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 5 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 the categories for reporting test results for Grade 5.

Reporting Category	Standards				Approximate Portion of Test
Fractions	5.NF.1	5.NF.3	5.NF.5	5.NF.7	33% – 43% 17 – 21 points
	5.NF.2	5.NF.4	5.NF.6	5.MD.2	
Decimals	5.OA.1	5.NBT.2	5.NBT.5	5.MD.1	33% – 43% 17 – 21 points
	5.OA.2	5.NBT.3	5.NBT.6		
	5.NBT.1	5.NBT.4	5.NBT.7		
Geometry	5.MD.3	5.MD.5	5.G.1	5.G.3	21% – 27% 11 – 13 points
	5.MD.4	5.OA.3	5.G.2	5.G.4	
				Total Test	49 – 51 points

Modeling and Reasoning*
(minimum 20%)

Depth of Knowledge (DOK) Level	Approximate Portion of Test
1	9 – 16 points
2	23 – 33 points
3	5 – 13 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.
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.

Interaction Type	Description
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.
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.

Interaction Type	Description
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	**FRACTIONS**
Content Standard	***5.NF NUMBERS AND OPERATIONS–FRACTIONS*** **Use equivalent fractions as a strategy to add and subtract fractions. (Fractions need not be simplified).** ***5.NF.1*** Add and subtract fractions with unlike denominators (including mixed numbers and fractions greater than 1) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators. *For example, use visual models and properties of operations to show* $^{2}/_{3} + {}^{5}/_{4} = {}^{8}/_{12} + {}^{15}/_{12} = {}^{23}/_{12}$. *In general,* $^{a}/_{b} + {}^{c}/_{d} = ({}^{a}/_{b} \times {}^{d}/_{d}) + ({}^{c}/_{d} \times {}^{b}/_{b}) = {}^{(ad + bc)}/_{bd}$.
Content Limits	• Fractions may exceed one whole. • Fractions must refer to the same whole. • Addition and subtraction with mixed numbers may contain up to three-digit whole numbers and fractions up to hundredths (inclusive). • Area models (e.g., circles, rectangles, squares, etc.) and length models (e.g., fraction strips or bars, number lines, etc.) may be used to represent fractions. • Excludes use of language such as “reduce”, “simplify”, or “lowest terms”. • Excludes requirement to know, recognize, or use the formal name of any property.
DOK	1, 2, and/or 3 are eligible. DOK levels are designated on an item-by-item basis.
Context	Context Optional

Reporting Category	**FRACTIONS**
Content Standard	***5.NF NUMBERS AND OPERATIONS–FRACTIONS*** **Use equivalent fractions as a strategy to add and subtract fractions. (Fractions need not be simplified).** ***5.NF.2*** Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators, e.g., by using visual fraction models or equations to represent the problem. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers. *For example, recognize an incorrect result* $^2/_5 + {}^1/_2 = {}^3/_7$*, by observing that* $^3/_7 < {}^1/_2$*.*
Content Limits	• Fractions may exceed one whole. • Fractions must refer to the same whole. • Benchmark fractions are limited to 0, $\frac{1}{2}$, and 1. • Addition and subtraction with mixed numbers may contain up to three-digit whole numbers and fractions up to hundredths (inclusive). • Addition and subtraction situations may include add to, take from, pull together, take apart, and comparison. [See Table 1]* • Area models (e.g., circles, rectangles, squares, etc.) and length models (e.g., fraction strips or bars, number lines, etc.) may be used to represent fractions. • Excludes use of language such as “reduce”, “simplify”, or “lowest terms”.
DOK	1, 2, and/or 3 are eligible. DOK levels are designated on an item-by-item basis.
Context	Context Required

