Introduction

The Math Test Specifications provide an overview of the structure and content of Ohio's State Test. This overview includes a description of the test design as well as information on the types of items that will appear on the test. Also included is a test blueprint, a document that identifies the range and distribution of points grouped into various reporting categories (e.g., Fractions, Ratios and Proportions, Functions, Probability). The specifications also provide specific guidelines for the development of all items used for Ohio's math tests.
This document is a resource not only for item writers and test designers, but also for Ohio educators and other stakeholders who are interested in a deeper understanding of the test.

Overview of Structure and Content

Ohio's Learning Standards

In 2017, Ohio adopted revisions to Ohio's Learning Standards for Mathematics which include standards for mathematical content and mathematical practice. Then, based on the 2017 Standards, Ohio adopted revisions to the Model Curriculum, a document that connects standards to instruction. The mathematics assessment items (test questions) align to the 2017 Standards.

Standards for Mathematical Practice

The Standards for Mathematical Practice (SMP) describe skills that mathematics educators at all levels should seek to develop in their students. These practices rest on important "processes and proficiencies" with longstanding importance in mathematics education. The design of each item on Ohio's state tests encourages students to use one or more Standards for Mathematical Practice. Below is a list of the mathematical practices.

Grade 6 Standards for Mathematical Practice
1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

Blueprint

Test blueprints serve as a guide for test construction and provide an outline of the content and skills to be measured on the test. They contain information about the number of points of opportunity students will encounter in each reporting category on the math test. The following test blueprint displays the distribution of the content standards and depth of knowledge across the entire test and categories for reporting test results for Grade 6.

Reporting Category	Standards				Approximate Portion of Test
Ratios and Proportions	6.RP.1				24% – 33% 13 – 17 points
	6.RP.2				
	6.RP.3				
Expressions and Equations	6.EE.1	6.EE.4	6.EE.7		31% – 44% 17 – 23 points
	6.EE.2	6.EE.5	6.EE.8		
	6.EE.3	6.EE.6	6.EE.9		
Geometry and Statistics	6.NS.8	6.G.3	6.SP.1	6.SP.4	20% – 25% 11 – 13 points
	6.G.1	6.G.4	6.SP.2	6.SP.5	
	6.G.2		6.SP.3		
The Number System	6.NS.1	6.NS.3	6.NS.5	6.NS.7	20% – 25% 11 – 13 points
	6.NS.2	6.NS.4	6.NS.6		
				Total Test	52 – 54 points

Modeling and Reasoning*

(minimum 20%)

Depth of Knowledge (DOK) Level	Approximate Portion of Test
1	8 – 16 points
2	25 – 34 points
3	8 – 16 points

Modeling and Reasoning

Modeling and Reasoning are included in the eight Standards for Mathematical Practice within Ohio's Learning Standards. Each grade's blueprint identifies modeling and reasoning as an independent reporting category that will account for a minimum of 20 percent of the overall points on that grade's test.

Depth of Knowledge (DOK)

DOK refers to the complexity of thinking required to complete a task in a given item. Items with a DOK 1 designation focus on the recall of information, such as definitions and terms, and simple procedures. Items with a DOK 2 designation require students to make decisions, solve routine problems, perform calculations, or recognize patterns. Items with a DOK 3 designation feature higher-order cognitive tasks. These DOK 3 tasks include but are not limited to: critiquing a statement and forming a conclusion; explaining, justifying, or proving a statement; or approaching abstract, complex, open-ended, and non-routine problems. Each grade's blueprint contains information about the number of points of opportunity students will encounter at each DOK level.

Test Design

The assessment is a two-part test, developed in a computer-based format and a paper-based format. Its purpose is to measure student progress and provide information to parents, teachers, and building, district and state administrators. The test will contain technology-enhanced items that require the student to enter a response into the computer interface. The test will be administered near the end of the academic school year or the end of a semester (for high school). The test can be administered in one or two sessions. After the student has completed both parts of the test, his or her scores will be combined to yield a comprehensive test score. Test results are reported back to schools by June 30th.

Performance Level Descriptors (PLDs)

At each grade level/course, PLDs are general statements describing what students should know or be able to do at each performance level.

After the Ohio State Mathematics test is scored, each student's performance level is identified based on the combined scores (Part 1 and Part 2). Districts and schools are sent item level reports and the performance level for each student along with the performance level descriptors. Teachers and math coaches can use this information for their instructional design.

