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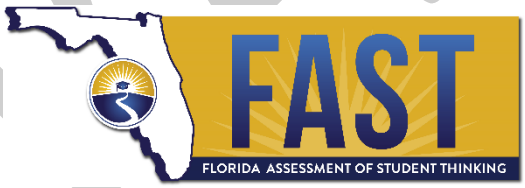
Grade 4 Mathematics Test Item Specifications



INTENDED FOR TEST ITEM WRITERS AND REVIEWERS FOR FLORIDA'S STATEWIDE ASSESSMENTS. NOT FOR INSTRUCTIONAL USE.

The contents of these draft *Test Item Specifications (Specifications)* are based on the benchmarks provided in Florida's Benchmarks for Excellent Student Thinking (B.E.S.T.) Standards. The *Specifications* define the content and format of the tests and test items and indicate the alignment of items with the benchmarks for test item writers and reviewers. **The *Specifications* are not intended for instructional use.**

With the adoption of Florida's B.E.S.T. Standards for ELA and Mathematics, the following comprehensive resource has been developed to support educators.

- Within the standards, **benchmark clarifications** provide helpful information for educators to understand and to implement each standard.

Given the availability of B.E.S.T. resources, and to prevent any misuse of the *Specifications* by educators, item specifications for ELA and Mathematics assessments aligned to the B.E.S.T. Standards will be reserved for their intended purpose of guiding item writers and reviewers. B.E.S.T. Standards implementation should be driven by the instructional support provided by the Just Read, Florida! Office (JRF) and the Bureau of Standards and Instructional Support (BSIS) to ensure that the focus remains on the content and skills students will engage with in the classroom.

Origin of the Specifications

The Florida Department of Education convened committees of Florida educators to help develop and approve the specifications documents.

Technology-Enhanced Item Descriptions

The Florida B.E.S.T. Standards Assessments are composed of test items that include traditional multiple-choice items as well as enhanced items that require students to select and/or support their answers.

The various enhanced item types are described below.

- **Technology-Enhanced Item Types—Mathematics**
  - **Editing Task Choice**—The student clicks a drop-down menu containing options to complete an equation or expression, a statement, or other component. The student then selects the correct response from the drop-down menu. For paper-based assessments, this item type is modified; the student fills in a bubble to indicate a selection.
  - **Selectable Hot Text**—The student is directed to click on one or more correct answers from among a number of options. When the student hovers over the options (e.g., phrases, sentences, numbers, or expressions), the text will highlight. This indicates that the text is selectable ("hot"). The options may be presented in various ways (e.g., as a list, embedded within text, or in a table). The student can then click on an option to select it. For paper-based assessments, this item type is modified; the student fills in a bubble to indicate a selection.
  - **Multiselect**—The student is directed to select all the correct answers from among a number of options. These items are different from Multiple Choice items, which allow the student to select only one correct answer. These items appear in the online and paper-based assessments.
  - **Graphic Response Item Display (GRID)**—The student uses the point, line, or arrow tools to create a response on a graph. The item type may also require the student to select numbers, words, phrases, or images and use the drag-and-drop feature to place them into a graphic. For paper-based assessments, this item type will be replaced with another item type.
  - **Equation Editor**—The student enters a number, variable, expression, or equation, as appropriate to the test item, in a response box. The student is presented with a toolbar that includes a variety of mathematical symbols that can be used to create a response. The response box may be separate from the text of the item, or it may be embedded within text of the item (e.g., in line with a sentence or within a table). For paper-based assessments, this item type is modified; the student writes a response in the response box.
  - **Matching Item**—The student checks a box to indicate whether information from a column header matches information from a row. The number of correct answer options per row or column may vary. These items appear in the online and paper-based assessments.

Any of the item types may be combined into a single item with multiple parts called a multi-interaction item. The student will interact with different item types within a single item. Each part could be a different item type. For paper-based assessments, different item types (multiple choice, multiselect, editing task choice, selectable hot text, matching, and equation editor) may be combined into a single item.

Item Specifications Definitions

- **Assessment Limits** define the range of content knowledge and degree of difficulty that should be assessed in the assessment items for the benchmark(s).
- **Meaning of Also Assesses**—Where mastery of overlapping mathematical skills of associated benchmark(s) could be assessed through primary benchmark(s).
- **Calculator Availability**
  The following chart displays the type of calculator that is available for each grade or course B.E.S.T. Assessment. Note: For grades 6, 7, 8, Algebra 1, and Geometry, calculators are available for the entire assessment.

Grade/Course	Calculator
3, 4, 5	None
6	Basic four-function
7, 8	Desmos scientific
Algebra 1, Geometry	Desmos scientific

  - **Calculator Designations**
    - **None**—Items for this benchmark **may not** allow for the availability of a calculator.
    - **Available**—Items for this benchmark **must** allow for the availability of a calculator.