*Table 1 is located on pg. 95 of the Ohio Learning Standards for Mathematics

Reporting Category	**FRACTIONS**
Content Standard	***5.NF NUMBERS AND OPERATIONS–FRACTIONS*** **Apply and extend previous understandings of multiplication and division to multiply and divide fractions. (Fractions need not be simplified).** ***5.NF.3*** Interpret a fraction as division of the numerator by the denominator ($^{a}/_{b} = a \div b$). Solve word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers, e.g., by using visual fraction models or equations to represent the problem. *For example, interpret $^{3}/_{4}$ as the result of dividing 3 by 4, noting that $^{3}/_{4}$ multiplied by 4 equals 3, and that when 3 wholes are shared equally among 4 people each person has a share of size $^{3}/_{4}$. If 9 people want to share a 50 pound sack of rice equally by weight, how many pounds of rice should each person get? Between what two whole numbers does your answer lie?*
Content Limits	• Divisor and dividend must be whole numbers greater than zero. • Division may be up to four-digit dividends and two-digit divisors. • Quotients may be greater than 1. • Division situations are limited to equal groups. [See Table 2]* • Area models (e.g., circles, rectangles, squares, etc.) and length models (e.g., fraction strips or bars, number lines, etc.) may be used to represent fractions. • Excludes division situations involving arrays, area, and comparison problems. [See Table 2]* • Excludes use of language such as “reduce”, “simplify”, or “lowest terms”.
DOK	1, 2, and/or 3 are eligible. DOK levels are designated on an item-by-item basis.
Context	Context Optional

*Table 2 is located on pg. 96 of the Ohio Learning Standards for Mathematics

Reporting Category	**FRACTIONS**
Content Standard	***5.NF NUMBERS AND OPERATIONS–FRACTIONS*** **Apply and extend previous understandings of multiplication and division to multiply and divide fractions. (Fractions need not be simplified).** ***5.NF.4*** Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction. ***5.NF.4a*** Interpret the product $(^{a}/_{b}) \times q$ as a parts of a partition of q into b equal parts, equivalently, as the result of a sequence of operations $a \times q \div b$. *For example, use a visual fraction model to show* $(^{2}/_{3}) \times 4 = {}^{8}/_{3}$*, and create a story context for this equation. Do the same with* $(^{2}/_{3}) \times (^{4}/_{5}) = {}^{8}/_{15}$*. (In general,* $(^{a}/_{b}) \times (^{c}/_{d}) = {}^{ac}/_{bd}$*.)* ***5.NF.4b*** Find the area of a rectangle with fractional side lengths by tiling it with unit squares of the appropriate unit fraction side lengths, and show that the area is the same as would be found by multiplying the side lengths. Multiply fractional side lengths to find areas of rectangles, and represent fraction products as rectangular areas.
Content Limits	• Fractions may exceed one whole. • Fractions must refer to the same whole. • Multiplication with fractions may contain fractions up to the hundredths (inclusive) and whole numbers up to three digits. • Multiplication situations may include equal groups, arrays, area, and comparison problems. [See Table 2]* • Area models (e.g., rectangles or squares) may be used. • Excludes use of language such as “reduce”, “simplify”, or “lowest terms”. • Excludes use of exponential notation for units.
DOK	1, 2, and/or 3 are eligible. DOK levels are designated on an item-by-item basis.
Context	Context Optional

*Table 2 is located on pg. 96 of the Ohio Learning Standards for Mathematics

Reporting Category	**FRACTIONS**
Content Standard	***5.NF NUMBERS AND OPERATIONS–FRACTIONS*** **Apply and extend previous understandings of multiplication and division to multiply and divide fractions. (Fractions need not be simplified).** ***5.NF.5*** Interpret multiplication as scaling (resizing). ***5.NF.5a*** Compare the size of a product to the size of one factor on the basis of the size of the other factor, without performing the indicated multiplication. ***5.NF.5b*** Explain why multiplying a given number by a fraction greater than 1 results in a product greater than the given number (recognizing multiplication by whole numbers greater than 1 as a familiar case); explaining why multiplying a given number by a fraction less than 1 results in a product smaller than the given number; and relating the principle of fraction equivalence $^{a}/_{b} = {}^{(n\times a)}/_{(n\times b)}$ to the effect of multiplying $^{a}/_{b}$ by 1.
Content Limits	• Fractions may exceed one whole. • Fractions must refer to the same whole. • Multiplication with fractions may contain fractions up to the hundredths (inclusive) and whole numbers up to three digits. • Multiplication situations may include equal groups, arrays, area, and comparison problems. [See Table 2]* • Excludes any requirement to perform the indicated multiplication. • Excludes use of language such as “reduce”, “simplify”, or “lowest terms”.
DOK	1, 2, and/or 3 are eligible. DOK levels are designated on an item-by-item basis.
Context	Context Optional