Calculator

Calculators are **not** permitted for use on either the paper-based or computer-based mathematics test for grades 3-5. Grades 6 and 7 have a non-calculator part and a calculator part for both the paper-based and the computer-based mathematics test. The calculator designation for items in grades 6 and 7 is decided during development on an item-by-item basis. A calculator may be used on the entire grade 8 and high school End of Course (EOC) paper-based or computer-based mathematics tests. Note that calculator usage may differ for those students with an Individualized Education Plan (IEP) or 504 plan that specifies a calculator accommodation.

- Guidance on Desmos Calculator for Grades 3-8
- Grades 3-8 Handheld Calculator Guidance

- Guidance on Desmos Calculator for High School
- High School Handheld Calculator Guidance

Reference Sheets

A reference sheet may be used on the Ohio State Mathematics Tests by all students in grades four and above. For paper-based testers, the math reference sheets will be included within the student test booklet. For online testers, the math reference sheet is embedded within the testing platform.

Interaction Types

Ohio's State Tests are composed of several interaction types. Currently, there are ten interaction types that may appear on a math computer-based assessment:

- Equation Item (EQ)
- Gap Match Item (GM)
- Grid Item (GI)
- Hot Text Item (HT)
- Inline Choice Item (IC)
- Matching Item (MI)
- Multiple Choice Item (MC)
- Multi Select Item (MS)
- Simulation Item (Sim)
- Table Item (TI)

For paper-based assessments (including those for students with an IEP or 504 plan that specifies a paper-based accommodation), the items may be modified so that they can be scanned and scored electronically or hand-scored.

Interaction Type	Description
Equation Item (EQ)	The student is presented with a keypad that includes a variety of mathematical symbols that can be used to create a response. Responses may be in the form of a number, variable, expression, or equation, as appropriate to the test item. The student enters their response in the response box which may be on a line by itself, or embedded in a sentence or phrase. For paper-based assessments, this interaction type may be replaced with a modified version of the item that can be scanned and scored electronically or the student may be given an answer box to write their answer.

Interaction Type	Description
Gap Match Item (GM)	Given a set of options (e.g., numbers, words, phrases, or sentences) the student hovers over the options which then highlight, indicating that the option is selectable. The student can then click on the object, hold down the mouse button, and drag it to an answer area, indicated by a dotted box, in a graphic, table, or paragraph. For paper-based assessments, the options are associated with a letter, and students write a letter for their response in each response area.
Grid Item (GI)	The student may select numbers, words, phrases, or images to display their response. The student may also use the drag-and-drop feature to place objects into a response area. This interaction type may also require the student to use the point, line, or arrow tools to create a response on a graph or gridded area. For paper-based assessments, the student may be given the response space to draw their answer, or this interaction type may be replaced with another interaction type that assesses the same standard at the same level of difficulty and can be scanned and scored electronically.
Hot Text Item (HT)	**Selectable Hot Text -** Given a set of options (e.g., phrases, sentences, or numbers) the student hovers over the options which then highlight, indicating that the text is selectable ("hot"). The student can then click on an option to select it as their response. For paper-based assessments, a "selectable" hot text item is modified so that it can be scanned and scored electronically. The student fills in a circle to indicate the correct response.
	Drag-and-Drop Hot Text - Given a set of options (e.g., numbers, words, phrases, or sentences) the student hovers over the options which then highlight, indicating that the option is selectable ("hot"). The student can then click on the object, hold down the mouse button, and drag it to a graphic, table, or paragraph. For paper-based assessments, the options are associated with a letter, and students write a letter for their response in each response area.
Inline Choice Item (IC)	Given a sentence, paragraph, or table, the student clicks a blank box embedded within a sentence or table which reveals a drop-down menu containing options for completing a sentence or table. The student then selects an option from the drop-down menu to respond. For paper-based assessments, the interaction is modified so that it can be scanned and scored electronically. The student fills in a circle to indicate the correct response.
Matching Item (MI)	Given column and row headers in a table format, the student checks a box to indicate if information from a column header matches information from a row header. For paper-based assessments, the interaction is modified so that it can be scanned and scored electronically. The student fills in a circle to indicate the correct response.