- **Context Designations**
  Any item could include justifying and error analysis through reasoning.
  - **Real-world**—authentic application of mathematics to real-world situations
  - **Mathematical**—using models, equations, or evaluation of mathematical reasoning in the absence of a real-world context
  - **Both**—items could either use a real-world context or be strictly mathematical

Number Sense and Operations

MA.4.NSO.1	***Understand place value for multi-digit numbers.***
MA.4.NSO.1.1	Express how the value of a digit in a multi-digit whole number changes if the digit moves one place to the left or right.
Benchmark Clarifications	
Context	Mathematical
Calculator	None
Assessment Limits	Items will contain whole numbers within 1,000,000.

MA.4.NSO.1	***Understand place value for multi-digit numbers.***
MA.4.NSO.1.2	Read and write multi-digit whole numbers from 0 to 1,000,000 using standard form, expanded form and word form. *Example:* The number two hundred seventy-five thousand eight hundred two written in standard form is 275,802 and in expanded form is 200,000 + 70,000 + 5,000 + 800 + 2 or (2 × 100,000) + (7 × 10,000) + (5 × 1,000) + (8 × 100) + (2 × 1).
Benchmark Clarifications	
Context	Mathematical
Calculator	None
Assessment Limits	Given values are limited to whole numbers between 10,001 and 1,000,000.

MA.4.NSO.1	***Understand place value for multi-digit numbers.***
MA.4.NSO.1.3	Plot, order and compare multi-digit whole numbers up to 1,000,000. *Example:* The numbers 75,421; 74,241 and 74,521 can be arranged in ascending order as 74,241; 74,521 and 75,421.
Benchmark Clarifications	*Clarification 1:* When comparing numbers, instruction includes using an appropriately scaled number line and using place values of the hundred thousands, ten thousands, thousands, hundreds, tens and ones digits. *Clarification 2:* Scaled number lines must be provided and can be a representation of any range of numbers. *Clarification 3:* Within this benchmark, the expectation is to use symbols (<, > or =).
Context	Both
Calculator	None
Assessment Limits	Given values are limited to whole numbers between 10,001 and 1,000,000. Items using relational symbols are limited to two whole numbers. Items involving comparison may use relational words but must use relational symbols.

MA.4.NSO.1	***Understand place value for multi-digit numbers.***
MA.4.NSO.1.4	Round whole numbers from 0 to 10,000 to the nearest 10, 100 or 1,000. *Example:* The number 6,325 is rounded to 6,300 when rounded to the nearest 100. *Example:* The number 2,550 is rounded to 3,000 when rounded to the nearest 1,000.
Benchmark Clarifications	
Context	Both
Calculator	None
Assessment Limits	Given values are limited to whole numbers between 1,001 and 10,000.

MA.4.NSO.1	***Understand place value for multi-digit numbers.***
MA.4.NSO.1.5	Plot, order and compare decimals up to the hundredths. *Example:* The numbers 3.2; 3.24 and 3.12 can be arranged in ascending order as 3.12; 3.2 and 3.24.
Benchmark Clarifications	*Clarification 1:* When comparing numbers, instruction includes using an appropriately scaled number line and using place values of the ones, tenths and hundredths digits. *Clarification 2:* Within the benchmark, the expectation is to explain the reasoning for the comparison and use symbols (<, > or =). *Clarification 3:* Scaled number lines must be provided and can be a representation of any range of numbers.
Context	Mathematical
Calculator	None
Assessment Limits	Items using relational symbols are limited to two multi-digit numbers. Items involving comparison may use relational words but must use relational symbols.

MA.4.NSO.2	***Build an understanding of operations with multi-digit numbers including decimals.***
MA.4.NSO.2.3	Multiply two whole numbers, each up to two digits, including using a standard algorithm with procedural fluency.
Benchmark Clarifications	*Clarification 1:* Instruction focuses on helping a student choose a method they can use reliably.
Also Assesses	
MA.4.NSO.2.2	Multiply two whole numbers, up to three digits by up to two digits, with procedural reliability.
Benchmark Clarifications	*Clarification 1:* Instruction focuses on helping a student choose a method they can use reliably. *Clarification 2:* Instruction includes the use of models or equations based on place value and the distributive property.
Also Assesses	
MA.4.NSO.2.1	Recall multiplication facts with factors up to 12 and related division facts with automaticity.
Benchmark Clarifications	
Context	Mathematical
Calculator	None
Assessment Limits	Items assessing MA.4.NSO.2.2 must include at least one term having three digits.