*Table 2 is located on pg. 96 of the Ohio Learning Standards for Mathematics

Reporting Category	**FRACTIONS**
Content Standard	***5.NF NUMBERS AND OPERATIONS–FRACTIONS*** **Apply and extend previous understandings of multiplication and division to multiply and divide fractions. (Fractions need not be simplified).** ***5.NF.6*** Solve real-world problems involving multiplication of fractions and mixed numbers, e.g., by using visual fraction models or equations to represent the problem.
Content Limits	• Fractions may exceed one whole. • Fractions must refer to the same whole. • Multiplication with fractions may contain fractions up to the hundredths (inclusive) and whole numbers up to three digits. • Multiplication situations may include equal groups, arrays, area, and comparison problems. [See Table 2]* • Area models (e.g., circles, rectangles, squares, etc.) and length models (e.g., fraction strips or bars, number lines, etc.) may be used to represent fractions. • Excludes use of language such as “reduce”, “simplify”, or “lowest terms”.
DOK	1, 2, and/or 3 are eligible. DOK levels are designated on an item-by-item basis.
Context	Context Required

*Table 2 is located on pg. 96 of the Ohio Learning Standards for Mathematics

Reporting Category	**FRACTIONS**
Content Standard	***5.NF NUMBERS AND OPERATIONS–FRACTIONS*** **Apply and extend previous understandings of multiplication and division to multiply and divide fractions. (Fractions need not be simplified).** ***5.NF.7*** Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions. In general, students able to multiply fractions can develop strategies to divide fractions, by reasoning about the relationship between multiplication and division, but division of a fraction by a fraction is not a requirement at this grade. ***5.NF.7a*** Interpret division of a unit fraction by a non-zero whole number, and compute such quotients. *For example, create a story context for $(1/3) \div 4$, and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that $(1/3) \div 4 = (1/12)$ because $(1/12) \times 4 = (1/3)$.* ***5.NF.7b*** Interpret division of a whole number by a unit fraction, and compute such quotients. *For example, create a story context for $4 \div (1/5)$, and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that $4 \div (1/5) = 20$ because $20 \times (1/5) = 4$.* ***5.NF.7c*** Solve real-world problems involving division of unit fractions by non-zero whole numbers and division of whole numbers by unit fractions, e.g., by using visual fraction models and equations to represent the problem. *For example, how much chocolate will each person get if 3 people share $1/2$ pound of chocolate equally? How many $1/3$ cup servings are in 2 cups of raisins?*
Content Limits	• Division may contain whole numbers up to two digits and unit fractions through the hundredths. • Division situations may include equal groups, arrays, area, and comparison problems. [See Table 2]* • Area models (e.g., circles, rectangles, squares, etc.) and length models (e.g., fraction strips or bars, number lines, etc.) may be used to represent fractions. • Excludes use of language such as “reduce”, “simplify”, or “lowest terms”.
DOK	1, 2, and/or 3 are eligible. DOK levels are designated on an item-by-item basis.
Context	Context Optional

*Table 2 is located on pg. 96 of the Ohio Learning Standards for Mathematics

Reporting Category	**FRACTIONS**
Content Standard	***5.MD MEASUREMENT AND DATA*** **Convert like measurement units within a given measurement system.** ***5.MD.2*** Display and interpret data in graphs (picture graphs, bar graphs, and line plots) to solve problems using numbers and operations for this grade, e.g., including U.S. customary units in fractions $^1/_2$, $^1/_4$, $^1/_8$, or decimals.
Content Limits	General: • Graphs are limited to picture graphs, bar graphs, and line plots. • The given scale of a line plot can be whole numbers, halves, quarters, eighths, sixteenths, tenths, or hundredths. • The scale of a bar graph and picture graph varies depending on the data set. • Data sets may include money, metric, and U.S customary measures. For fractions: • Addition and subtraction of fractions may contain like and unlike denominators. • Addition and subtraction with mixed numbers may contain up to three-digit whole numbers and fractions up to hundredths (inclusive). • Multiplication with fractions may contain fractions up to the hundredths (inclusive) and whole numbers up to three digits. • Division may contain whole numbers up to two digits and unit fractions through the hundredths. For decimals: • Addition and subtraction with decimals may contain up to three-digit whole numbers and decimals through the hundredths place (inclusive). • Multiplication with decimals may contain up to three-digit whole numbers and decimals through the hundredths place (inclusive). • Division with decimals may contain whole numbers up to two digits and decimals less than one through the hundredths place (inclusive).
DOK	1, 2, and/or 3 are eligible. DOK levels are designated on an item-by-item basis.
Context	Context Optional