Interaction Type	Description
Multiple Choice Item (MC)	The student selects one correct answer from four options. For paper-based assessments, the student fills in a circle to indicate the correct response.
Multi Select Item (MS)	The student is directed to either select an indicated number of correct answers or to select all of the correct answers. Students in grades 3-5 always select an indicated number of correct answers; students in grades 6-8 select an indicated number of correct answers on 50% of the items and select all on 50% of the items; and students taking high school end-of-course tests are always directed to select all correct answers. These items are different from multiple choice items, and require the student to select 2 or more correct answers. For paper-based assessments, the student fills in circles to indicate the correct responses.
Simulation Item (Sim)	Given a set of instructions, the student may interact with any of the following controls to generate data: radio buttons, drop-down menus, slide bars, or selecting a number by clicking arrows. Once the student has set the parameters, they click the start button to begin the simulation and generate a data set. Once the student has enough data, they may answer questions about the data using a different interaction type. For paper-based assessments, this interaction will be replaced with another interaction type that assesses the same standard at the same level of difficulty and can be scanned and scored electronically.
Table Item (TI)	The student types numeric values into a given table. The student may complete the entire table or portions of the table depending on what is being asked. For paper-based assessments, the student writes their responses in the blank boxes of the table.

Specific Guidelines for Item Development

Standards are presented according to reporting categories as shown on grade level or course blueprints.

Reporting Category	**RATIOS AND PROPORTIONS**
Content Standard	***6.RP RATIOS AND PROPORTIONAL RELATIONSHIPS*** **Understand ratio concepts and use ratio reasoning to solve problems.** ***6.RP.1*** Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities. *For example, "The ratio of wings to beaks in the bird house at the zoo was 2:1, because for every 2 wings there was 1 beak." "For every vote candidate A received, candidate C received nearly three votes."*
Content Limits	• Numbers in a ratio will be expressed as whole numbers or decimals. • Ratios can be expressed as a fraction (1/5), with a colon (1:5), or with words, e.g., *per, to, each, for each*, *for every*.
DOK	1, 2, and/or 3 are eligible. DOK levels are designated on an item-by-item basis.
Context	Context Required

Reporting Category	**RATIOS AND PROPORTIONS**
Content Standard	***6.RP RATIOS AND PROPORTIONAL RELATIONSHIPS*** **Understand ratio concepts and use ratio reasoning to solve problems.** ***6.RP.2*** Understand the concept of a unit rate a/b associated with a ratio $a:b$ with $b \neq 0$, and use rate language in the context of a ratio relationship. *For example, "This recipe has a ratio of 3 cups of flour to 4 cups of sugar, so there is $3/4$ cup of flour for each cup of sugar." "We paid $75 for 15 hamburgers, which is a rate of $5 per hamburger."*
Content Limits	• Numbers in a rate will be expressed as whole numbers or decimals. • Ratios can be expressed as a fraction (1/5), with a colon (1:5), or with words, e.g., *per, to, each, for each*, *for every*.
DOK	1, 2, and/or 3 are eligible. DOK levels are designated on an item-by-item basis.
Context	Context Required

Reporting Category	**RATIOS AND PROPORTIONS**
Content Standard	***6.RP RATIOS AND PROPORTIONAL RELATIONSHIPS*** **Understand ratio concepts and use ratio reasoning to solve problems.** ***6.RP.3*** Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations. ***6.RP.3a*** Make tables of equivalent ratios relating quantities with whole-number measurements; find missing values in the tables; and plot the pairs of values on the coordinate plane. Use tables to compare ratios. ***6.RP.3b*** Solve unit rate problems including those involving unit pricing and constant speed. *For example, if it took 7 hours to mow 4 lawns, then at that rate, how many lawns could be mowed in 35 hours? At what rate were lawns being mowed?* ***6.RP.3c*** Find a percent of a quantity as a rate per 100, e.g., 30% of a quantity means $^{30}/_{100}$ times the quantity; solve problems involving finding the whole, given a part and the percent. ***6.RP.3d*** Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities.
Content Limits	• Numbers will be expressed as whole numbers or decimals. • Ratios and rates can be expressed as a fraction (1/5), with a colon (1:5), or with words, e.g., *per, to, each, for each*, *for every*. • For 3c, benchmark percents (1%, 5%, 10%, 20%, 25%, 50%, and 100%) will be used. • For 3c, items may require students to find the part, the whole, and/or the percent in a real-world or mathematical problem.
DOK	1, 2, and/or 3 are eligible. DOK levels are designated on an item-by-item basis.
Context	Context Optional

Reporting Category	**EXPRESSIONS AND EQUATIONS**
Content Standard	***6.EE EXPRESSIONS AND EQUATIONS*** **Apply and extend previous understandings of arithmetic to algebraic expressions.** ***6.EE.1*** Write and evaluate numerical expressions involving whole-number exponents.
Content Limits	• Positive rational number bases will be used. • Only whole number exponents will be used. • Expressions must contain at least one exponent. • Items will not require the student to calculate unknown bases of exponents. • Items may require the use of the order of operations.
DOK	1, 2, and/or 3 are eligible. DOK levels are designated on an item-by-item basis.
Context	Context Optional

