Keystone EOC Tutorials for Pennsylvania are designed specifically for the Pennsylvania Core Standards to prepare students for the Keystone end-of-course assessments. EOC Categories are at the heart of Keystone EOC Tutorial structure – bringing category-based learning to the student experience, and category-based performance and progress tracking to the teacher experience.

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.

Test-Taking Strategies for EOC Tutorials allow students to practice and apply learning approaches that will hone their test-taking skills and focus them for success on the day of their EOC test.

Unit 1: Real Numbers

- **GREATEST COMMON FACTOR AND LEAST COMMON MULTIPLE**
  - A1.1.1.2.1: Operations and Linear Equations & Inequalities Operations with Real Numbers and Expressions Apply number theory concepts to show relationships between real numbers in problem-solving settings. Find the Greatest Common Factor (GCF) and/or the Least Common Multiple (LCM) for sets of monomials.
- **APPROXIMATING IRRATIONAL NUMBERS**
  - A1.1.1.1.1: Operations and Linear Equations & Inequalities Operations with Real Numbers and Expressions Represent and/or use numbers in equivalent forms (e.g., integers, fractions, decimals, percents, square roots, and exponents). Compare and/or order any real numbers.

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- **MONITORING PRECISION AND ACCURACY**
  - A1.1.1.4.1: Operations and Linear Equations & Inequalities Operations with Real Numbers and Expressions Use estimation strategies in problem-solving situations. Use estimation to solve problems.

Unit 2: Exponents and Roots

- **LAWS OF EXPONENTS**
  - A1.1.1.3.1: Operations and Linear Equations & Inequalities Operations with Real Numbers and Expressions Use exponents, roots, and/or absolute values to solve problems. Simplify/evaluate expressions involving properties/laws of exponents, roots, and/or absolute values to solve problems.
- **SIMPLIFYING SQUARE ROOTS**
  - A1.1.1.1.2: Operations and Linear Equations & Inequalities Operations with Real Numbers and Expressions Represent and/or use numbers in equivalent forms (e.g., integers, fractions, decimals, percents, square roots, and exponents). Simplify square roots (e.g., square root of 24 = 2 square root of 6).
  - A1.1.1.3.1: Operations and Linear Equations & Inequalities Operations with Real Numbers and Expressions Use exponents, roots, and/or absolute values to solve problems. Simplify/evaluate expressions involving properties/laws of exponents, roots, and/or absolute values to solve problems.

Unit 3: Expressions and Equations

- **ONE-STEP EQUATIONS AND INEQUALITIES**
  - A1.1.3.1.3: Operations and Linear Equations & Inequalities Linear Inequalities Write, solve, and/or graph linear inequalities using various methods. Interpret solutions to problems in the context of the problem situation.
  - A1.1.3.1.2: Operations and Linear Equations & Inequalities Linear Inequalities Write, solve, and/or graph linear inequalities using various methods. Identify or graph the solution set to a linear inequality on a number line.
- **MULTI-STEP EQUATIONS AND INEQUALITIES**
  - A1.1.3.1.2: Operations and Linear Equations & Inequalities Linear Inequalities Write, solve, and/or graph linear inequalities using various methods. Identify or graph the solution set to a linear inequality on a number line.
  - A1.1.3.1.3: Operations and Linear Equations & Inequalities Linear Inequalities Write, solve, and/or graph linear inequalities using various methods. Interpret solutions to problems in the context of the problem situation.
- **AXIOMS OF EQUALITY**
  - A1.1.2.1.2: Operations and Linear Equations & Inequalities Linear Equations Write, solve, and/or graph linear equations using various methods. Use and/or identify an algebraic property to justify any step in an equation-solving process.

Unit 4: Functions

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- **FUNCTIONS AND RELATIONS**
  - A1.2.1.1.2: Linear Functions and Data Organizations Functions Analyze and/or use patterns or relations. Determine whether a relation is a function, given a set of points or a graph.
- **DOMAIN AND RANGE**
  - A1.2.1.1.3: Linear Functions and Data Organizations Functions Analyze and/or use patterns or relations. Identify the domain or range of a relation (may be presented as ordered pairs, a graph, or a table).