Reporting Category	**DECIMALS**
Content Standard	***5.OA OPERATIONS AND ALGEBRAIC THINKING*** **Write and interpret numerical expressions.** ***5.OA.1*** Use parentheses in numerical expressions, and evaluate expressions with this symbol. Formal use of algebraic order of operations is not necessary.
Content Limits	• Grouping symbols limited to parentheses. • Expressions may contain up to three operations. • Multiplication may contain whole numbers up to four digits by two digits. • Division may contain whole numbers up to four-digit dividends and two-digit divisors. • Numerical expressions may include whole numbers, fractions, and decimals. • Excludes exponents and powers of 10. • Excludes use of nested grouping symbols.
DOK	1, 2, and/or 3 are eligible. DOK levels are designated on an item-by-item basis.
Context	Context Optional

Reporting Category	**DECIMALS**
Content Standard	***5.OA OPERATIONS AND ALGEBRAIC THINKING*** **Write and interpret numerical expressions.** ***5.OA.2*** Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them. *For example, express the calculation "add 8 and 7, then multiply by 2" as 2 × (8 + 7). Recognize that 3 × (18,932 + 921) is three times as large as 18,932 + 921, without having to calculate the indicated sum or product.*
Content Limits	• Grouping symbols limited to parentheses. • Expressions may contain up to three operations. • Multiplication may contain whole numbers up to four digits by two digits. • Division may contain whole numbers up to four-digit dividends and two-digit divisors. • Numerical expressions may include whole numbers, fractions, and decimals. • Excludes exponents and powers of 10. • Excludes use of nested grouping symbols.
DOK	1, 2, and/or 3 are eligible. DOK levels are designated on an item-by-item basis.
Context	Context Optional

Reporting Category	**DECIMALS**
Content Standard	***5.NBT NUMBERS AND OPERATIONS IN BASE TEN*** **Understand the place value system.** ***5.NBT.1*** Recognize that in a multi-digit number, a digit in one place represents 10 times as much as it represents in the place to its right and $^{1}/_{10}$ of what it represents in the place to its left.
Content Limits	• Place values in the number system are limited to whole numbers to the millions (inclusive) and decimals to the thousandths (inclusive). • Comparisons may be more than one place value apart from each other.
DOK	1, 2, and/or 3 are eligible. DOK levels are designated on an item-by-item basis.
Context	Context Optional

Reporting Category	**DECIMALS**
Content Standard	***5.NBT NUMBERS AND OPERATIONS IN BASE TEN*** **Understand the place value system.** ***5.NBT.2*** Explain patterns in the number of zeros of the product when multiplying a number by powers of 10, and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10. Use whole-number exponents to denote powers of 10.
Content Limits	• Limited to positive whole-number exponents with a base of ten. • Limited to products through millions.
DOK	1, 2, and/or 3 are eligible. DOK levels are designated on an item-by-item basis.
Context	Context Optional

Reporting Category	**DECIMALS**
Content Standard	***5.NBT NUMBERS AND OPERATIONS IN BASE TEN*** **Understand the place value system.** ***5.NBT.3*** Read, write, and compare decimals to thousandths. ***5.NBT.3a*** Read and write decimals to thousandths using base-ten numerals, number names, and expanded form, e.g., $347.392 = 3 \times 100 + 4 \times 10 + 7 \times 1 + 3 \times (1/10) + 9 \times (1/100) + 2 \times (1/1000)$. ***5.NBT.3b*** Compare two decimals to thousandths based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons.
Content Limits	• Limited to whole numbers to the millions (inclusive) and decimals to the thousandths (inclusive). • Only the symbols <, =, or > may be used to compare multi-digit numbers. • Comparisons may contain: ○ the same number of digits; ○ the same leading digits; ○ different leading digits and different number of digits; or ○ the same whole number value and different decimal values.
DOK	1, 2, and/or 3 are eligible. DOK levels are designated on an item-by-item basis.
Context	Context Optional