Reporting Category	**EXPRESSIONS AND EQUATIONS**
Content Standard	***6.EE EXPRESSIONS AND EQUATIONS*** **Apply and extend previous understandings of arithmetic to algebraic expressions.** ***6.EE.2*** Write, read, and evaluate expressions in which letters stand for numbers. ***6.EE.2a*** Write expressions that record operations with numbers and with letters standing for numbers. *For example, express the calculation "Subtract y from 5" as 5 – y.* ***6.EE.2b*** Identify parts of an expression using mathematical terms (sum, term, product, factor, quotient, coefficient); view one or more parts of an expression as a single entity. *For example, describe the expression 2(8 + 7) as a product of two factors; view (8 + 7) as both a single entity and a sum of two terms.* ***6.EE.2c*** Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including those involving whole-number exponents, using the algebraic order of operations when there are no parentheses to specify a particular order. *For example, use the formulas $V = s^3$ and $A = 6s^2$ to find the volume and surface area of a cube with sides of length $s = {}^1/_2$.*
Content Limits	• Items will use positive rational numbers. • In 2a, real-world problems will be avoided. • In 2c, items may require the use of the order of operations. • Multiplication may be represented by a raised dot, parentheses, or a coefficient and a variable. • Division may be represented by a fraction bar or a division sign.
DOK	1, 2, and/or 3 are eligible. DOK levels are designated on an item-by-item basis.
Context	Context Optional

Reporting Category	**EXPRESSIONS AND EQUATIONS**
Content Standard	***6.EE EXPRESSIONS AND EQUATIONS*** **Apply and extend previous understandings of arithmetic to algebraic expressions.** ***6.EE.3*** Apply the properties of operations to generate equivalent expressions*. For example, apply the distributive property to the expression 3(2 + x) to produce the equivalent expression 6 + 3x; apply the distributive property to the expression 24x + 18y to produce the equivalent expression 6(4x + 3y); apply properties of operations to y + y + y to produce the equivalent expression 3y.*
Content Limits	• Items will use nonnegative rational numbers. • Expressions may include exponents. • Expressions must contain variables. • Items may require students to recognize the formal names of properties. • Property names will be used sparingly.
DOK	1, 2, and/or 3 are eligible. DOK levels are designated on an item-by-item basis.
Context	Context Optional

Reporting Category	**EXPRESSIONS AND EQUATIONS**
Content Standard	***6.EE EXPRESSIONS AND EQUATIONS*** **Apply and extend previous understandings of arithmetic to algebraic expressions.** ***6.EE.4*** Identify when two expressions are equivalent, i.e., when the two expressions name the same number regardless of which value is substituted into them. *For example, the expressions y + y + y and 3y are equivalent because they name the same number regardless of which number y stands for.*
Content Limits	• Items will use nonnegative rational numbers. • Expressions may include exponents. • Expressions must contain variables. • Items may require the use of the order of operations.
DOK	1, 2, and/or 3 are eligible. DOK levels are designated on an item-by-item basis.
Context	Context Optional

Reporting Category	**EXPRESSIONS AND EQUATIONS**
Content Standard	***6.EE EXPRESSIONS AND EQUATIONS*** **Reason about and solve one-variable equations and inequalities.** ***6.EE.5*** Understand solving an equation or inequality as a process of answering a question: which values from a specified set, if any, make the equation or inequality true? Use substitution to determine whether a given number in a specified set makes an equation or inequality true.
Content Limits	• Items will use nonnegative rational numbers. • Only one-variable linear equations and inequalities will be used. • An equation or inequality will be given. • Items will not require solving an equation or inequality. • Items will only use strict inequalities (not $x \leq c$ or $x \geq c$).
DOK	1, 2, and/or 3 are eligible. DOK levels are designated on an item-by-item basis.
Context	Context Optional

Reporting Category	**EXPRESSIONS AND EQUATIONS**
Content Standard	***6.EE EXPRESSIONS AND EQUATIONS*** **Reason about and solve one-variable equations and inequalities.** ***6.EE.6*** Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set.
Content Limits	• Items will use nonnegative rational numbers. • Expressions must contain variables. • Items will not require students to evaluate expressions.
DOK	1, 2, and/or 3 are eligible. DOK levels are designated on an item-by-item basis.
Context	Context Optional

