

Tutorials are designed specifically for the Virginia Standards of Learning to prepare students for the Standards of Learning tests.

Math Tutorials offer targeted instruction, practice and review designed to develop computational fluency, deepen conceptual understanding, and apply mathematical practices. They automatically identify and address learning gaps down to elementary-level content, using adaptive remediation to bring students to grade-level no matter where they start. Students engage with the content in an interactive, feedback-rich environment as they progress through standards-aligned modules. By constantly honing the ability to apply their knowledge in abstract and real world scenarios, students build the depth of knowledge and higher order skills required to demonstrate their mastery when put to the test.

In each module, the Learn It and Try It make complex ideas accessible to students through focused content, modeled logic and process, multi-modal representations, and personalized feedback as students reason through increasingly challenging problems. The Review It offers a high impact summary of key concepts and relates those concepts to students' lives. The Test It assesses students' mastery of the module's concepts, providing granular performance data to students and teachers after each attempt. To help students focus on the content most relevant to them, unit-level pretests and posttests can quickly identify where students are strong and where they're still learning.

### Unit 1: Rates and Proportions

- **UNIT RATES**
  - CE.7.3: Computation and Estimation The student will solve single-step and multistep practical problems, using proportional reasoning.
- **IDENTIFYING PROPORTIONAL RELATIONSHIPS**
  - CE.7.3: Computation and Estimation The student will solve single-step and multistep practical problems, using proportional reasoning.
- **ANALYZING PROPORTIONAL RELATIONSHIPS**
  - CE.7.3: Computation and Estimation The student will solve single-step and multistep practical problems, using proportional reasoning.

### Unit 2: Proportional Relationships

- **REPRESENTING PROPORTIONAL RELATIONSHIPS**
  - CE.7.3: Computation and Estimation The student will solve single-step and multistep practical problems, using proportional reasoning.
  - PFA.7.10.a: Patterns, Functions, and Algebra The student will determine the slope,  $m$ , as rate of change in a proportional relationship between two quantities and write an equation in the form  $y =$

$mx$  to represent the relationship;

- **USING PROPORTIONS TO SOLVE PROBLEMS**

- CE.7.3: Computation and Estimation The student will solve single-step and multistep practical problems, using proportional reasoning.

- **MULTIPLE REPRESENTATIONS OF PROPORTIONS**

- CE.7.3: Computation and Estimation The student will solve single-step and multistep practical problems, using proportional reasoning.
- PFA.7.10.a: Patterns, Functions, and Algebra The student will determine the slope,  $m$ , as rate of change in a proportional relationship between two quantities and write an equation in the form  $y = mx$  to represent the relationship;

### Unit 3: Number Sense

- **APPROXIMATING IRRATIONAL NUMBERS**

- NS.7.1.d: Number and Number Sense The student will determine square roots of perfect squares; and
- NS.7.1.c: Number and Number Sense The student will compare and order rational numbers;

- **ABSOLUTE VALUE**

- NS.7.1.e: Number and Number Sense The student will identify and describe absolute value of rational numbers.

- **POWERS OF 10**

- NS.7.1.b: Number and Number Sense The student will compare and order numbers greater than zero written in scientific notation;
- NS.7.1.a: Number and Number Sense The student will investigate and describe the concept of negative exponents for powers of ten;
- NS.7.1.c: Number and Number Sense The student will compare and order rational numbers;

### Unit 4: Addition and Subtraction of Rational Numbers

- **ADDING RATIONAL NUMBERS**

- NS.7.1.e: Number and Number Sense The student will identify and describe absolute value of rational numbers.
- CE.7.2: Computation and Estimation The student will solve practical problems involving operations with rational numbers.

- **SUBTRACTING RATIONAL NUMBERS**

- NS.7.1.e: Number and Number Sense The student will identify and describe absolute value of rational numbers.
- CE.7.2: Computation and Estimation The student will solve practical problems involving operations with rational numbers.

- **USING PROPERTIES TO ADD AND SUBTRACT RATIONAL NUMBERS**

- CE.7.2: Computation and Estimation The student will solve practical problems involving operations with rational numbers.

### Unit 5: Multiplication and Division of Rational Numbers

- **MULTIPLYING RATIONAL NUMBERS**

- CE.7.2: Computation and Estimation The student will solve practical problems involving operations with rational numbers.

- **DIVIDING RATIONAL NUMBERS**

- CE.7.2: Computation and Estimation The student will solve practical problems involving operations with rational numbers.

### Unit 6: Solving Problems with Rational Numbers

- **USING PROPERTIES TO MULTIPLY AND DIVIDE RATIONAL NUMBERS**

- CE.7.2: Computation and Estimation The student will solve practical problems involving operations with rational numbers.

- **USING OPERATIONS ON RATIONAL NUMBERS TO SOLVE PROBLEMS**

- CE.7.2: Computation and Estimation The student will solve practical problems involving operations with rational numbers.

### Unit 7: Algebraic Expressions, Equations, and Inequalities

- **EVALUATING EXPRESSIONS**

- PFA.7.11: Patterns, Functions, and Algebra The student will evaluate algebraic expressions for given replacement values of the variables.

- **SOLVING TWO-STEP EQUATIONS**

- PFA.7.12: Patterns, Functions, and Algebra The student will solve two-step linear equations in one variable, including practical problems that require the solution of a two-step linear equation in one variable.

- **SOLVING LINEAR INEQUALITIES**

- PFA.7.13: Patterns, Functions, and Algebra The student will solve one- and two-step linear inequalities in one variable, including practical problems, involving addition, subtraction, multiplication, and division, and graph the solution on a number line.