MA.4.NSO.2	***Build an understanding of operations with multi-digit numbers including decimals.***
MA.4.NSO.2.4	Divide a whole number up to four digits by a one-digit whole number with procedural reliability. Represent remainders as fractional parts of the divisor.
Benchmark Clarifications	*Clarification 1:* Instruction focuses on helping a student choose a method they can use reliably. *Clarification 2:* Instruction includes the use of models based on place value, properties of operations or the relationship between multiplication and division.
Also Assesses	
MA.4.NSO.2.1	Recall multiplication facts with factors up to 12 and related division facts with automaticity.
Benchmark Clarifications	
Context	Mathematical
Calculator	None
Assessment Limits	Items may include whole number quotients.

MA.4.NSO.2	***Build an understanding of operations with multi-digit numbers including decimals.***
MA.4.NSO.2.5	Explore the multiplication and division of multi-digit whole numbers using estimation, rounding and place value. *Example:* The product of 215 and 460 can be estimated as being between 80,000 and 125,000 because it is bigger than 200 × 400 but smaller than 250 × 500. *Example:* The quotient of 1,380 and 27 can be estimated as 50 because 27 is close to 30 and 1,380 is close to 1,500. 1,500 divided by 30 is the same as 150 $tens$ divided by 3 $tens$ which is 5 $tens$, or 50.
Benchmark Clarifications	*Clarification 1:* Instruction focuses on previous understanding of multiplication with multiples of 10 and 100, and seeing division as a missing factor problem. *Clarification 2:* Estimating quotients builds the foundation for division using a standard algorithm. *Clarification 3*: When estimating the division of whole numbers, dividends are limited to up to four digits and divisors are limited to up to two digits.
Context	Both
Calculator	None
Assessment Limits	N/A

MA.4.NSO.2	***Build an understanding of operations with multi-digit numbers including decimals.***
MA.4.NSO.2.6	Identify the number that is one-tenth more, one-tenth less, one-hundredth more and one-hundredth less than a given number. *Example:* One-hundredth less than 1.10 is 1.09. *Example:* One-tenth more than 2.31 is 2.41.
Benchmark Clarifications	
Context	Mathematical
Calculator	None
Assessment Limits	N/A

Fractions

MA.4.FR.1	***Develop an understanding of the relationship between different fractions and the relationship between fractions and decimals.***
MA.4.FR.1.1	Model and express a fraction, including mixed numbers and fractions greater than one, with the denominator 10 as an equivalent fraction with the denominator 100.
Benchmark Clarifications	*Clarification 1:* Instruction emphasizes conceptual understanding through the use of manipulatives, visual models, number lines or equations.
Context	Mathematical
Calculator	None
Assessment Limits	Decimal notation will not be assessed at this benchmark. Items including models should not require a specific strategy.

MA.4.FR.1	***Develop an understanding of the relationship between different fractions and the relationship between fractions and decimals.***
MA.4.FR.1.2	Use decimal notation to represent fractions with denominators of 10 or 100, including mixed numbers and fractions greater than 1, and use fractional notation with denominators of 10 or 100 to represent decimals.
Benchmark Clarifications	*Clarification 1:* Instruction emphasizes conceptual understanding through the use of manipulatives visual models, number lines or equations. *Clarification 2:* Instruction includes the understanding that a decimal and fraction that are equivalent represent the same point on the number line and that fractions with denominators of 10 or powers of 10 may be called decimal fractions.
Context	Mathematical
Calculator	None
Assessment Limits	Items including models should not require a specific strategy.

MA.4.FR.1	***Develop an understanding of the relationship between different fractions and the relationship between fractions and decimals.***
MA.4.FR.1.3	Identify and generate equivalent fractions, including fractions greater than one. Describe how the numerator and denominator are affected when the equivalent fraction is created.
Benchmark Clarifications	*Clarification 1:* Instruction includes the use of manipulatives, visual models, number lines or equations. *Clarification 2:* Instruction includes recognizing how the numerator and denominator are affected when equivalent fractions are generated.
Context	Mathematical
Calculator	None
Assessment Limits	Items with denominators of 10 will not have a focus on equivalence with denominators of 100, since this is the expectation of MA.4.FR.1.1. Items will not include mixed numbers. Fractions given in items must have denominators limited to 2, 3, 4, 5, 6, 8, 10, 12, 16, and 100. Items with given number lines will include only whole number marks labeled on the number lines. Number lines in the answer options may include fractional marks labeled on the number line. Items including models should not require a specific strategy.

