Kentucky Tutorials are designed specifically for the Kentucky Academic Standards to prepare students for the K-PREP, EOC exams, ACT, and ACT Plan.

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. RATIOS AND RATES

- ## RATIOS
  - **KY.6.RP.1** *Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities.*
  - **KY.6.RP.3.a** *Make tables of equivalent ratios relating quantities with whole-number measurements, find missing values in the tables and plot the pairs of values on the coordinate plane. Use tables to compare ratios.*
  - **KY.6.NS.6.b** *Find and position integers and other rational numbers on a horizontal or vertical number line diagram; find and position pairs of integers and other rational numbers on a coordinate plane.*
  - **KY.6.NS.8** *Solve real-world and mathematical problems by graphing points in all four quadrants of the coordinate plane. Include use of coordinates and absolute value to find distances between points with the same first coordinate or the same second coordinate.*
  - **KY.6.NS.7.b** *Write, interpret and explain statements of order for rational numbers in real-world contexts.*

- ## RATES AND UNIT RATES
  - **KY.6.RP.2** *Understand the concept of a unit rate a/b associated with a ratio $a{:}b$ with $b \neq 0$ and use rate language in the context of a ratio relationship.*
  - **KY.6.RP.3.b** *Solve rate problems including those involving unit pricing and constant speed.*

- ## UNIT CONVERSIONS
  - **KY.6.RP.3.c** *Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities.*

2. DIVISION

- ## DIVIDING FRACTIONS
  - **KY.6.NS.1** *Interpret and compute quotients of fractions and solve word problems involving division of fractions by fractions.*

- ## SOLVING PROBLEMS BY DIVIDING FRACTIONS
  - **KY.6.NS.1** *Interpret and compute quotients of fractions and solve word problems involving division of fractions by fractions.*

3. NUMBER SENSE

- **DECIMAL OPERATIONS**
  - **KY.6.NS.3** *Fluently add, subtract, multiply and divide multi-digit decimals using an algorithm for each operation.*
  - **KY.6.NS.2.a** *Convert a rational number to a decimal using long division.*

- **GREATEST COMMON FACTOR AND LEAST COMMON MULTIPLE**
  - **KY.6.NS.4** *Use the distributive property to express a sum of two whole numbers 1-100 with a common factor as a multiple of a sum of two whole numbers with no common factor.*
  - **KY.6.NS.6.a** *Recognize opposite signs of numbers as indicating locations on opposite sides of 0 on the number line; recognize 0 is its own opposite and the opposite of a positive number is a negative, and the opposite of a negative number is a positive, such as –(–3) = 3.*

4. SIGNED NUMBERS

- **SIGNED NUMBERS**
  - **KY.6.NS.5** *Understand that positive and negative numbers are used together to describe quantities having opposite directions or values; use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation.*
  - **KY.6.NS.6.a** *Recognize opposite signs of numbers as indicating locations on opposite sides of 0 on the number line; recognize 0 is its own opposite and the opposite of a positive number is a negative, and the opposite of a negative number is a positive, such as –(–3) = 3.*
  - **KY.6.NS.6.b** *Find and position integers and other rational numbers on a horizontal or vertical number line diagram; find and position pairs of integers and other rational numbers on a coordinate plane.*

- **INEQUALITIES AND COMPARISON**
  - **KY.6.NS.7.a** *Interpret statements of inequality as statements about the relative position of two numbers on a number line diagram.*
  - **KY.6.NS.7.b** *Write, interpret and explain statements of order for rational numbers in real-world contexts.*
  - **KY.6.EE.8** *Write an inequality of the form $x > c$, $x < c$, $x \geq c$, or $x \leq c$ to represent a constraint or condition in a real-world or mathematical problem. Recognize that inequalities of these forms have infinitely many solutions; represent solutions of such inequalities on vertical and horizontal number lines.*

- **ABSOLUTE VALUE**
  - **KY.6.NS.6.a** *Recognize opposite signs of numbers as indicating locations on opposite sides of 0 on the number line; recognize 0 is its own opposite and the opposite of a positive number is a negative, and the opposite of a negative number is a positive, such as –(–3) = 3.*
  - **KY.6.NS.6.b** *Find and position integers and other rational numbers on a horizontal or vertical number line diagram; find and position pairs of integers and other rational numbers on a coordinate plane.*
  - **KY.6.NS.7.c** *Understand the absolute value of a rational number as its distance from 0 on the number line; interpret absolute value as magnitude for a positive or negative quantity in a real-world situation.*
  - **KY.6.NS.7.d** *Distinguish comparisons of absolute value from statements about order.*
  - **KY.6.NS.7.b** *Write, interpret and explain statements of order for rational numbers in real-world contexts.*