Reporting Category	**EXPRESSIONS AND EQUATIONS**
Content Standard	***6.EE EXPRESSIONS AND EQUATIONS*** **Reason about and solve one-variable equations and inequalities.** ***6.EE.7*** Solve real-world and mathematical problems by writing and solving equations of the form $x + p = q$ and $px = q$ for cases in which p, q, and x are all nonnegative rational numbers.
Content Limits	• Items will use nonnegative rational numbers. • Items will use one-step equations of the form $x + p = q$, $x – p = q$, or $px = q$, where p, x, and q are nonnegative rational numbers using models or algebraically. • Items will use one-step equations of the form $\frac{x}{p} = q$ where x and q are nonnegative rational numbers and p is a positive integer using models and algebraically.
DOK	1, 2, and/or 3 are eligible. DOK levels are designated on an item-by-item basis.
Context	Context Optional

Reporting Category	**EXPRESSIONS AND EQUATIONS**
Content Standard	***6.EE EXPRESSIONS AND EQUATIONS*** **Reason about and solve one-variable equations and inequalities.** ***6.EE.8*** Write an inequality of the form $x > c$ or $x < c$ to represent a constraint or condition in a real-world or mathematical problem. Recognize that inequalities of the form $x > c$ or $x < c$ have infinitely many solutions; represent solutions of such inequalities on number line diagrams.
Content Limits	• Items will use nonnegative rational numbers. • Items will only use strict inequalities (not $x \leq c$ or $x \geq c$).
DOK	1, 2, and/or 3 are eligible. DOK levels are designated on an item-by-item basis.
Context	Context Optional

Reporting Category	**EXPRESSIONS AND EQUATIONS**
Content Standard	***6.EE EXPRESSIONS AND EQUATIONS*** **Represent and analyze quantitative relationships between dependent and independent variables.** ***6.EE.9*** Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation. *For example, in a problem involving motion at constant speed, list and graph ordered pairs of distances and times, and write the equation d = 65t to represent the relationship between distance and time.*
Content Limits	• Items will use nonnegative rational numbers. • Items will use one-step equations of the form $x + p = q$, $x - p = q$, or $px = q$, where p, x, and q are-nonnegative rational numbers using models or algebraically. • Items will use one-step equations of the form $\frac{x}{p} = q$ where x and q are nonnegative rational numbers and p is a positive integer using models and algebraically. • Items may require students to identify which variable is dependent or independent.
DOK	1, 2, and/or 3 are eligible. DOK levels are designated on an item-by-item basis.
Context	Context Required

Reporting Category	**GEOMETRY AND STATISTICS**
Content Standard	***6.NS THE NUMBER SYSTEM*** **Apply and extend previous understandings of numbers to the system of rational numbers.** ***6.NS.8*** Solve real-world and mathematical problems by graphing points in all four quadrants of the coordinate plane. Include use of coordinates and absolute value to find distances between points with the same first coordinate or the same second coordinate.
Content Limits	• Axes can be numbered with scales other than 1. • In items involving finding distances between two points, either the first coordinates or the second coordinates will be the same.
DOK	1, 2, and/or 3 are eligible. DOK levels are designated on an item-by-item basis.
Context	Context Optional

Reporting Category	**GEOMETRY AND STATISTICS**
Content Standard	***6.G GEOMETRY*** **Solve real-world and mathematical problems involving area, surface area, and volume.** ***6.G.1*** Through composition into rectangles or decomposition into triangles, find the area of right triangles, other triangles, special quadrilaterals, and polygons; apply these techniques in the context of solving real-world and mathematical problems.
Content Limits	• Items will use positive rational numbers. • Shapes will be limited to polygons that can be decomposed or composed into rectangles and/or triangles.
DOK	1, 2, and/or 3 are eligible. DOK levels are designated on an item-by-item basis.
Context	Context Optional

Reporting Category	**GEOMETRY AND STATISTICS**
Content Standard	***6.G GEOMETRY*** **Solve real-world and mathematical problems involving area, surface area, and volume.** ***6.G.2*** Find the volume of a right rectangular prism with fractional edge lengths by packing it with unit cubes of the appropriate unit fraction edge lengths, and show that the volume is the same as would be found by multiplying the edge lengths of the prism. Apply the formulas $V = \ell \cdot w \cdot h$ and $V = B \cdot h$ to find volumes of right rectangular prisms with fractional edge lengths in the context of solving real-world and mathematical problems.
Content Limits	• At least one side length must be a non-integer. • Fractional unit cubes will be limited to $\frac{1}{2}$ and $\frac{1}{4}$.
DOK	1, 2, and/or 3 are eligible. DOK levels are designated on an item-by-item basis.
Context	Context Optional