MA.4.FR.1	***Develop an understanding of the relationship between different fractions and the relationship between fractions and decimals.***
MA.4.FR.1.4	Plot, order and compare fractions, including mixed numbers and fractions greater than one, with different numerators and different denominators. *Example:* $1\frac{2}{3} > 1\frac{1}{4}$ because $\frac{2}{3}$ is greater than $\frac{1}{2}$ and $\frac{1}{2}$ is greater than $\frac{1}{4}$.
Benchmark Clarifications	*Clarification 1:* When comparing fractions, instruction includes using an appropriately scaled number line and using reasoning about their size. *Clarification 2:* Within this benchmark, the expectation is to be able to use benchmark quantities, such as 0, $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$ and 1, to compare fractions. Clarification 3: Denominators are limited to 2, 3, 4, 5, 6, 8, 10, 12, 16 and 100. *Clarification 4:* Within this benchmark, the expectation is to use symbols (<, > or =).
Context	Mathematical
Calculator	None
Assessment Limits	Items with given number lines will include only whole number marks labeled on the number lines. Number lines in the answer options may include fractional marks labeled on the number line. Items involving comparison may use relational words but must use relational symbols.

MA.4.FR.2	***Build a foundation of addition, subtraction and multiplication operations with fractions.***
MA.4.FR.2.1	Decompose a fraction, including mixed numbers and fractions greater than one, into a sum of fractions with the same denominator in multiple ways. Demonstrate each decomposition with objects, drawings and equations. *Example:* $\frac{9}{8}$ can be decomposed as $\frac{8}{8} + \frac{1}{8}$ or as $\frac{3}{8} + \frac{3}{8} + \frac{3}{8}$.
Benchmark Clarifications	*Clarification 1:* Denominators are limited to 2, 3, 4, 5, 6, 8, 10, 12, 16 and 100.
Context	Mathematical
Calculator	None
Assessment Limits	The addition expression must include at least one non-unit fraction.

MA.4.FR.2	***Build a foundation of addition, subtraction and multiplication operations with fractions.***
MA.4.FR.2.2	Add and subtract fractions with like denominators, including mixed numbers and fractions greater than one, with procedural reliability. *Example:* The difference $\frac{9}{5} - \frac{4}{5}$ can be expressed as 9 $fifths$ minus 4 $fifths$ which is 5 $fifths$, or one.
Benchmark Clarifications	*Clarification 1:* Instruction includes the use of word form, manipulatives, drawings, the properties of operations or number lines. *Clarification 2:* Within this benchmark, the expectation is not to simplify or use lowest terms. *Clarification 3:* Denominators are limited to 2, 3, 4, 5, 6, 8, 10, 12, 16 and 100.
Context	Mathematical
Calculator	None
Assessment Limits	N/A

MA.4.FR.2	***Build a foundation of addition, subtraction and multiplication operations with fractions.***
MA.4.FR.2.3	Explore the addition of a fraction with denominator of 10 to a fraction with denominator of 100 using equivalent fractions. *Example:* $\frac{9}{100} + \frac{3}{10}$ is equivalent to $\frac{9}{100} + \frac{30}{100}$ which is equivalent to $\frac{39}{100}$.
Benchmark Clarifications	*Clarification 1:* Instruction includes the use of visual models. *Clarification 2:* Within this benchmark, the expectation is not to simplify or use lowest terms.
Context	Mathematical
Calculator	None
Assessment Limits	Items may include fractions greater than one but may not use mixed numbers.

Algebraic Reasoning

MA.4.AR.1	***Represent and solve problems involving the four operations with whole numbers and fractions.***
MA.4.AR.1.1	Solve real-world problems involving multiplication and division of whole numbers including problems in which remainders must be interpreted within the context. *Example:* A group of 243 students is taking a field trip and traveling in vans. If each van can hold 8 students, then the group would need 31 vans for their field trip because 243 divided by 8 equals 30 with a remainder of 3.
Benchmark Clarifications	*Clarification 1:* Problems involving multiplication include multiplicative comparisons. Refer to Situations Involving Operations with Numbers (Appendix A). *Clarification 2:* Depending on the context, the solution of a division problem with a remainder may be the whole number part of the quotient, the whole number part of the quotient with the remainder, the whole number part of the quotient plus 1, or the remainder. *Clarification 3:* Multiplication is limited to products of up to 3 digits by 2 digits. Division is limited to up to 4 digits divided by 1 digit.
Context	Real-world
Calculator	None
Assessment Limits	Multiplication must include factors greater than 12 and related division facts. Items are limited to one procedural step.