5. THE COORDINATE PLANE

- **PLOTTING POINTS IN THE COORDINATE PLANE**
  - **KY.6.NS.5** *Understand that positive and negative numbers are used together to describe quantities having opposite directions or values; use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation.*
  - **KY.6.NS.6.a** *Recognize opposite signs of numbers as indicating locations on opposite sides of 0 on the number line; recognize 0 is its own opposite and the opposite of a positive number is a negative, and the opposite of a negative number is a positive, such as –(–3) = 3.*
  - **KY.6.NS.6.b** *Find and position integers and other rational numbers on a horizontal or vertical number line diagram; find and position pairs of integers and other rational numbers on a coordinate plane.*

- ○ **KY.6.NS.6.c** *Understand signs of numbers in ordered pairs as indicating locations in quadrants of the coordinate plane; recognize the similarity between whole numbers, their negative opposites and their positions on a number line, ordered pairs differ only by signs and their locations on one or both axes.*
- ○ **KY.6.NS.8** *Solve real-world and mathematical problems by graphing points in all four quadrants of the coordinate plane. Include use of coordinates and absolute value to find distances between points with the same first coordinate or the same second coordinate.*
- ○ **KY.6.G.3** *Draw polygons in the coordinate plane given coordinates for the vertices; use coordinates to find the length of a side joining points with the same first coordinate or the same second coordinate. Apply these techniques in the context of solving real-world and mathematical problems.*

- **QUADRANTS AND AXES**
  - ○ **KY.6.NS.6.b** *Find and position integers and other rational numbers on a horizontal or vertical number line diagram; find and position pairs of integers and other rational numbers on a coordinate plane.*
  - ○ **KY.6.NS.6.c** *Understand signs of numbers in ordered pairs as indicating locations in quadrants of the coordinate plane; recognize the similarity between whole numbers, their negative opposites and their positions on a number line, ordered pairs differ only by signs and their locations on one or both axes.*
  - ○ **KY.6.NS.8** *Solve real-world and mathematical problems by graphing points in all four quadrants of the coordinate plane. Include use of coordinates and absolute value to find distances between points with the same first coordinate or the same second coordinate.*

- **USING GRAPHS TO SOLVE PROBLEMS**
  - ○ **KY.6.NS.8** *Solve real-world and mathematical problems by graphing points in all four quadrants of the coordinate plane. Include use of coordinates and absolute value to find distances between points with the same first coordinate or the same second coordinate.*
  - ○ **KY.6.NS.6.b** *Find and position integers and other rational numbers on a horizontal or vertical number line diagram; find and position pairs of integers and other rational numbers on a coordinate plane.*
  - ○ **KY.6.G.3** *Draw polygons in the coordinate plane given coordinates for the vertices; use coordinates to find the length of a side joining points with the same first coordinate or the same second coordinate. Apply these techniques in the context of solving real-world and mathematical problems.*

6. EXPONENTS AND EXPRESSIONS

- **EXPONENTS**
  - ○ **KY.6.EE.1** *Write and evaluate numerical expressions involving whole-number exponents.*
  - ○ **KY.6.EE.2.c** *Evaluate expressions for specific values of their variables, including values that are non-negative rational numbers. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including whole-number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations). For example,*
  - ○ **KY.6.EE.4** *Identify when two expressions are equivalent when the two expressions name the same number regardless of which value is substituted into them.*

- **UNDERSTANDING PARTS OF EXPRESSIONS**
  - ○ **KY.6.EE.2.b** *Identify parts of an expression using mathematical terms (sums, term, product, factor, quotient, coefficient); view one or more parts of an expression in a single entity. For example,*
  - ○ **KY.6.EE.2.a** *Write expressions that record operations with numbers and with letters standing for numbers. For example,*