Unit 5: Graphs of Linear Functions

- **SLOPE**
  - A1.2.2.1.1: Linear Functions and Data Organizations Coordinate Geometry Describe, compute, and/or use the rate of change (slope) of a line. Identify, describe, and/or use constant rates of change.
  - A1.2.2.1.4: Linear Functions and Data Organizations Coordinate Geometry Describe, compute, and/or use the rate of change (slope) of a line. Determine the slope and/or y-intercept represented by a linear equation or graph.
  - A1.2.2.1.2: Linear Functions and Data Organizations Coordinate Geometry Describe, compute, and/or use the rate of change (slope) of a line. Apply the concept of linear rate of change (slope) to solve problems.
  - A1.1.2.1.3: Operations and Linear Equations & Inequalities Linear Equations Write, solve, and/or graph linear equations using various methods. Interpret solutions to problems in the context of the problem situation.
- **GRAPHING AND ANALYZING LINEAR FUNCTIONS**
  - A1.1.2.1.1: Operations and Linear Equations & Inequalities Linear Equations Write, solve, and/or graph linear equations using various methods. Write, solve, and/or apply a linear equation (including problem situations).
  - A1.2.1.2.1: Linear Functions and Data Organizations Functions Interpret and/or use linear functions and their equations, graphs, or tables. Create, interpret, and/or use the equation, graph, or table of a linear function.
  - A1.2.1.2.2: Linear Functions and Data Organizations Functions Interpret and/or use linear functions and their equations, graphs, or tables. Translate from one representation of a linear function to another (i.e., graph, table, and equation).
  - A1.1.2.1.3: Operations and Linear Equations & Inequalities Linear Equations Write, solve, and/or graph linear equations using various methods. Interpret solutions to problems in the context of the problem situation.
  - A1.2.2.1.4: Linear Functions and Data Organizations Coordinate Geometry Describe, compute, and/or use the rate of change (slope) of a line. Determine the slope and/or y-intercept represented by a linear equation or graph.
- **GRAPHING AND MANIPULATING Y = MX + B**

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- A1.2.1.2.1: Linear Functions and Data Organizations Functions Interpret and/or use linear functions and their equations, graphs, or tables. Create, interpret, and/or use the equation, graph, or table of a linear function.
- A1.2.2.1.3.a: Linear Functions and Data Organizations Coordinate Geometry Describe, compute, and/or use the rate of change (slope) of a line. Write or identify a linear equation when given the graph of the line,
- A1.2.2.1.3.b: Linear Functions and Data Organizations Coordinate Geometry Describe, compute, and/or use the rate of change (slope) of a line. Write or identify a linear equation when given two points on the line, or
- A1.2.2.1.3.c: Linear Functions and Data Organizations Coordinate Geometry Describe, compute, and/or use the rate of change (slope) of a line. Write or identify a linear equation when given the slope and a point on the line.
- A1.1.2.1.3: Operations and Linear Equations & Inequalities Linear Equations Write, solve, and/or graph linear equations using various methods. Interpret solutions to problems in the context of the problem situation.
- A1.1.2.1.1: Operations and Linear Equations & Inequalities Linear Equations Write, solve, and/or graph linear equations using various methods. Write, solve, and/or apply a linear equation (including problem situations).

Unit 6: Linear Equations

- **SLOPE-INTERCEPT FORM OF A LINEAR EQUATION**
  - A1.2.1.2.1: Linear Functions and Data Organizations Functions Interpret and/or use linear functions and their equations, graphs, or tables. Create, interpret, and/or use the equation, graph, or table of a linear function.
  - A1.2.2.1.1: Linear Functions and Data Organizations Coordinate Geometry Describe, compute, and/or use the rate of change (slope) of a line. Identify, describe, and/or use constant rates of change.
  - A1.2.2.1.2: Linear Functions and Data Organizations Coordinate Geometry Describe, compute, and/or use the rate of change (slope) of a line. Apply the concept of linear rate of change (slope) to solve problems.
  - A1.1.2.1.1: Operations and Linear Equations & Inequalities Linear Equations Write, solve, and/or graph linear equations using various methods. Write, solve, and/or apply a linear equation (including problem situations).
  - A1.2.1.2.2: Linear Functions and Data Organizations Functions Interpret and/or use linear functions and their equations, graphs, or tables. Translate from one representation of a linear function to another (i.e., graph, table, and equation).
  - A1.2.2.1.3.a: Linear Functions and Data Organizations Coordinate Geometry Describe, compute, and/or use the rate of change (slope) of a line. Write or identify a linear equation when given the graph of the line,

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- A1.2.2.1.3.b: Linear Functions and Data Organizations Coordinate Geometry Describe, compute, and/or use the rate of change (slope) of a line. Write or identify a linear equation when given two points on the line, or
- A1.2.2.1.3.c: Linear Functions and Data Organizations Coordinate Geometry Describe, compute, and/or use the rate of change (slope) of a line. Write or identify a linear equation when given the slope and a point on the line.
- A1.1.2.1.3: Operations and Linear Equations & Inequalities Linear Equations Write, solve, and/or graph linear equations using various methods. Interpret solutions to problems in the context of the problem situation.