MA.4.AR.1	***Represent and solve problems involving the four operations with whole numbers and fractions.***
MA.4.AR.1.2	Solve real-world problems involving addition and subtraction of fractions with like denominators, including mixed numbers and fractions greater than one. *Example:* Megan is making pies and uses the equation $1\frac{3}{4} + 3\frac{1}{4} = x$ when baking. Describe a situation that can represent this equation. *Example:* Clay is running a 10K race. So far, he has run $6\frac{1}{5}$ kilometers. How many kilometers does he have remaining?
Benchmark Clarifications	*Clarification 1:* Problems include creating real-world situations based on an equation or representing a real-world problem with a visual model or equation. *Clarification 2:* Fractions within problems must reference the same whole. *Clarification 3:* Within this benchmark, the expectation is not to simplify or use lowest terms. *Clarification 4:* Denominators limited to 2, 3, 4, 5, 6, 8, 10, 12, 16 and 100.
Context	Real-world
Calculator	None
Assessment Limits	N/A

MA.4.AR.1	***Represent and solve problems involving the four operations with whole numbers and fractions.***
MA.4.AR.1.3	Solve real-world problems involving multiplication of a fraction by a whole number or a whole number by a fraction. *Example:* Ken is filling his garden containers with a cup that holds $\frac{2}{5}$ pounds of soil. If he uses 8 cups to fill his garden containers, how many pounds of soil did Ken use?
Benchmark Clarifications	*Clarification 1:* Problems include creating real-world situations based on an equation or representing a real-world problem with a visual model or equation. *Clarification 2:* Fractions within problems must reference the same whole. *Clarification 3:* Within this benchmark, the expectation is not to simplify or use lowest terms. *Clarification 4:* Fractions limited to fractions less than one with denominators of 2, 3, 4, 5, 6, 8, 10, 12, 16 and 100.
Also Assesses	
MA.4.FR.2.4	Extend previous understanding of multiplication to explore the multiplication of a fraction by a whole number or a whole number by a fraction. *Example:* Shanice thinks about finding the product $\frac{1}{4} \times 8$ by imagining having 8 pizzas that she wants to split equally with three of her friends. She and each of her friends will get 2 pizzas since $\frac{1}{4} \times 8 = 2$. *Example:* Lacey thinks about finding the product $8 \times \frac{1}{4}$ by imagining having 8 pizza boxes each with one-quarter slice of a pizza left. If she put them all together, she would have a total of 2 whole pizzas since $8 \times \frac{1}{4} = \frac{8}{4}$ which is equivalent to 2.
Benchmark Clarifications	*Clarification 1:* Instruction includes the use of visual models or number lines and the connection to the commutative property of multiplication. Refer to Properties of Operation, Equality and Inequality (Appendix D). *Clarification 2:* Within this benchmark, the expectation is not to simplify or use lowest terms. *Clarification 3:* Fractions multiplied by a whole number are limited to less than 1. All denominators are limited to 2, 3, 4, 5, 6, 8, 10, 12, 16, and 100.
Context	Real-world for MA.4.AR.1.3 Both for MA.4.FR.2.4
Calculator	None
Assessment Limits	Real-world items aligned to MA.4.FR.2.4 will not require solving. Real-world items aligned to MA.4.AR.1.3 must involve solving.

MA.4.AR.2	***Demonstrate an understanding of equality and operations with whole numbers.***
MA.4.AR.2.1	Determine and explain whether an equation involving any of the four operations with whole numbers is true or false. *Example:* The equation 32 ÷ 8 = 32 − 8 − 8 − 8 − 8 can be determined to be false because the expression on the left side of the equal sign is not equivalent to the expression on the right side of the equal sign.
Benchmark Clarifications	*Clarification 1:* Multiplication is limited to whole number factors within 12 and related division facts.
Context	Mathematical
Calculator	None
Assessment Limits	Items must include at least two procedural steps on one side of the equation and at least one step on the other side of the equation. Items must use only one arithmetic operation on each side of the equation.

MA.4.AR.2	***Demonstrate an understanding of equality and operations with whole numbers.***
MA.4.AR.2.2	Given a mathematical or real-world context, write an equation involving multiplication or division to determine the unknown whole number with the unknown in any position. *Example:* The equation 96 = 8 × t can be used to determine the cost of each movie ticket at the movie theatre if a total of $96 was spent on 8 equally priced tickets. Then each ticket costs $12.
Benchmark Clarifications	*Clarification 1:* Instruction extends the development of algebraic thinking skills where the symbolic representation of the unknown uses a letter. *Clarification 2:* Problems include the unknown on either side of the equal sign. *Clarification 3:* Multiplication is limited to factors within 12 and related division facts.
Context	Both
Calculator	None
Assessment Limits	Equations in items must be solved in one procedural step.