- **EQUIVALENT EXPRESSIONS**
  - ○ **KY.6.EE.2.c** *Evaluate expressions for specific values of their variables, including values that are non-negative rational numbers. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including whole-number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations). For example,*
  - ○ **KY.6.EE.3** *Apply the properties of operations to generate equivalent expressions.*
  - ○ **KY.6.EE.4** *Identify when two expressions are equivalent when the two expressions name the same number regardless of which value is substituted into them.*

7. WRITING AND EVALUATING EXPRESSIONS

- ## WRITING EXPRESSIONS
  - ○ **KY.6.EE.2.a** *Write expressions that record operations with numbers and with letters standing for numbers. For example,*
  - ○ **KY.6.EE.2.c** *Evaluate expressions for specific values of their variables, including values that are non-negative rational numbers. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including whole-number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations). For example,*
  - ○ **KY.6.EE.6** *Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or depending on the purpose at hand, any number in a specified set.*

- ## WRITING EXPRESSIONS TO SOLVE PROBLEMS
  - ○ **KY.6.EE.2.a** *Write expressions that record operations with numbers and with letters standing for numbers. For example,*
  - ○ **KY.6.EE.6** *Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or depending on the purpose at hand, any number in a specified set.*
  - ○ **KY.6.EE.9.a** *Appropriately recognize one quantity as the dependent variable and the other as the independent variable.*
  - ○ **KY.6.EE.9.b** *Write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable.*
  - ○ **KY.6.EE.2.c** *Evaluate expressions for specific values of their variables, including values that are non-negative rational numbers. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including whole-number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations). For example,*

- ## EVALUATING EXPRESSIONS
  - ○ **KY.6.EE.2.c** *Evaluate expressions for specific values of their variables, including values that are non-negative rational numbers. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including whole-number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations). For example,*

8. BASICS OF EQUATIONS

- ## INDEPENDENT AND DEPENDENT VARIABLES
  - ○ **KY.6.EE.2.a** *Write expressions that record operations with numbers and with letters standing for numbers. For example,*
  - ○ **KY.6.EE.6** *Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or depending on the purpose at hand, any number in a specified set.*
  - ○ **KY.6.EE.9.a** *Appropriately recognize one quantity as the dependent variable and the other as the independent variable.*
  - ○ **KY.6.EE.9.b** *Write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable.*
  - ○ **KY.6.EE.9.c** *Analyze the relationship between the dependent and independent variables using graphs and tables and relate these to the question.*

- ## MULTIPLE REPRESENTATIONS: TABLES, GRAPHS, AND EQUATIONS
  - ○ **KY.6.EE.9.a** *Appropriately recognize one quantity as the dependent variable and the other as the independent variable.*
  - ○ **KY.6.EE.9.c** *Analyze the relationship between the dependent and independent variables using graphs and tables and relate these to the question.*

9. SOLVING EQUATIONS AND INEQUALITIES 1

- ## SOLUTIONS OF EQUATIONS AND INEQUALITIES
  - ○ **KY.6.EE.5** *Understand solving an equation or inequality as a process of answering a question: which values from a specified set, if any, make the equation or inequality true? Use substitution to determine whether a given number in a specified set makes an equation or inequality true.*

- **KY.6.EE.7** *Solve real-world and mathematical problems by writing and solving equations of the form $x + p = q$ and $px =$ for cases in which p, q and x are all nonnegative rational numbers.*

- **SOLVING ADDITION EQUATIONS**

    - **KY.6.EE.5** *Understand solving an equation or inequality as a process of answering a question: which values from a specified set, if any, make the equation or inequality true? Use substitution to determine whether a given number in a specified set makes an equation or inequality true.*
    - **KY.6.EE.7** *Solve real-world and mathematical problems by writing and solving equations of the form $x + p = q$ and $px =$ for cases in which p, q and x are all nonnegative rational numbers.*

10. SOLVING EQUATIONS AND INEQUALITIES 2

- **SOLVING MULTIPLICATION EQUATIONS**

    - **KY.6.EE.5** *Understand solving an equation or inequality as a process of answering a question: which values from a specified set, if any, make the equation or inequality true? Use substitution to determine whether a given number in a specified set makes an equation or inequality true.*
    - **KY.6.EE.7** *Solve real-world and mathematical problems by writing and solving equations of the form $x + p = q$ and $px =$ for cases in which p, q and x are all nonnegative rational numbers.*

