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.

This Tutorial is built to state standards.

Unit 1: Simplifying and Evaluating Expressions

- **SIMPLIFYING SQUARE ROOTS**
  - A1.N.1.1: Write square roots and cube roots of constants and monomial algebraic expressions in simplest radical form.
  - A1.N.1.2: Add, subtract, multiply, divide, and simplify square roots of constants, rationalizing the denominator when necessary.
  - A1.A.3.4: Evaluate linear, absolute value, rational, and radical expressions. Include applying a nonstandard operation such as x y = 2x + y.
- **EVALUATING EXPRESSIONS**
  - A1.A.3.4: Evaluate linear, absolute value, rational, and radical expressions. Include applying a nonstandard operation such as x y = 2x + y.

Unit 2: Comparisons and Magnitude

- **INEQUALITIES AND COMPARISONS**
  - A1.A.2.2: Represent relationships using mathematical models with compound and absolute value inequalities and solve the resulting inequalities by graphing and interpreting the solutions on a number line.
- **ABSOLUTE VALUE**

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- A1.A.2.2: Represent relationships using mathematical models with compound and absolute value inequalities and solve the resulting inequalities by graphing and interpreting the solutions on a number line.

Unit 3: Equations and Inequalities

- **ONE-STEP EQUATIONS AND INEQUALITIES**
  - A1.A.1.1: Use knowledge of solving equations with rational values to represent, use and apply mathematical models (e.g., angle measures, geometric formulas, dimensional analysis, Pythagorean theorem, science, statistics), and interpret the solutions in the original context.
- **MULTI-STEP EQUATIONS AND INEQUALITIES**
  - A1.A.1.1: Use knowledge of solving equations with rational values to represent, use and apply mathematical models (e.g., angle measures, geometric formulas, dimensional analysis, Pythagorean theorem, science, statistics), and interpret the solutions in the original context.
- **LITERAL EQUATIONS**
  - A1.A.3.1: Solve equations involving several variables for one variable in terms of the others.

Unit 4: Understanding Functions

- **FUNCTIONS AND RELATIONS**
  - A1.F.1.1: Distinguish between relations and functions.
  - A1.F.1.2: Identify the dependent variable, independent variable, domain and range given a function, equation, or graph. Identify restrictions on the domain and range in mathematical models.
  - A1.F.1.4: Read and interpret the linear piecewise function, given a graph modeling a situation.
- **DOMAIN AND RANGE**
  - A1.F.1.2: Identify the dependent variable, independent variable, domain and range given a function, equation, or graph. Identify restrictions on the domain and range in mathematical models.
  - A1.F.1.5: Interpret graphs as being discrete or continuous.
- **EVALUATING FUNCTIONS**
  - A1.F.3.2: Use function notation; evaluate a function, including nonlinear, at a given point in its domain algebraically and graphically. Interpret the results in terms of the original context.

Unit 5: Slope and Graphing Linear Functions

- **SLOPE**
  - A1.A.4.1: Analyze, use, and apply mathematical models and other data sets (e.g., graphs, equations, two points, a set of data points) to calculate and interpret slope and the - and -intercepts of a line.
  - A1.A.4.2: Analyze and interpret mathematical models involving lines that are parallel, perpendicular, horizontal, and vertical.
- **GRAPHING AND ANALYZING LINEAR FUNCTIONS**

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- A1.A.4.3: Write the equation of the line given its slope and y-intercept, slope and one point, two points, x- and y-intercepts, or a set of data points.
- A1.A.4.5: Analyze and interpret associations between graphical representations and written scenarios.
- A1.F.1.3: Write linear functions, using function notation, to represent mathematical models.

Unit 6: Graphing Linear Functions and Inequalities

- **GRAPHING AND MANIPULATING Y = MX + B**
  - A1.A.4.4: Express linear equations in slope-intercept, point-slope, and standard forms. Convert between these forms.
  - A1.A.4.5: Analyze and interpret associations between graphical representations and written scenarios.
- **GRAPHS OF LINEAR INEQUALITIES**
  - A1.A.2.1: Represent relationships using mathematical models with linear inequalities; solve the resulting inequalities, graph on a coordinate plane, and interpret the solutions.

Unit 7: Linear Equations

- **SLOPE-INTERCEPT FORM OF A LINEAR EQUATION**
  - A1.A.4.3: Write the equation of the line given its slope and y-intercept, slope and one point, two points, x- and y-intercepts, or a set of data points.
  - A1.A.4.4: Express linear equations in slope-intercept, point-slope, and standard forms. Convert between these forms.
- **POINT-SLOPE FORM OF A LINEAR EQUATION**
  - A1.A.4.3: Write the equation of the line given its slope and y-intercept, slope and one point, two points, x- and y-intercepts, or a set of data points.
  - A1.A.4.4: Express linear equations in slope-intercept, point-slope, and standard forms. Convert between these forms.