Reporting Category	**GEOMETRY AND STATISTICS**
Content Standard	***6.G GEOMETRY*** **Solve real-world and mathematical problems involving area, surface area, and volume.** ***6.G.3*** Draw polygons in the coordinate plane given coordinates for the vertices; use coordinates to find the length of a side joining points with the same first coordinate or the same second coordinate. Apply these techniques in the context of solving real-world and mathematical problems.
Content Limits	• Items may use all types of rational numbers. • The vertices of a polygon may be in different quadrants. • Students will not be expected to know the quadrant names (I, II, III, IV). Items can refer to the quadrant names but will include a diagram which labels the quadrants by number. • In items involving finding the distance between two points, either the first coordinates or the second coordinates will be the same. • Axes can be numbered with scales other than 1.
DOK	1, 2, and/or 3 are eligible. DOK levels are designated on an item-by-item basis.
Context	Context Optional

Reporting Category	**GEOMETRY AND STATISTICS**
Content Standard	***6.G GEOMETRY*** **Solve real-world and mathematical problems involving area, surface area, and volume.** ***6.G.4*** Represent three-dimensional figures using nets made up of rectangles and triangles, and use the nets to find the surface area of these figures. Apply these techniques in the context of solving real-world and mathematical problems.
Content Limits	• Only positive rational numbers will be used. • Nets will be composed of rectangles and triangles. • Solids will include right prisms and pyramids.
DOK	1, 2, and/or 3 are eligible. DOK levels are designated on an item-by-item basis.
Context	Context Optional

Reporting Category	**GEOMETRY AND STATISTICS**
Content Standard	***6.SP STATISTICS AND PROBABILITY*** **Develop understanding of statistical problem solving.** ***6.SP.1*** Develop statistical reasoning by using the GAISE model: ***a.*** Formulate Questions: Recognize and formulate a statistical question as one that anticipates variability and can be answered with quantitative data. *For example, "How old am I?" is not a statistical question, but "How old are the students in my school?" is a statistical question because of the variability in students' ages.* (GAISE Model, step 1) ***b.*** Collect Data: Design and use a plan to collect appropriate data to answer a statistical question. (GAISE Model, step 2) ***c.*** Analyze Data: Select appropriate graphical methods and numerical measures to analyze data by displaying variability within a group, comparing individual to individual, and comparing individual to group. (GAISE Model, step 3) ***d.*** Interpret Results: Draw logical conclusions from the data based on the original question. (GAISE Model, step 4)
Content Limits	• Items may use all types of rational numbers. • Items can be aligned to one step of the GAISE model or to multiple steps. • This standard will focus on steps b and d since steps a and c are assessed in other standards. • Items will focus on Level A of the GAISE model. • Items can test knowing the order of the four steps of the model.
DOK	1, 2, and/or 3 are eligible. DOK levels are designated on an item-by-item basis.
Context	Context Required

Reporting Category	**GEOMETRY AND STATISTICS**
Content Standard	***6.SP STATISTICS AND PROBABILITY*** **Develop understanding of statistical problem solving.** ***6.SP.2*** Understand that a set of data collected to answer a statistical question has a distribution which can be described by its center, spread, and overall shape.
Content Limits	• Nonnegative rational numbers will be used. • Visual data displays are limited to dot plots (line plots), histograms, and box plots.
DOK	1, 2, and/or 3 are eligible. DOK levels are designated on an item-by-item basis.
Context	Context Optional

Reporting Category	**GEOMETRY AND STATISTICS**
Content Standard	***6.SP STATISTICS AND PROBABILITY*** **Develop understanding of statistical problem solving.** ***6.SP.3*** Recognize that a measure of center for a numerical data set summarizes all of its values with a single number, while a measure of variation describes how its values vary with a single number.
Content Limits	• Nonnegative rational numbers will be used. • Only numerical data sets will be used. • Items may require knowledge of mean and median as measures of center. • Items may require knowledge of range and interquartile range as measures of variation.
DOK	1, 2, and/or 3 are eligible. DOK levels are designated on an item-by-item basis.
Context	Context Optional