- **SOLVING INEQUALITIES**

    - **KY.6.EE.5** *Understand solving an equation or inequality as a process of answering a question: which values from a specified set, if any, make the equation or inequality true? Use substitution to determine whether a given number in a specified set makes an equation or inequality true.*
    - **KY.6.EE.8** *Write an inequality of the form $x > c$, $x < c$, $x \geq c$, or $x \leq c$ to represent a constraint or condition in a real-world or mathematical problem. Recognize that inequalities of these forms have infinitely many solutions; represent solutions of such inequalities on vertical and horizontal number lines.*

11. AREA AND VOLUME

- **AREA**

    - **KY.6.G.1** *Find the area of right triangles, other triangles, special quadrilaterals and polygons by composing into rectangles or decomposing into triangles and quadrilaterals; apply these techniques in the context of solving real-world and mathematical problems.*

- **VOLUME**

    - **KY.6.G.2** *Find the volume of a right rectangular prism with rational number edge lengths. Apply the formulas $V = lwh$ and $= Bh$ to find volumes of right rectangular prisms with rational number edge lengths in the context of solving real-world and mathematical problems.*

12. GEOMETRY

- **COORDINATE GEOMETRY**

    - **KY.6.NS.6.b** *Find and position integers and other rational numbers on a horizontal or vertical number line diagram; find and position pairs of integers and other rational numbers on a coordinate plane.*
    - **KY.6.NS.8** *Solve real-world and mathematical problems by graphing points in all four quadrants of the coordinate plane. Include use of coordinates and absolute value to find distances between points with the same first coordinate or the same second coordinate.*
    - **KY.6.G.3** *Draw polygons in the coordinate plane given coordinates for the vertices; use coordinates to find the length of a side joining points with the same first coordinate or the same second coordinate. Apply these techniques in the context of solving real-world and mathematical problems.*

- **SOLID FIGURES**

    - **KY.6.G.4** *Classify three-dimensional figures including cubes, prisms, pyramids, cones and spheres.*

13. INTRODUCTION TO STATISTICS

- **STATISTICAL QUESTIONS AND DATA DISTRIBUTIONS**
  - **KY.6.SP.0.b** *Collect Data: Design and use a plan to collect appropriate data to answer a statistical question.*
  - **KY.6.SP.1** *Recognize a statistical question as one that anticipates variability in the data related to the question and accounts for it in the answers.*
  - **KY.6.SP.0.a** *Formulate Questions: Formulate a statistical question as one that anticipates variability and can be answered with data.*
  - **KY.6.SP.2** *Understand that a set of numerical data collected to answer a statistical question has a distribution which can be described by its center, spread and overall shape.*
  - **KY.6.SP.3** *Recognize that a measure of center for a numerical data set summarizes all of its values with a single number to describe a typical value, while a measure of variation describes how the values in the distribution vary.*
  - **KY.6.SP.5.c** *Determining quantitative measures of center (median and/or mean) to describe distribution of numerical data.*
  - **KY.6.SP.5.d** *Describing distributions of numerical data qualitatively relating to shape (using terms such as cluster, mode(s), gap, symmetric, uniform, skewed-left, skewed-right and the presence of outliers) and quantitatively relating to spread/variability (using terms such as range and interquartile range).*
  - **KY.6.SP.5.e** *Relating the choice of measures of center and variability to the shape of the data distribution.*
  - **KY.6.SP.5.b** *Describing the nature of the attribute under investigation, including how it was measured and its units of measurement.*
  - **KY.6.SP.0.d** *Interpret Results: Draw logical conclusions and make generalizations from the data based on the original question.*

- **MEASURES OF CENTER AND VARIABILITY**
  - **KY.6.SP.0.c** *Analyze Data: Select appropriate graphical methods and numerical measures to analyze data by displaying variability within a group, comparing individual to individual and comparing individual to group.*
  - **KY.6.SP.2** *Understand that a set of numerical data collected to answer a statistical question has a distribution which can be described by its center, spread and overall shape.*
  - **KY.6.SP.3** *Recognize that a measure of center for a numerical data set summarizes all of its values with a single number to describe a typical value, while a measure of variation describes how the values in the distribution vary.*
  - **KY.6.SP.5.c** *Determining quantitative measures of center (median and/or mean) to describe distribution of numerical data.*
  - **KY.6.SP.5.d** *Describing distributions of numerical data qualitatively relating to shape (using terms such as cluster, mode(s), gap, symmetric, uniform, skewed-left, skewed-right and the presence of outliers) and quantitatively relating to spread/variability (using terms such as range and interquartile range).*