MA.4.AR.3	***Recognize numerical patterns, including patterns that follow a given rule.***
MA.4.AR.3.1	Determine factor pairs for a whole number from 0 to 144. Determine whether a whole number from 0 to 144 is prime, composite or neither.
Benchmark Clarifications	*Clarification 1:* Instruction includes the connection to the relationship between multiplication and division and patterns with divisibility rules. *Clarification 2:* The numbers 0 and 1 are neither prime nor composite.
Context	Mathematical
Calculator	None
Assessment Limits	N/A

MA.4.AR.3	***Recognize numerical patterns, including patterns that follow a given rule.***
MA.4.AR.3.2	Generate, describe and extend a numerical pattern that follows a given rule. *Example:* Generate a pattern of four numbers that follows the rule of adding 14 starting at 5.
Benchmark Clarifications	*Clarification 1:* Instruction includes patterns within a mathematical or real-world context.
Context	Both
Calculator	None
Assessment Limits	Items must provide the rule. Rules are limited to one procedural step that includes any of the four mathematical operations. Items are limited to whole numbers.

Measurement

MA.4.M.1	***Measure the length of objects and solve problems involving measurement.***
MA.4.M.1.1	Select and use appropriate tools to measure attributes of objects.
Benchmark Clarifications	*Clarification 1:* Attributes include length, volume, weight, mass and temperature. *Clarification 2:* Instruction includes digital measurements and scales that are not linear in appearance. *Clarification 3:* When recording measurements, use fractions and decimals where appropriate.
Context	Mathematical
Calculator	None
Assessment Limits	Allowable units of measurement include meter, centimeter, millimeter, liter, milliliter, kilogram, gram, milligram, yard, foot, inch, gallon, quart, pint, cup, ton, pound, ounce, Celsius, and Fahrenheit. Items will not measure lengths or volume to a whole number centimeter, inch, liter, milliliter, or cup; or to a half or quarter inch or cup. Items will not require temperature to be measured to whole degrees. Fractional representation is limited to the appropriateness of the tool. Decimals are limited to the hundredths.

MA.4.M.1	**Measure the length of objects and solve problems involving measurement.**
MA.4.M.1.2	Convert within a single system of measurement using the units: yards, feet, inches; kilometers, meters, centimeters, millimeters; pounds, ounces; kilograms, grams; gallons, quarts, pints, cups; liter, milliliter; and hours, minutes, seconds. Example: If a ribbon is 11 yards 2 feet in length, how long is the ribbon in feet? Example: A gallon contains 16 cups. How many cups are in $3\frac{1}{2}$ gallons?
Benchmark Clarifications	*Clarification 1:* Instruction includes the understanding of how to convert from smaller to larger units or from larger to smaller units. *Clarification 2*: Within the benchmark, the expectation is not to convert from grams to kilograms, meters to kilometers or milliliters to liters. *Clarification 3*: Problems involving fractions are limited to denominators of 2, 3, 4, 5, 6, 8, 10, 12, 16 and 100.
Context	Both
Calculator	None
Assessment Limits	Items will only include one conversion and will be limited to a maximum of two procedural steps.

MA.4.M.2	***Solve problems involving time and money.***
MA.4.M.2.1	Solve two-step real-world problems involving distances and intervals of time using any combination of the four operations.
Benchmark Clarifications	*Clarification 1:* Problems involving fractions will include addition and subtraction with like denominators and multiplication of a fraction by a whole number or a whole number by a fraction. *Clarification 2:* Problems involving fractions are limited to denominators of 2, 3, 4, 5, 6, 8, 10, 12, 16 and 100. *Clarification 3:* Within the benchmark, the expectation is not to use decimals.
Context	Real-world
Calculator	None
Assessment Limits	Items not including a fraction and including intervals of time will only cross from a.m. to p.m. and p.m. to a.m. Responses greater than 60 minutes can be expressed as total minutes or in hours and minutes.

MA.4.M.2	***Solve problems involving time and money.***
MA.4.M.2.2	Solve one- and two-step addition and subtraction real-world problems involving money using decimal notation. *Example:* An item costs $1.84. If you give the cashier $2.00, how much change should you receive? What coins could be used to give the change? *Example:* At the grocery store you spend $14.56. If you do not want any pennies in change, how much money could you give the cashier?
Benchmark Clarifications	
Also Assesses	
MA.4.NSO.2.7	Explore the addition and subtraction of multi-digit numbers with decimals to the hundredths.
Benchmark Clarifications	*Clarification 1*: Instruction includes the connection to money and the use of manipulatives and models based on place value.
Context	Real-world for MA.4.M.2.2 Mathematical for MA.4.NSO.2.7
Calculator	None
Assessment Limits	Items assessing MA.4.M.2.2 are limited to values that are less than or equal to $100.