### Unit 8: Linear Equations

- **SLOPE**

- PFA.7.10.a: Patterns, Functions, and Algebra The student will determine the slope,  $m$ , as rate of change in a proportional relationship between two quantities and write an equation in the form  $y = mx$  to represent the relationship;
- PFA.7.10.c: Patterns, Functions, and Algebra The student will determine the  $y$ -intercept,  $b$ , in an additive relationship between two quantities and write an equation in the form  $y = x + b$  to represent the relationship;

- PFA.7.10.b: Patterns, Functions, and Algebra The student will graph a line representing a proportional relationship between two quantities given the slope and an ordered pair, or given the equation in  $y = mx$  form where  $m$  represents the slope as rate of change;
- **SLOPE-INTERCEPT FORM**
  - PFA.7.10.d: Patterns, Functions, and Algebra The student will graph a line representing an additive relationship between two quantities given the  $y$ -intercept and an ordered pair, or given the equation in the form  $y = x + b$ , where  $b$  represents the  $y$ -intercept; and
  - PFA.7.10.b: Patterns, Functions, and Algebra The student will graph a line representing a proportional relationship between two quantities given the slope and an ordered pair, or given the equation in  $y = mx$  form where  $m$  represents the slope as rate of change;
  - PFA.7.10.c: Patterns, Functions, and Algebra The student will determine the  $y$ -intercept,  $b$ , in an additive relationship between two quantities and write an equation in the form  $y = x + b$  to represent the relationship;
  - PFA.7.10.e: Patterns, Functions, and Algebra The student will make connections between and among representations of a proportional or additive relationship between two quantities using verbal descriptions, tables, equations, and graphs.

## Unit 9: Linear Functions

- **INDEPENDENT AND DEPENDENT VARIABLES**
  - PFA.7.10.c: Patterns, Functions, and Algebra The student will determine the  $y$ -intercept,  $b$ , in an additive relationship between two quantities and write an equation in the form  $y = x + b$  to represent the relationship;
  - PFA.7.10.e: Patterns, Functions, and Algebra The student will make connections between and among representations of a proportional or additive relationship between two quantities using verbal descriptions, tables, equations, and graphs.
  - PFA.7.10.d: Patterns, Functions, and Algebra The student will graph a line representing an additive relationship between two quantities given the  $y$ -intercept and an ordered pair, or given the equation in the form  $y = x + b$ , where  $b$  represents the  $y$ -intercept; and
- **WRITING LINEAR FUNCTIONS**
  - PFA.7.10.c: Patterns, Functions, and Algebra The student will determine the  $y$ -intercept,  $b$ , in an additive relationship between two quantities and write an equation in the form  $y = x + b$  to represent the relationship;
  - PFA.7.10.e: Patterns, Functions, and Algebra The student will make connections between and among representations of a proportional or additive relationship between two quantities using verbal descriptions, tables, equations, and graphs.

## Unit 10: Quadrilaterals

- **PARALLELOGRAMS AND RECTANGLES**
  - MG.7.6.a: Measurement and Geometry The student will compare and contrast quadrilaterals based on their properties; and

- MG.7.6.b: Measurement and Geometry The student will determine unknown side lengths or angle measures of quadrilaterals.
- **SQUARES AND RHOMBI**
- MG.7.6.a: Measurement and Geometry The student will compare and contrast quadrilaterals based on their properties; and
- MG.7.6.b: Measurement and Geometry The student will determine unknown side lengths or angle measures of quadrilaterals.

### Unit 11: Geometry in Two and Three Dimensions

- **AREA, VOLUME, AND SURFACE AREA**

- MG.7.4.a: Measurement and Geometry The student will describe and determine the volume and surface area of rectangular prisms and cylinders; and
- MG.7.4.b: Measurement and Geometry The student will solve problems, including practical problems, involving the volume and surface area of rectangular prisms and cylinders.

- **VOLUME OF CYLINDERS AND CONES**

- MG.7.4.a: Measurement and Geometry The student will describe and determine the volume and surface area of rectangular prisms and cylinders; and
- MG.7.4.b: Measurement and Geometry The student will solve problems, including practical problems, involving the volume and surface area of rectangular prisms and cylinders.

### Unit 12: Transformations

- **BASICS OF TRANSFORMATIONS**

- MG.7.7: Measurement and Geometry The student will apply translations and reflections of right triangles or rectangles in the coordinate plane.

- **TRANSFORMATIONS ON THE COORDINATE PLANE**

- MG.7.7: Measurement and Geometry The student will apply translations and reflections of right triangles or rectangles in the coordinate plane.

- **SIMILARITY AND DILATIONS**

- MG.7.5: Measurement and Geometry The student will solve problems, including practical problems, involving the relationship between corresponding sides and corresponding angles of similar quadrilaterals and triangles.

### Unit 13: Probability and Statistics

- **CALCULATING PROBABILITY**

- PS.7.8.a: Probability and Statistics The student will determine the theoretical and experimental probabilities of an event; and
- PS.7.8.b: Probability and Statistics The student will investigate and describe the difference between the experimental probability and theoretical probability of an event.

- **DOT PLOTS AND HISTOGRAMS**

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- PS.7.9.a: Probability and Statistics The student, given data in a practical situation, will represent data in a histogram;
  - PS.7.9.b: Probability and Statistics The student, given data in a practical situation, will make observations and inferences about data represented in a histogram; and
  - PS.7.9.c: Probability and Statistics The student, given data in a practical situation, will compare histograms with the same data represented in stem-and-leaf plots, line plots, and circle graphs.