Reporting Category	**GEOMETRY AND STATISTICS**
Content Standard	***6.SP STATISTICS AND PROBABILITY*** **Summarize and describe distributions.** ***6.SP.4*** Display numerical data in plots on a number line, including dot plots (line plots), histograms, and box plots. (GAISE Model, step 3)
Content Limits	• Items will use nonnegative rational numbers. • Plots are limited to dot plots (line plots), histograms, and box plots. • Items will focus on Level A of the GAISE model.
DOK	1, 2, and/or 3 are eligible. DOK levels are designated on an item-by-item basis.
Context	Context Optional

Reporting Category	**GEOMETRY AND STATISTICS**
Content Standard	***6.SP STATISTICS AND PROBABILITY*** **Summarize and describe distributions.** ***6.SP.5*** Summarize numerical data sets in relation to their context. ***6.SP.5a*** Report the number of observations. ***6.SP.5b*** Describe the nature of the attribute under investigation, including how it was measured and its units of measurement. ***6.SP.5c*** Find the quantitative measures of center (median and/or mean) for a numerical data set and recognize that this value summarizes the data set with a single number. Interpret mean as an equal or fair share. Find measures of variability (range and interquartile range) as well as informally describe the shape and the presence of clusters, gaps, peaks, and outliers in a distribution. ***6.SP.5d*** Choose the measures of center and variability, based on the shape of the data distribution and the context in which the data were gathered.
Content Limits	• Nonnegative rational numbers will be used. • Visual data displays are limited to dot plots (line plots), histograms, and box plots. • Items may require knowledge of mean and median as measures of center. • Items may require knowledge of range and interquartile range as measures of variation. • Items will focus on GAISE Level A.
DOK	1, 2, and/or 3 are eligible. DOK levels are designated on an item-by-item basis.
Context	Context Required

Reporting Category	**THE NUMBER SYSTEM**
Content Standard	***6.NS THE NUMBER SYSTEM*** **Apply and extend previous understandings of multiplication and division to divide fractions by fractions.** ***6.NS.1*** Interpret and compute quotients of fractions, and solve word problems involving division of fractions by fractions, e.g., by using visual fraction models and equations to represent the problem. *For example, create a story context for $(2/3) \div (3/4)$ and use a visual fraction model to show the quotient; use the relationship between multiplication and division to explain that $(2/3) \div (3/4) = 8/9$ because $3/4$ of $8/9$ is $2/3$. (In general, $(a/b) \div (c/d) = ad/bc$.) How much chocolate will each person get if 3 people share $1/2$ pound of chocolate equally? How many $3/4$ cup servings are in $2/3$ of a cup of yogurt? How wide is a rectangular strip of land with length $3/4$ mi and area $1/2$ square mi?*
Content Limits	• Either the divisor or the dividend must be a non-unit fraction. • The focus will be on interpreting and using visual models. • Language such as “reduce”, “simplify”, or “lowest terms” will not be used.
DOK	1, 2, and/or 3 are eligible. DOK levels are designated on an item-by-item basis.
Context	Context Optional

Reporting Category	**THE NUMBER SYSTEM**
Content Standard	***6.NS THE NUMBER SYSTEM*** **Compute fluently with multi-digit numbers and find common factors and multiples.** ***6.NS.2*** Fluently divide multi-digit numbers using a standard algorithm.
Content Limits	• For items with a context, division is limited to 2 digits by 1, 3 digits by 1, 3 digits by 2, 4 digits by 2, 5 digits by 2, or 3 digits by 3. • For items without a context, division is limited to 2 digits by 1, 3 digits by 1, 3 digits by 2, 4 digits by 2, 5 digits by 2. • Students will never have a calculator for items aligned to this standard.
DOK	1, 2, and/or 3 are eligible. DOK levels are designated on an item-by-item basis.
Context	Context Optional

Reporting Category	**THE NUMBER SYSTEM**
Content Standard	***6.NS THE NUMBER SYSTEM*** **Compute fluently with multi-digit numbers and find common factors and multiples.** ***6.NS.3*** Fluently add, subtract, multiply, and divide multi-digit decimals using a standard algorithm for each operation.
Content Limits	• For items with a context, division is limited to 2 digits by 1, 3 digits by 1, 3 digits by 2, 4 digits by 2, 5 digits by 2, or 3 digits by 3. • For items without a context, division is limited to 2 digits by 1, 3 digits by 1, 3 digits by 2, 4 digits by 2, 5 digits by 2. • Items may require the use of the order of operations. • Students will never have a calculator for items aligned to this standard.
DOK	1, 2, and/or 3 are eligible. DOK levels are designated on an item-by-item basis.
Context	Context Optional