Unit 8: Systems of Linear Equations I

- **SOLVING SYSTEMS OF LINEAR EQUATIONS: GUESS AND CHECK**
  - A1.A.1.3: Analyze, use and apply mathematical models to solve problems involving systems of linear equations with a maximum of two variables by graphing, substitution, and elimination. Graphing calculators or other appropriate technology may be utilized. Interpret the solutions in the original context.
- **SOLVING SYSTEMS OF LINEAR EQUATIONS: GRAPHING**
  - A1.A.1.3: Analyze, use and apply mathematical models to solve problems involving systems of linear equations with a maximum of two variables by graphing, substitution, and elimination. Graphing calculators or other appropriate technology may be utilized. Interpret the solutions in the original context.

Unit 9: Systems of Linear Equations II

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- **SOLVING SYSTEMS OF LINEAR EQUATIONS: SUBSTITUTION**
  - A1.A.1.3: Analyze, use and apply mathematical models to solve problems involving systems of linear equations with a maximum of two variables by graphing, substitution, and elimination. Graphing calculators or other appropriate technology may be utilized. Interpret the solutions in the original context.
- **SOLVING SYSTEMS OF LINEAR EQUATIONS: ELIMINATION**
  - A1.A.1.3: Analyze, use and apply mathematical models to solve problems involving systems of linear equations with a maximum of two variables by graphing, substitution, and elimination. Graphing calculators or other appropriate technology may be utilized. Interpret the solutions in the original context.

Unit 10: Operations with Polynomials

- **ADDITION AND SUBTRACTION OF POLYNOMIALS**
  - A1.A.3.2: Simplify polynomial expressions by adding, subtracting, or multiplying.
- **MULTIPLICATION OF POLYNOMIALS**
  - A1.A.3.2: Simplify polynomial expressions by adding, subtracting, or multiplying.

Unit 11: Factoring Polynomials

- **FACTORING QUADRATIC TRINOMIALS**
  - A1.A.3.3: Factor common monomial factors from polynomial expressions and factor quadratic expressions with a leading coefficient of 1.
- **FACTORING SPECIAL CASES**
  - A1.A.3.3: Factor common monomial factors from polynomial expressions and factor quadratic expressions with a leading coefficient of 1.

Unit 12: Linear and Nonlinear Functions

- **LINEAR AND EXPONENTIAL PARENT FUNCTIONS**
  - A1.F.2.1: Distinguish between linear and nonlinear (including exponential) functions. Understand that linear functions grow by equal intervals (arithmetic) and that exponential functions grow by equal factors over equal intervals (geometric).
- **LINEAR VERSUS NONLINEAR FUNCTIONS**
  - A1.F.2.1: Distinguish between linear and nonlinear (including exponential) functions. Understand that linear functions grow by equal intervals (arithmetic) and that exponential functions grow by equal factors over equal intervals (geometric).
- **ABSOLUTE VALUE FUNCTIONS**
  - A1.F.2.2: Recognize the parent functions f(x) = x and f(x) = x. Predict the effects of vertical and horizontal transformations f(x + c) and f(x) + c, algebraically and graphically.

Unit 13: Working with Functions

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- **ARITHMETIC OPERATIONS ON FUNCTIONS**
  - A1.F.3.3: Add, subtract, and multiply functions using function notation.
- **MULTIPLE REPRESENTATIONS OF FUNCTIONS**
  - A1.F.3.1: Identify and generate equivalent representations of linear functions, graphs, tables, and real-world situations.

Unit 14: Probability

- **INTRODUCTION TO PROBABILITY**
  - A1.D.2.2: Given a Venn diagram, determine the probability of the union of events, the intersection of events, and the complement of an event. Understand the relationships between these concepts and the words AND, OR, and NOT.
- **PROBABILITY OF COMPOUND EVENTS**
  - A1.D.2.1: Apply simple counting procedures (factorials, permutations, combinations, and tree diagrams) to determine sample size, sample space, and calculate probabilities.

Unit 15: Applications of Probability

- **GEOMETRIC PROBABILITIES**
  - A1.D.2.2: Given a Venn diagram, determine the probability of the union of events, the intersection of events, and the complement of an event. Understand the relationships between these concepts and the words AND, OR, and NOT.
- **ANALYZING DECISIONS IN PROBABILITY**
  - A1.D.2.4: Apply probability concepts to real-world situations to make informed decisions.
- **COMBINATIONS AND PERMUTATIONS**
  - A1.D.2.1: Apply simple counting procedures (factorials, permutations, combinations, and tree diagrams) to determine sample size, sample space, and calculate probabilities.

Unit 16: Analyzing Data

- **DATA ANALYSIS**
  - A1.D.1.1: Display, describe, and compare data sets using summary statistics (central tendency and spread (range)). Utilize technology (e.g., spreadsheets, calculators) to display data and calculate summary statistics.
- **SCATTERPLOTS**
  - A1.D.1.2: Collect data and analyze scatter plots for patterns, linearity, and outliers.
  - A1.D.1.3: Make predictions based upon the linear regression, and use the correlation coefficient to assess the reliability of those predictions using graphing technology.
- **SIMULATIONS**
  - A1.D.2.3: Use simulations and experiments to calculate experimental probabilities.

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