14. DATA DISPLAYS

- **BOX PLOTS**
  - **KY.6.SP.4** *Display the distribution of numerical data in plots on a number line, including dot plots, histograms and box plots.*
  - **KY.6.SP.5.c** *Determining quantitative measures of center (median and/or mean) to describe distribution of numerical data.*
  - **KY.6.SP.5.b** *Describing the nature of the attribute under investigation, including how it was measured and its units of measurement.*
  - **KY.6.SP.5.d** *Describing distributions of numerical data qualitatively relating to shape (using terms such as cluster, mode(s), gap, symmetric, uniform, skewed-left, skewed-right and the presence of outliers) and quantitatively relating to spread/variability (using terms such as range and interquartile range).*
  - **KY.6.SP.2** *Understand that a set of numerical data collected to answer a statistical question has a distribution which can be described by its center, spread and overall shape.*
  - **KY.6.SP.3** *Recognize that a measure of center for a numerical data set summarizes all of its values with a single number to describe a typical value, while a measure of variation describes how the values in the distribution vary.*

- **DOT PLOTS AND HISTOGRAMS**
  - **KY.6.SP.4** *Display the distribution of numerical data in plots on a number line, including dot plots, histograms and box plots.*
  - **KY.6.SP.0.c** *Analyze Data: Select appropriate graphical methods and numerical measures to analyze data by displaying variability within a group, comparing individual to individual and comparing individual to group.*

15. SUMMARIZING DATA

- **COLLECTING DATA**
  - **KY.6.SP.0.b** *Collect Data: Design and use a plan to collect appropriate data to answer a statistical question.*
  - **KY.6.SP.5.a** *Reporting the number of observations.*
  - **KY.6.SP.5.b** *Describing the nature of the attribute under investigation, including how it was measured and its units of measurement.*
  - **KY.6.SP.5.d** *Describing distributions of numerical data qualitatively relating to shape (using terms such as cluster, mode(s), gap, symmetric, uniform, skewed-left, skewed-right and the presence of outliers) and quantitatively relating to spread/variability (using terms such as range and interquartile range).*

- **SUMMARIZING DATA USING MEASURES OF CENTER AND VARIABILITY**
  - **KY.6.SP.5.c** *Determining quantitative measures of center (median and/or mean) to describe distribution of numerical data.*
  - **KY.6.SP.5.d** *Describing distributions of numerical data qualitatively relating to shape (using terms such as cluster, mode(s), gap, symmetric, uniform, skewed-left, skewed-right and the presence of outliers) and quantitatively relating to spread/variability (using terms such as range and interquartile range).*
  - **KY.6.SP.2** *Understand that a set of numerical data collected to answer a statistical question has a distribution which can be described by its center, spread and overall shape.*
  - **KY.6.SP.3** *Recognize that a measure of center for a numerical data set summarizes all of its values with a single number to describe a typical value, while a measure of variation describes how the values in the distribution vary.*
  - **KY.6.SP.0.d** *Interpret Results: Draw logical conclusions and make generalizations from the data based on the original question.*

- **CHOOSING APPROPRIATE MEASURES TO SUMMARIZE DATA SETS**
  - **KY.6.SP.0.c** *Analyze Data: Select appropriate graphical methods and numerical measures to analyze data by displaying variability within a group, comparing individual to individual and comparing individual to group.*
  - **KY.6.SP.2** *Understand that a set of numerical data collected to answer a statistical question has a distribution which can be described by its center, spread and overall shape.*
  - **KY.6.SP.3** *Recognize that a measure of center for a numerical data set summarizes all of its values with a single number to describe a typical value, while a measure of variation describes how the values in the distribution vary.*
  - **KY.6.SP.5.c** *Determining quantitative measures of center (median and/or mean) to describe distribution of numerical data.*
  - **KY.6.SP.5.e** *Relating the choice of measures of center and variability to the shape of the data distribution.*
  - **KY.6.SP.5.d** *Describing distributions of numerical data qualitatively relating to shape (using terms such as cluster, mode(s), gap, symmetric, uniform, skewed-left, skewed-right and the presence of outliers) and quantitatively relating to spread/variability (using terms such as range and interquartile range).*