Reporting Category	**THE NUMBER SYSTEM**
Content Standard	***6.NS THE NUMBER SYSTEM*** **Compute fluently with multi-digit numbers and find common factors and multiples.** ***6.NS.4*** Find the greatest common factor of two whole numbers less than or equal to 100 and the least common multiple of two whole numbers less than or equal to 12. Use the distributive property to express a sum of two whole numbers 1-100 with a common factor as a multiple of a sum of two whole numbers with no common factor. *For example, express 36 + 8 as 4 (9 + 2).*
Content Limits	• When finding the greatest common factor, whole numbers less than or equal to 100 will be used. • When finding the least common multiple, whole numbers less than or equal to 12 will be used. • Students may need to know the name of the distributive property. • Students need to recognize the formal names of properties.
DOK	1, 2, and/or 3 are eligible. DOK levels are designated on an item-by-item basis.
Context	Context Optional

Reporting Category	**THE NUMBER SYSTEM**
Content Standard	***6.NS THE NUMBER SYSTEM*** **Apply and extend previous understandings of numbers to the system of rational numbers.** ***6.NS.5*** Understand that positive and negative numbers are used together to describe quantities having opposite directions or values, e.g., temperature above/below zero, elevation above/below sea level, credits/debits, positive/negative electric charge; use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation.
Content Limits	• Items may use all types of rational numbers. • Items will not require the student to perform an operation.
DOK	1, 2, and/or 3 are eligible. DOK levels are designated on an item-by-item basis.
Context	Context Required

Reporting Category	**THE NUMBER SYSTEM**
Content Standard	***6.NS THE NUMBER SYSTEM*** **Apply and extend previous understandings of numbers to the system of rational numbers.** ***6.NS.6*** Understand a rational number as a point on the number line. Extend number line diagrams and coordinate axes familiar from previous grades to represent points on the line and in the plane with negative number coordinates. ***6.NS.6a*** Recognize opposite signs of numbers as indicating locations on opposite sides of 0 on the number line; recognize that the opposite of the opposite of a number is the number itself, e.g., – (–3) = 3, and that 0 is its own opposite. ***6.NS.6b*** Understand signs of numbers in ordered pairs as indicating locations in quadrants of the coordinate plane; recognize that when two ordered pairs differ only by signs, the locations of the points are related by reflections across one or both axes. ***6.NS.6c*** Find and position integers and other rational numbers on a horizontal or vertical number line diagram; find and position pairs of integers and other rational numbers on a coordinate plane.
Content Limits	• Items may use all types of rational numbers. • Plotting of points in the coordinate plane will include negative values (not just first quadrant). • Students should not be expected to know the quadrant names (I, II, III, IV). Items can refer to the quadrant names but should include a diagram which labels the quadrants by number.
DOK	1, 2, and/or 3 are eligible. DOK levels are designated on an item-by-item basis.
Context	Context Optional

Reporting Category	**THE NUMBER SYSTEM**
Content Standard	***6.NS THE NUMBER SYSTEM*** **Apply and extend previous understandings of numbers to the system of rational numbers.** ***6.NS.7*** Understand ordering and absolute value of rational numbers. ***6.NS.7a*** Interpret statements of inequality as statements about the relative position of two numbers on a number line diagram. *For example, interpret −3 > −7 as a statement that −3 is located to the right of −7 on a number line oriented from left to right.* ***6.NS.7b*** Write, interpret, and explain statements of order for rational numbers in real-world contexts. *For example, write −3 °C > −7 °C to express the fact that −3 °C is warmer than −7 °C.* ***6.NS.7c*** Understand the absolute value of a rational number as its distance from 0 on the number line; interpret absolute value as magnitude for a positive or negative quantity in a real-world situation. *For example, for an account balance of −30 dollars, write |−30| = 30 to describe the size of the debt in dollars.* ***6.NS.7d*** Distinguish comparisons of absolute value from statements about order. *For example, recognize that an account balance less than −30 dollars represents a debt greater than 30 dollars.*
Content Limits	• Items will use positive and negative rational numbers. • Items will only use strict inequalities (not $x \leq c$ or $x \geq c$). • In items involving finding the distance between two points, either the first coordinates or the second coordinates will be the same. • Items will not involve multiplication or division of negative numbers.
DOK	1, 2, and/or 3 are eligible. DOK levels are designated on an item-by-item basis.
Context	Context Optional