Reporting Category	**DECIMALS**
Content Standard	***5.NBT NUMBERS AND OPERATIONS IN BASE TEN*** **Understand the place value system.** ***5.NBT.4*** Use place value understanding to round decimals to any place, millions through hundredths.
Content Limits	• Numbers in problems must contain a decimal. • Rounding is limited to any whole number place value through millions (inclusive) or any decimal place value through hundredths (inclusive).
DOK	1, 2, and/or 3 are eligible. DOK levels are designated on an item-by-item basis.
Context	Context Optional

Reporting Category	**DECIMALS**
Content Standard	***5.NBT NUMBERS AND OPERATIONS IN BASE TEN*** **Perform operations with multi-digit whole numbers and with decimals to hundredths.** ***5.NBT.5*** Fluently multiply multi-digit whole numbers using a standard algorithm.
Content Limits	• Multiplication may contain whole numbers up to four digits by two digits.
DOK	1, 2, and/or 3 are eligible. DOK levels are designated on an item-by-item basis.
Context	Context Optional

Reporting Category	**DECIMALS**
Content Standard	***5.NBT NUMBERS AND OPERATIONS IN BASE TEN*** **Perform operations with multi-digit whole numbers and with decimals to hundredths.** ***5.NBT.6*** Find whole-number quotients of whole numbers with up to four-digit dividends and two-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.
Content Limits	• Dividend, divisor, and quotient must be whole numbers. • Division may contain whole numbers with up to four-digit dividends and two-digit divisors. • Division situations may include equal groups, arrays, area, and comparison problems. [See Table 2]* • Excludes requirement to know, recognize, or use the formal name of any property.
DOK	1, 2, and/or 3 are eligible. DOK levels are designated on an item-by-item basis.
Context	Context Optional

*Table 2 is located on pg. 96 of the Ohio Learning Standards for Mathematics

Reporting Category	**DECIMALS**
Content Standard	***5.NBT NUMBERS AND OPERATIONS IN BASE TEN*** **Perform operations with multi-digit whole numbers and with decimals to hundredths.** ***5.NBT.7*** Solve real-world problems by adding, subtracting, multiplying, and dividing decimals using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction, or multiplication and division; relate the strategy to a written method and explain the reasoning used. ***5.NBT.7a*** Add and subtract decimals, including decimals with whole numbers, (whole numbers through the hundreds place and decimals through the hundredths place). ***5.NBT.7b*** Multiply whole numbers by decimals (whole numbers through the hundreds place and decimals through the hundredths place). ***5.NBT.7c*** Divide whole numbers by decimals and decimals by whole numbers (whole numbers through the tens place and decimals less than one through the hundredths place using numbers whose division can be readily modeled). *For example, 0.75 divided by 5, 18 divided by 0.6, or 0.9 divided by 3.*
Content Limits	• Contexts may include the application of metric conversions from Grade 4. • Area models (e.g., rectangles, squares, etc.) and length models (e.g., fraction strips or bars, number lines, etc.) may be used to represent decimals. • Addition and subtraction with decimals may contain up to three-digit whole numbers and decimals through the hundredths place (inclusive). • Multiplication with decimals may contain up to three-digit whole numbers and decimals through the hundredths place (inclusive). • Multiplication may contain whole numbers up to four digits by two digits. • Division with decimals may contain whole numbers up to two digits and decimals less than one through the hundredths place (inclusive). • Addition and subtraction situations may include add to, take from, pull together, take apart, and comparison. [See Table 1]* • Multiplication and division situations may include equal groups, arrays, area, and comparison problems. [See Table 2]* • Excludes requirement to know, recognize, or use the formal name of any property.
DOK	1, 2, and/or 3 are eligible. DOK levels are designated on an item-by-item basis.
Context	Context Required