Geometric Reasoning

MA.4.GR.1	***Draw, classify and measure angles.***
MA.4.GR.1.1	Informally explore angles as an attribute of two-dimensional figures. Identify and classify angles as acute, right, obtuse, straight or reflex.
Benchmark Clarifications	*Clarification 1:* Instruction includes classifying angles using benchmark angles of 90° and 180° in two- dimensional figures. *Clarification 2:* When identifying angles, the expectation includes two-dimensional figures and real-world pictures.
Context	Mathematical
Calculator	None
Assessment Limits	Whole number degree measures may be within 0° and 360°. Items with two-dimensional figures will not include hatch marks representing sides of equal lengths, arcs representing angles of equal measure, or arrows indicating parallel lines/sides.

MA.4.GR.1	***Draw, classify and measure angles.***
MA.4.GR.1.2	Estimate angle measures. Using a protractor, measure angles in whole-number degrees and draw angles of specified measure in whole-number degrees. Demonstrate that angle measure is additive.
Benchmark Clarifications	*Clarification 1:* Instruction includes measuring given angles and drawing angles using protractors. *Clarification 2:* Instruction includes estimating angle measures using benchmark angles (30°, 45°, 60°, 90° and 180°). *Clarification 3:* Instruction focuses on the understanding that angles can be decomposed into non- overlapping angles whose measures sum to the measure of the original angle.
Context	Mathematical
Calculator	None
Assessment Limits	Items will contain graphics. Whole number degree measures, sums, and differences will only be within 0° and 360°. Items estimating angle measures must use benchmark angles (30°, 45°, 60°, 90°, 180°). Items will not have angles decomposed into more than three angles.

MA.4.GR.1	***Draw, classify and measure angles.***
MA.4.GR.1.3	Solve real-world and mathematical problems involving unknown whole-number angle measures. Write an equation to represent the unknown.
Benchmark Clarifications	*Example:* A 60° angle is decomposed into two angles, one of which is 25°. What is the measure of the other angle?
Context	Both
Calculator	None
Assessment Limits	Whole number degree measures, sums, and differences will only be within 0° and 360°. Items will use variables for unknown angle measures. Items will not have angles decomposed into more than three angles.

MA.4.GR.2	***Solve problems involving the perimeter and area of rectangles.***
MA.4.GR.2.1	Solve perimeter and area mathematical and real-world problems, including problems with unknown sides, for rectangles with whole-number side lengths.
Benchmark Clarifications	*Clarification 1:* Instruction extends the development of algebraic thinking where the symbolic representation of the unknown uses a letter. *Clarification 2:* Problems involving multiplication are limited to products of up to 3 digits by 2 digits. Problems involving division are limited to up to 4 digits divided by 1 digit. *Clarification 3:* Responses must include the appropriate units in word form.
Context	Both
Calculator	None
Assessment Limits	Items involving finding the area for two-dimensional figures must include side dimensions that are greater than 12 units. Items may require the students to find the perimeter, the area, or both.

MA.4.GR.2	***Solve problems involving the perimeter and area of rectangles.***
MA.4.GR.2.2	Solve problems involving rectangles with the same perimeter and different areas or with the same area and different perimeters. *Example:* Possible dimensions of a rectangle with an area of 24 square feet include 6 feet by 4 feet or 8 feet by 3 feet. This can be found by cutting a rectangle into unit squares and rearranging them.
Benchmark Clarifications	*Clarification 1:* Instruction focuses on the conceptual understanding of the relationship between perimeter and area. *Clarification 2:* Within this benchmark, rectangles are limited to having whole-number side lengths. *Clarification 3:* Problems involving multiplication are limited to products of up to 3 digits by 2 digits. Problems involving division are limited to up to 4 digits divided by 1 digit. *Clarification 4:* Responses must include the appropriate units in word form.
Context	Both
Calculator	None
Assessment Limits	N/A

Data Analysis and Probability

MA.4.DP.1	***Collect, represent and interpret data and find the mode, median and range of a data set.***
MA.4.DP.1.1	Collect and represent numerical data, including fractional values, using tables, stem-and-leaf plots or line plots. *Example:* A softball team is measuring their hat size. Each player measures the distance around their head to the nearest half inch. The data is collected and represented on a line plot.
Benchmark Clarifications	*Clarification 1:* Denominators are limited to 2, 3, 4, 5, 6, 8, 10, 12, 16 and 100.
Context	Both
Calculator	None
Assessment Limits	Items that contain fractions greater than one may be represented as mixed numbers. Items with numerical data represented on tables or line plots must include at least one fraction. Numerical data sets will not be presented using braces.