- **POINT-SLOPE FORM OF A LINEAR EQUATION**
  - A1.1.2.1.1: Operations and Linear Equations & Inequalities Linear Equations Write, solve, and/or graph linear equations using various methods. Write, solve, and/or apply a linear equation (including problem situations).
  - A1.2.1.2.1: Linear Functions and Data Organizations Functions Interpret and/or use linear functions and their equations, graphs, or tables. Create, interpret, and/or use the equation, graph, or table of a linear function.
  - A1.2.1.2.2: Linear Functions and Data Organizations Functions Interpret and/or use linear functions and their equations, graphs, or tables. Translate from one representation of a linear function to another (i.e., graph, table, and equation).
  - A1.2.2.1.3.a: Linear Functions and Data Organizations Coordinate Geometry Describe, compute, and/or use the rate of change (slope) of a line. Write or identify a linear equation when given the graph of the line,
  - A1.2.2.1.3.b: Linear Functions and Data Organizations Coordinate Geometry Describe, compute, and/or use the rate of change (slope) of a line. Write or identify a linear equation when given two points on the line, or
  - A1.2.2.1.3.c: Linear Functions and Data Organizations Coordinate Geometry Describe, compute, and/or use the rate of change (slope) of a line. Write or identify a linear equation when given the slope and a point on the line.
  - A1.2.2.1.4: Linear Functions and Data Organizations Coordinate Geometry Describe, compute, and/or use the rate of change (slope) of a line. Determine the slope and/or y-intercept represented by a linear equation or graph.
  - A1.2.2.1.2: Linear Functions and Data Organizations Coordinate Geometry Describe, compute, and/or use the rate of change (slope) of a line. Apply the concept of linear rate of change (slope) to solve problems.
  - A1.2.2.1.1: Linear Functions and Data Organizations Coordinate Geometry Describe, compute, and/or use the rate of change (slope) of a line. Identify, describe, and/or use constant rates of change.

Unit 7: Graphs of Linear Systems

- **SOLVING SYSTEMS OF LINEAR EQUATIONS: GRAPHING**

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- A1.1.2.2.1: Operations and Linear Equations & Inequalities Linear Equations Write, solve, and/or graph systems of linear equations using various methods. Write and/or solve a system of linear equations (including problem situations) using graphing, substitution, and/or elimination.
- A1.1.2.2.2: Operations and Linear Equations & Inequalities Linear Equations Write, solve, and/or graph systems of linear equations using various methods. Interpret solutions to problems in the context of the problem situation.

- **SOLVING SYSTEMS OF LINEAR INEQUALITIES**
  - A1.1.3.2.1: Operations and Linear Equations & Inequalities Linear Inequalities Write, solve, and/or graph systems of linear inequalities using various methods. Write and/or solve a system of linear inequalities using graphing.
  - A1.1.3.2.2: Operations and Linear Equations & Inequalities Linear Inequalities Write, solve, and/or graph systems of linear inequalities using various methods. Interpret solutions to problems in the context of the problem situation.

Unit 8: Linear Systems of Equations

- **SOLVING SYSTEMS OF LINEAR EQUATIONS: SUBSTITUTION**
  - A1.1.2.2.1: Operations and Linear Equations & Inequalities Linear Equations Write, solve, and/or graph systems of linear equations using various methods. Write and/or solve a system of linear equations (including problem situations) using graphing, substitution, and/or elimination.
  - A1.1.2.2.2: Operations and Linear Equations & Inequalities Linear Equations Write, solve, and/or graph systems of linear equations using various methods. Interpret solutions to problems in the context of the problem situation.
- **SOLVING SYSTEMS OF LINEAR EQUATIONS: ELIMINATION**
  - A1.1.2.2.1: Operations and Linear Equations & Inequalities Linear Equations Write, solve, and/or graph systems of linear equations using various methods. Write and/or solve a system of linear equations (including problem situations) using graphing, substitution, and/or elimination.
  - A1.1.2.2.2: Operations and Linear Equations & Inequalities Linear Equations Write, solve, and/or graph systems of linear equations using various methods. Interpret solutions to problems in the context of the problem situation.

Unit 9: Polynomial Expressions

- **ADDITION AND SUBTRACTION OF POLYNOMIALS**
  - A1.1.1.5.1: Operations and Linear Equations & Inequalities Operations with Real Numbers and Expressions Simplify expressions involving polynomials. Add, subtract, and/or multiply polynomial expressions (express answers in simplest form).
- **MULTIPLICATION OF POLYNOMIALS**
  - A1.1.1.5.1: Operations and Linear Equations & Inequalities Operations with Real Numbers and Expressions Simplify expressions involving polynomials. Add, subtract, and/or multiply polynomial expressions (express answers in simplest form).