*Table 1 is located on pg. 95 of the Ohio Learning Standards for Mathematics

*Table 2 is located on pg. 96 of the Ohio Learning Standards for Mathematics

Reporting Category	**DECIMALS**
Content Standard	***5.MD MEASUREMENT AND DATA*** **Convert like measurement units within a given measurement system.** ***5.MD.1*** Know relative sizes of these U.S. customary measurement units: pounds, ounces, miles, yards, feet, inches, gallons, quarts, pints, cups, fluid ounces, hours, minutes, and seconds. Convert between pounds and ounces; miles and feet; yards, feet, and inches; gallons, quarts, pints, cups, and fluid ounces; hours, minutes, and seconds in solving multi-step, real-world problems.
Content Limits	• Limited to measurement conversions within the U.S. customary system. • Measurement conversions may be from larger units to smaller units or smaller units to larger units. • Limited to conversions between units using these conversions: ○ 1 pound = 16 ounces, ○ 1 mile = 5,280 feet, ○ 1 yard = 3 feet; 1 foot = 12 inches; 1 yard = 36 inches, ○ 1 gallon = 4 quarts or 8 pints or 16 cups or 128 fluid ounces, ○ 1 quart = 2 pints or 4 cups or 32 fluid ounces, ○ 1 pint = 2 cups or 16 fluid ounces, ○ 1 cup = 8 fluid ounces, and ○ 1 hour = 60 minutes; 1 minute = 60 seconds; 1 hour = 3,600 seconds. • Multiplication may be up to four digits by two digits. • Division may be up to four-digit dividends and two-digit divisors. • Excludes metric conversions. Applications of metric conversions from Grade 4 are an appropriate real-world context eligible to be assessed in 5.NBT.7.
DOK	1, 2, and/or 3 are eligible. DOK levels are designated on an item-by-item basis.
Context	Context Optional

Reporting Category	**GEOMETRY**
Content Standard	***5.MD MEASUREMENT AND DATA*** **Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition.** ***5.MD.3*** Recognize volume as an attribute of solid figures and understand concepts of volume measurement. ***5.MD.3a*** A cube with side length 1 unit, called a "unit cube," is said to have "one cubic unit" of volume, and can be used to measure volume. ***5.MD.3b*** A solid figure which can be packed without gaps or overlaps using *n* unit cubes is said to have a volume of *n* cubic units.
Content Limits	• Solid figures are limited to right rectangular prisms with whole number side lengths. • Excludes use of exponential notation for units.
DOK	1, 2, and/or 3 are eligible. DOK levels are designated on an item-by-item basis.
Context	Context Optional

Reporting Category	**GEOMETRY**
Content Standard	***5.MD MEASUREMENT AND DATA*** **Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition.** ***5.MD.4*** Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and improvised units.
Content Limits	• Rectangular prisms must be given as an image. • Solid figures are limited to right rectangular prisms with whole number side lengths. • Multiplication may contain whole numbers up to four digits by two digits. • Excludes use of exponential notation for units.
DOK	1, 2, and/or 3 are eligible. DOK levels are designated on an item-by-item basis.
Context	Context Optional

Reporting Category	**GEOMETRY**
Content Standard	***5.MD MEASUREMENT AND DATA*** **Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition.** ***5.MD.5*** Relate volume to the operations of multiplication and addition and solve real-world and mathematical problems involving volume. ***5.MD.5a*** Find the volume of a right rectangular prism with whole-number side lengths by packing it with unit cubes, and show that the volume is the same as would be found by multiplying the edge lengths, equivalently by multiplying the height by the area of the base. Represent threefold whole-number products as volumes, e.g., to represent the Associative Property of Multiplication. ***5.MD.5b*** Apply the formulas $V = \ell \times w \times h$ and $V = B \times h$ for rectangular prisms to find volumes of right rectangular prisms with whole-number edge lengths in the context of solving real-world and mathematical problems. ***5.MD.5c*** Recognize volume as additive. Find volumes of solid figures composed of two non-overlapping right rectangular prisms by adding the volumes of the non-overlapping parts, applying this technique to solve real-world problems.
Content Limits	• Solid figures limited to whole number side lengths. • Composite shapes must be made up of two right rectangular prisms. • Multiplication may contain whole numbers up to four digits by two digits. • Excludes use of exponential notation for units.
DOK	1, 2, and/or 3 are eligible. DOK levels are designated on an item-by-item basis.
Context	Context Optional

