

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.

## 1. RATES AND PROPORTIONS

- **UNIT RATES**

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

- **IDENTIFYING PROPORTIONAL RELATIONSHIPS**

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

- **ANALYZING PROPORTIONAL RELATIONSHIPS**

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

## 2. PROPORTIONAL RELATIONSHIPS

- **REPRESENTING PROPORTIONAL RELATIONSHIPS**

- **CE.7.3** *The student will solve single-step and multistep practical problems, using proportional reasoning.*
- **PFA.7.10.a** *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** *The student will solve single-step and multistep practical problems, using proportional reasoning.*

- **MULTIPLE REPRESENTATIONS OF PROPORTIONS**

- **CE.7.3** *The student will solve single-step and multistep practical problems, using proportional reasoning.*
- **PFA.7.10.a** *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;*

## 3. NUMBER SENSE

- **APPROXIMATING IRRATIONAL NUMBERS**

- **NS.7.1.d** determine square roots of perfect squares; and
- **NS.7.1.c** compare and order rational numbers;

- **ABSOLUTE VALUE**

- **NS.7.1.e** identify and describe absolute value of rational numbers.

- **POWERS OF 10**

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

## 4. ADDITION AND SUBTRACTION OF RATIONAL NUMBERS

- **ADDING RATIONAL NUMBERS**

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

- **SUBTRACTING RATIONAL NUMBERS**

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

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

- **CE.7.2** The student will solve practical problems involving operations with rational numbers.

## 5. MULTIPLICATION AND DIVISION OF RATIONAL NUMBERS

- **MULTIPLYING RATIONAL NUMBERS**

- **CE.7.2** The student will solve practical problems involving operations with rational numbers.

- **DIVIDING RATIONAL NUMBERS**

- **CE.7.2** The student will solve practical problems involving operations with rational numbers.

## 6. SOLVING PROBLEMS WITH RATIONAL NUMBERS

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

- **CE.7.2** The student will solve practical problems involving operations with rational numbers.

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

- **CE.7.2** The student will solve practical problems involving operations with rational numbers.

## 7. ALGEBRAIC EXPRESSIONS, EQUATIONS, AND INEQUALITIES

- **EVALUATING EXPRESSIONS**

- **PFA.7.11** The student will evaluate algebraic expressions for given replacement values of the variables.

- **SOLVING TWO-STEP EQUATIONS**

- **PFA.7.12** 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** *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.*

## 8. LINEAR EQUATIONS

- **SLOPE**

- **PFA.7.10.a** *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** *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** *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** *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** *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** *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** *make connections between and among representations of a proportional or additive relationship between two quantities using verbal descriptions, tables, equations, and graphs.*

## 9. LINEAR FUNCTIONS

- **INDEPENDENT AND DEPENDENT VARIABLES**

- **PFA.7.10.c** *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** *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** *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** *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** *make connections between and among representations of a proportional or additive relationship between two quantities using verbal descriptions, tables, equations, and graphs.*

## 10. QUADRILATERALS

- **PARALLELOGRAMS AND RECTANGLES**

- **MG.7.6.a** *compare and contrast quadrilaterals based on their properties; and*
- **MG.7.6.b** *determine unknown side lengths or angle measures of quadrilaterals.*

- **SQUARES AND RHOMBI**

- **MG.7.6.a** *compare and contrast quadrilaterals based on their properties; and*
- **MG.7.6.b** *determine unknown side lengths or angle measures of quadrilaterals.*

## 11. GEOMETRY IN TWO AND THREE DIMENSIONS

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

- **MG.7.4.a** describe and determine the volume and surface area of rectangular prisms and cylinders; and
- **MG.7.4.b** 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** describe and determine the volume and surface area of rectangular prisms and cylinders; and
- **MG.7.4.b** solve problems, including practical problems, involving the volume and surface area of rectangular prisms and cylinders.

## 12. TRANSFORMATIONS

- **BASICS OF TRANSFORMATIONS**

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

- **TRANSFORMATIONS ON THE COORDINATE PLANE**

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

- **SIMILARITY AND DILATIONS**

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

## 13. PROBABILITY AND STATISTICS

- **CALCULATING PROBABILITY**

- **PS.7.8.a** determine the theoretical and experimental probabilities of an event; and
- **PS.7.8.b** investigate and describe the difference between the experimental probability and theoretical probability of an event.

- **DOT PLOTS AND HISTOGRAMS**

- **PS.7.9.a** represent data in a histogram;
- **PS.7.9.b** make observations and inferences about data represented in a histogram; and
- **PS.7.9.c** compare histograms with the same data represented in stem-and-leaf plots, line plots, and circle graphs.