measuring angles with a protractor, there is a +/- 5 degrees deviation allowed of the true measure.
12. Condition Code A is applied whenever a student who is present for a test session leaves an entire constructed-response question in that session completely blank (no response attempted). This is not to be confused with a score of zero wherein the student does respond to part or all of the question but that work results in a score of zero.

Mathematics Tools

Why Mathematics Tools?

These provisions are necessary for students to meet Standard for Mathematical Practice Five found throughout the New York State Next Generation Mathematics Learning Standards:

> **Use appropriate tools strategically**
>
> *Mathematically proficient students consider the available tools when solving a mathematical problem. Proficient students are sufficiently familiar with tools appropriate for their grade or course to make sound decisions about when each of these tools might be helpful, recognizing both the insight to be gained and their limitations. Mathematically proficient students at various grade levels are able to identify relevant external mathematical resources, such as digital content located on a website, and use them to pose or solve problems. They are able to use technological tools to explore and deepen their understanding of concepts.*

It is up to the student to decide when it will be helpful to use the mathematics tools to answer a question.

Rulers and Protractors

Students in Grade 3 must have a ruler for their exclusive use for both sessions of the test. Students in Grades 4–8 must have a ruler and a protractor for their exclusive use for all sessions of the test. Students with disabilities may use adapted rulers and protractors if this is indicated as a testing accommodation on the student's Individualized Education Program or Section 504 Accommodation Plan.

Note: Schools are responsible for supplying the appropriate tools for use with the Grades 3–8 Mathematics Tests when testing with printed test booklets. A ruler tool and a protractor tool are provided to the student as part of the computer testing delivery system, Nextera.

Calculators

Students in Grades 3–5 are **NOT** permitted to use a calculator on the 2023 Mathematics Tests.

Students in Grade 6 are **NOT** permitted to use a calculator with Session 1. For Session 2, students should have exclusive **use of a four-function calculator with a square root key or a scientific calculator**. Graphing calculators are **NOT** permitted.

Students in Grades 7–8 should have exclusive **use of a scientific calculator** for both Session 1 and Session 2. Graphing calculators are **NOT** permitted.

For students testing on computers in Grades 6–8, a calculator is provided as part of the computer testing delivery system, but schools should continue to supply students with exclusive use of the type of hand-held calculator the students use for everyday mathematics instruction.

Value of Pi

Students should learn that π is an irrational number. For the constructed-response questions in Grades 7–8 (Session 2), the π key and the full display of the calculator should be used in computations. The approximate values of π, such as 3.1416, 3.14, or $\frac{22}{7}$, are unacceptable.

More information on mathematics tool specifications can be found in the School Administrator's Manual, Appendix E, located on the OSA website (http://www.nysed.gov/state-assessment/grades-3-8-ela-and-math-test-manuals).

Reference Sheets

Each student testing in Grades 5–8 will be provided with a mathematics reference sheet for their exclusive use during both Session 1 and Session 2. It is recommended that throughout the year, teachers provide students opportunities during classroom instruction to gain familiarity with the grade-level reference sheet. **Note:** Due to certain standards' expectations for grades 7–8, conversion factors that go across measurement systems are also provided. Students should utilize these conversion factors provided on the reference sheet even though some of the conversion factors shown may not be exact.

Grade 5 Mathematics Reference Sheet

CONVERSIONS

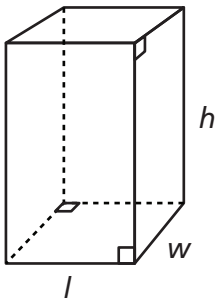
1 yard = 3 feet
1 mile = 5,280 feet
1 mile = 1,760 yards

1 cup = 8 fluid ounces
1 pint = 2 cups
1 quart = 2 pints
1 gallon = 4 quarts
1 liter = 1,000 milliliters

1 pound = 16 ounces
1 ton = 2,000 pounds
1 kilogram = 1,000 grams

FORMULAS AND FIGURES

Right Rectangular Prism



$V = l \times w \times h$
$V = B \times h$

Grade 6 Mathematics Reference Sheet

CONVERSIONS

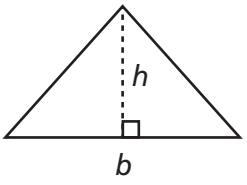
1 yard = 3 feet
1 mile = 5,280 feet

1 cup = 8 fluid ounces
1 pint = 2 cups
1 quart = 2 pints
1 gallon = 4 quarts
1 liter = 1,000 milliliters