Reporting Category	**GEOMETRY**
Content Standard	***5.OA OPERATIONS AND ALGEBRAIC THINKING*** **Analyze patterns and relationships.** ***5.OA.3*** Generate two numerical patterns using two given rules. Identify apparent relationships between corresponding terms. Form ordered pairs consisting of corresponding terms from the two patterns, and graph the ordered pairs on a coordinate plane. *For example, given the rule "Add 3" and the starting number 0, and given the rule "Add 6" and the starting number 0, generate terms in the resulting sequences, and observe that the terms in one sequence are twice the corresponding terms in the other sequence. Explain informally why this is so.*
Content Limits	• Rules for the numerical patterns must be given. • Patterns are limited to growing or repeating patterns. • Limited to Quadrant I of the coordinate plane. • Limited to whole number coordinate pairs. • Multiplication may contain whole numbers up to four digits by two digits. • Excludes exponential growth.
DOK	1, 2, and/or 3 are eligible. DOK levels are designated on an item-by-item basis.
Context	Context Optional

Reporting Category	**GEOMETRY**
Content Standard	***5.G GEOMETRY*** **Graph points on the coordinate plane to solve real-world and mathematical problems.** ***5.G.1*** Use a pair of perpendicular number lines, called axes, to define a coordinate system, with the intersection of the lines (the origin) arranged to coincide with the 0 on each line and a given point in the plane located by using an ordered pair of numbers, called its coordinates. Understand that the first number indicates how far to travel from the origin in the direction of one axis, and the second number indicates how far to travel in the direction of the second axis, with the convention that the names of the two axes and the coordinates correspond, e.g., *x*-axis and *x*-coordinate, *y*-axis and *y*-coordinate.
Content Limits	• Limited to Quadrant I of the coordinate plane. • Limited to whole number coordinate pairs. • Scales on the axes may be greater 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**
Content Standard	***5.G GEOMETRY*** **Graph points on the coordinate plane to solve real-world and mathematical problems.** ***5.G.2*** Represent real-world and mathematical problems by graphing points in the first quadrant of the coordinate plane, and interpret coordinate values of points in the context of the situation.
Content Limits	• Limited to Quadrant I of the coordinate plane. • Limited to whole number coordinate pairs. • Scales on the axes may be greater 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**
Content Standard	***5.G GEOMETRY*** **Classify two-dimensional figures into categories based on their properties.** ***5.G.3*** Identify and describe commonalities and differences between types of triangles based on angle measures (equiangular, right, acute, and obtuse triangles) and side lengths (isosceles, equilateral, and scalene triangles).
Content Limits	• Limited to triangles. • Limited to Van Hiele Levels 0 (visualization) and 1 (analysis). • Angle measures limited to visual recognition of equiangular, acute, right, or obtuse angles. • Isosceles triangles must allow both the inclusive (at least two sides of the same length) and exclusive (exactly two sides of the same length) definitions to be used. • Excludes precise measurement of angles.
DOK	1, 2, and/or 3 are eligible. DOK levels are designated on an item-by-item basis.
Context	Context Optional

Reporting Category	**GEOMETRY**
Content Standard	***5.G GEOMETRY*** **Classify two-dimensional figures into categories based on their properties.** ***5.G.4*** Identify and describe commonalities and differences between types of quadrilaterals based on angle measures, side lengths, and the presence or absence of parallel and perpendicular lines, e.g., squares, rectangles, parallelograms, trapezoids, and rhombuses.
Content Limits	• Limited to quadrilaterals. • Limited to Van Hiele Levels 0 (visualization) and 1 (analysis). • Trapezoids must allow both the inclusive (at least one pair of parallel sides) and exclusive (exactly one pair of parallel sides) definitions to be used. • Angle measures limited to visual recognition of equiangular, acute, right, or obtuse angles. • Excludes precise measurement of angles. • Excludes statements using the language of "all", "sometimes", or "never". • Excludes hierarchy of quadrilaterals (i.e., all squares are rhombuses but not all rhombuses are squares).
DOK	1, 2, and/or 3 are eligible. DOK levels are designated on an item-by-item basis.
Context	Context Optional