MA.4.DP.1	***Collect, represent and interpret data and find the mode, median and range of a data set.***
MA.4.DP.1.2	Determine the mode, median or range to interpret numerical data including fractional values, represented with tables, stem-and-leaf plots or line plots. *Example:* Given the data of the softball team's hat size represented on a line plot, determine the most common size and the difference between the largest and the smallest sizes.
Benchmark Clarifications	*Clarification 1:* Instruction includes interpreting data within a real-world context. *Clarification 2:* Instruction includes recognizing that data sets can have one mode, no mode or more than one mode. *Clarification 3:* Within this benchmark, data sets are limited to an odd number when calculating the median. *Clarification 4:* Denominators are limited to 2, 3, 4, 5, 6, 8, 10, 12, 16 and 100.
Context	Both
Calculator	None
Assessment Limits	Items that contain fractions greater than one may be represented as mixed numbers.

MA.4.DP.1	***Collect, represent and interpret data and find the mode, median and range of a data set.***
MA.4.DP.1.3	Solve real-world problems involving numerical data. *Example:* Given the data of the softball team's hat size represented on a line plot, determine the fraction of the team that has a head size smaller than 20 inches.
Benchmark Clarifications	*Clarification 1:* Instruction includes using any of the four operations to solve problems. *Clarification 2:* Data involving fractions with like denominators are limited to 2, 3, 4, 5, 6, 8, 10, 12, 16 and 100. Fractions can be greater than one. *Clarification 3:* Data involving decimals are limited to hundredths.
Context	Real-world
Calculator	None
Assessment Limits	Items that contain fractions greater than one may be represented as mixed numbers. Numerical data sets will not be presented using braces.

Appendix A

Grade 4 FAST Mathematics Reference Sheet

Customary Conversions

1 foot = 12 inches
1 yard = 3 feet

1 pint = 2 cups
1 quart = 2 pints
1 gallon = 4 quarts

1 pound = 16 ounces

Metric Conversions

1 meter = 100 centimeters
1 meter = 1000 millimeters
1 kilometer = 1000 meters

1 liter = 1000 milliliters

1 gram = 1000 milligrams
1 kilogram = 1000 grams

Time Conversions

1 minute = 60 seconds
1 hour = 60 minutes

Formulas

Rectangle $P = l + l + w + w$
$A = l \times w$

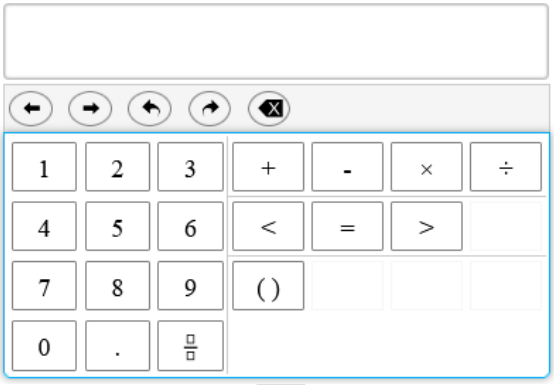
Key	
l = length w = width	P = perimeter A = area

Appendix B

Keypads for Grade 4 Computer-Based Tests

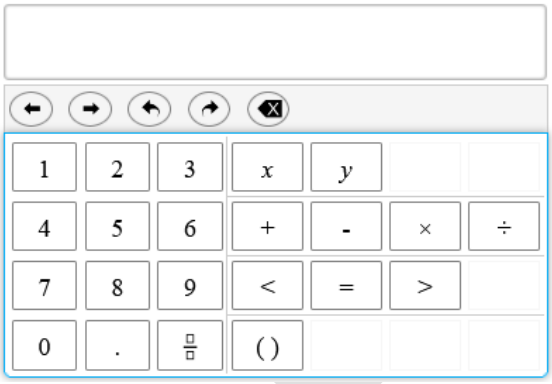
Numeric Only

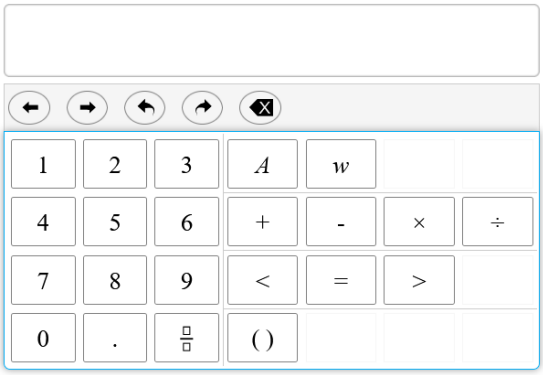
Full Keypad



Full Keypad with Variables:

Variables may change but the rest of the keys are always the same as the full keypad above.





Appendix C: Change Log

Page(s)	Change	Date
5	Updated calculator information	November 2022
1	Added “AND REVIEWERS” after “ITEM WRITERS”	June 2023
3	Removed “of” after “select all” in the multi-select section.	June 2023
29	Added “the” after “same as” in Full Keypad With Variables section. Added period to end of statement.	June 2023
3-4	Updated language to remove “scanned and scored electronically.”	August 2023