1 pound = 16 ounces
1 ton = 2,000 pounds
1 kilogram = 1,000 grams

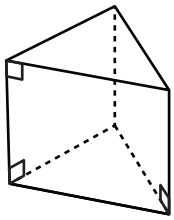
FORMULAS AND FIGURES

Triangle

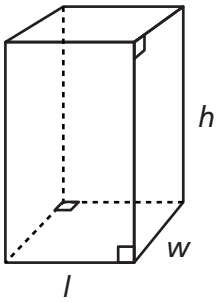


$A = \frac{1}{2}bh$

Right Triangular Prism

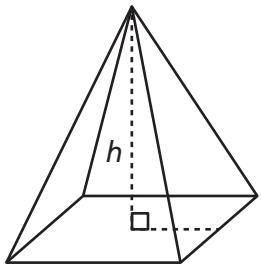


Right Rectangular Prism



$V = lwh$
$V = Bh$

Right Rectangular Pyramid



Grade 7 Mathematics Reference Sheet

CONVERSIONS

1 yard = 3 feet
1 mile = 5,280 feet

1 cup = 8 fluid ounces
1 pint = 2 cups
1 quart = 2 pints
1 gallon = 4 quarts

1 pound = 16 ounces
1 ton = 2,000 pounds

CONVERSIONS ACROSS MEASUREMENT SYSTEMS

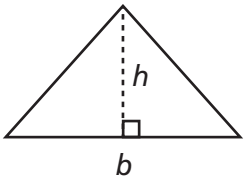
1 inch = 2.54 centimeters
1 meter = 39.37 inches
1 mile = 1.609 kilometers
1 kilometer = 0.6214 mile

1 gallon = 3.785 liters
1 liter = 0.2642 gallon

1 pound = 0.454 kilogram
1 kilogram = 2.2 pounds

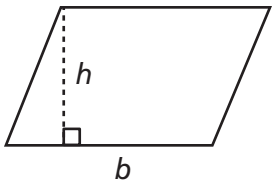
FORMULAS AND FIGURES

Triangle



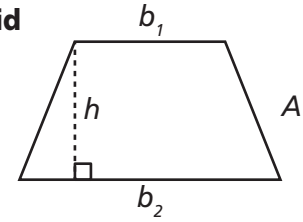
$A = \frac{1}{2}bh$

Parallelogram



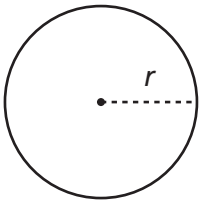
$A = bh$

Trapezoid



$A = \frac{1}{2}h(b_1 + b_2)$

Circle



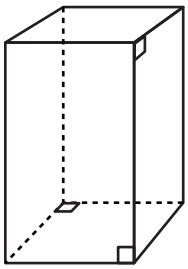
$C = 2\pi r$
$C = \pi d$
$A = \pi r^2$

Simple Interest

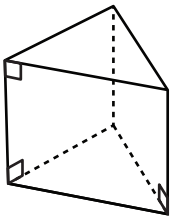
$I = prt$ where I is interest, p is principal, r is rate, and t is time

General Prism $V = Bh$

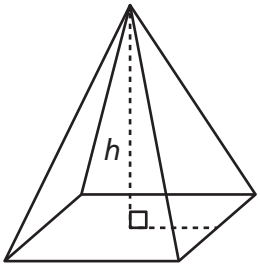
Right Rectangular Prism



Right Triangular Prism



Right Rectangular Pyramid



Grade 8 Mathematics Reference Sheet

CONVERSIONS

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1 gallon = 4 quarts

1 pound = 16 ounces
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CONVERSIONS ACROSS MEASUREMENT SYSTEMS

1 inch = 2.54 centimeters
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1 mile = 1.609 kilometers
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1 gallon = 3.785 liters
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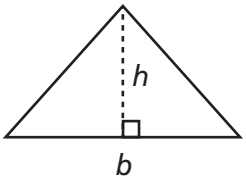
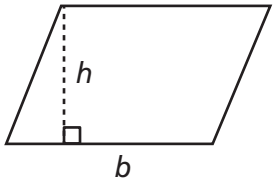
FORMULAS AND FIGURES

Triangle



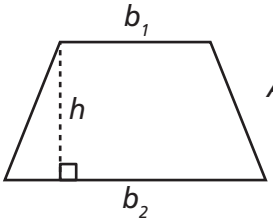
$A = \frac{1}{2}bh$

Parallelogram



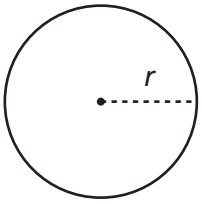
$A = bh$

Trapezoid



$A = \frac{1}{2}h(b_1 + b_2)$

Circle

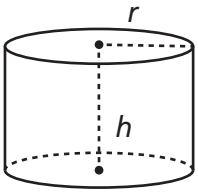


$C = 2\pi r$
$C = \pi d$
$A = \pi r^2$

General Prism

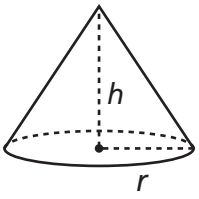
$V = Bh$

Right Cylinder



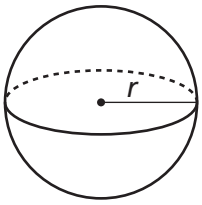
$V = \pi r^2 h$

Right Cone



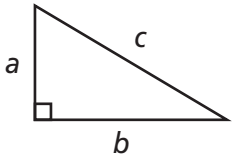
$V = \frac{1}{3}\pi r^2 h$

Sphere



$V = \frac{4}{3}\pi r^3$

Pythagorean Theorem



$c^2 = a^2 + b^2$