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Unit 10: Sequences

- **SEQUENCES**
  - A1.2.1.1.1: Linear Functions and Data Organizations Functions Analyze and/or use patterns or relations. Analyze a set of data for the existence of a pattern and represent the pattern algebraically and/or graphically.
- **ARITHMETIC AND GEOMETRIC SEQUENCES**
  - A1.2.1.1.1: Linear Functions and Data Organizations Functions Analyze and/or use patterns or relations. Analyze a set of data for the existence of a pattern and represent the pattern algebraically and/or graphically.

Unit 11: Factoring

- **FACTORING POLYNOMIALS WITH GCF**
  - A1.1.1.2.1: Operations and Linear Equations & Inequalities Operations with Real Numbers and Expressions Apply number theory concepts to show relationships between real numbers in problem-solving settings. Find the Greatest Common Factor (GCF) and/or the Least Common Multiple (LCM) for sets of monomials.
  - A1.1.1.5.2: Operations and Linear Equations & Inequalities Operations with Real Numbers and Expressions Simplify expressions involving polynomials. Factor algebraic expressions, including difference of squares and trinomials.
- **FACTORING QUADRATIC TRINOMIALS**
  - A1.1.1.5.2: Operations and Linear Equations & Inequalities Operations with Real Numbers and Expressions Simplify expressions involving polynomials. Factor algebraic expressions, including difference of squares and trinomials.
- **FACTORING SPECIAL CASES**
  - A1.1.1.5.2: Operations and Linear Equations & Inequalities Operations with Real Numbers and Expressions Simplify expressions involving polynomials. Factor algebraic expressions, including difference of squares and trinomials.

Unit 12: Data Analysis

- **DOT PLOTS AND HISTOGRAMS**
  - A1.2.3.2.1: Linear Functions and Data Organizations Data Analysis Use data displays in problem-solving settings and/or to make predictions. Estimate or calculate to make predictions based on a circle, line, bar graph, measures of central tendency, or other representations.
- **DATA ANALYSIS**
  - A1.2.3.1.1: Linear Functions and Data Organizations Data Analysis Use measures of dispersion to describe a set of data. Calculate and/or interpret the range, quartiles, and interquartile range of data.
  - A1.2.3.2.2: Linear Functions and Data Organizations Data Analysis Use data displays in problem-solving settings and/or to make predictions. Analyze data, make predictions, and/or answer questions

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based on displayed data (box-and-whisker plots, stem-and-leaf plots, scatter plots, measures of central tendency, or other representations).

Unit 13: Scatterplots

- **SCATTERPLOTS**
  - A1.2.3.2.2: Linear Functions and Data Organizations Data Analysis Use data displays in problem-solving settings and/or to make predictions. Analyze data, make predictions, and/or answer questions based on displayed data (box-and-whisker plots, stem-and-leaf plots, scatter plots, measures of central tendency, or other representations).
  - A1.2.3.2.3: Linear Functions and Data Organizations Data Analysis Use data displays in problem-solving settings and/or to make predictions. Make predictions using the equations or graphs of best-fit lines of scatter plots.
  - A1.2.2.2.1: Linear Functions and Data Organizations Coordinate Geometry Analyze and/or interpret data on a scatter plot. Draw, identify, find, and/or write an equation for a line of best fit for a scatter plot.
- **SCATTERPLOTS AND MODELING**
  - A1.2.2.2.1: Linear Functions and Data Organizations Coordinate Geometry Analyze and/or interpret data on a scatter plot. Draw, identify, find, and/or write an equation for a line of best fit for a scatter plot.
  - A1.2.3.2.2: Linear Functions and Data Organizations Data Analysis Use data displays in problem-solving settings and/or to make predictions. Analyze data, make predictions, and/or answer questions based on displayed data (box-and-whisker plots, stem-and-leaf plots, scatter plots, measures of central tendency, or other representations).
  - A1.2.3.2.3: Linear Functions and Data Organizations Data Analysis Use data displays in problem-solving settings and/or to make predictions. Make predictions using the equations or graphs of best-fit lines of scatter plots.

Unit 14: Probability

- **PROBABILITY OF COMPOUND EVENTS**
  - A1.2.3.3.1: Linear Functions and Data Organizations Data Analysis Apply probability to practical situations. Find probabilities for compound events (e.g., find probability of red and blue, find probability of red or blue) and represent as a fraction, decimal, or percent.

Unit 15: Test-Taking Strategies

- **STUDY HABITS**
- **BEING PREPARED AND GETTING STARTED**
- **WORDING IN TEST QUESTIONS**
- **WORDING IN ANSWER CHOICES**
- **QUESTIONS WITH PASSAGES AND VISUAL DATA**

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- **ESSAY AND SHORT ANSWER QUESTIONS**
- **WORD PROBLEMS**

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