OHEOC Tutorials for Ohio are designed specifically for the Ohio Learning Standards to prepare students for the Ohio End Of Course assessments. EOC Categories are at the heart of OHEOC 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.

1. ALGEBRAIC EXPRESSIONS

- **LAWS OF EXPONENTS**
  - **OH.Math.HSA.SSE.3c** *Use the properties of exponents to transform expressions for exponential functions.*

- **FORMULATING AND SIMPLIFYING ALGEBRAIC EXPRESSIONS**
  - **OH.Math.HSA.SSE.1a** *Interpret parts of an expression, such as terms, factors, and coefficients.*

2. SOLVING EQUATIONS

- **ONE-STEP EQUATIONS AND INEQUALITIES**
  - **OH.Math.HSA.CED.1b** *Focus on applying simple quadratic expressions.*

- **MULTI-STEP EQUATIONS AND INEQUALITIES**
  - **OH.Math.HSA.CED.1b** *Focus on applying simple quadratic expressions.*

- **LITERAL EQUATIONS**
  - **OH.Math.HSA.CED.4c** *Focus on formulas in which the variable of interest is linear or square.*

3. FUNCTIONS

- **FUNCTIONS AND RELATIONS**
  - **OH.Math.HSF.IF.4b** *Focus on linear, quadratic, and exponential functions.*

- **DOMAIN AND RANGE**

- **OH.Math.HSF.IF.5b** *Focus on linear, quadratic, and exponential functions.*

- **MULTIPLE REPRESENTATIONS OF FUNCTIONS**
  - **OH.Math.HSF.IF.9b** *Focus on linear, quadratic, and exponential functions.*

4. EXPONENTIAL FUNCTIONS

- **EXPONENTIAL FUNCTIONS**
  - **OH.Math.HSF.IF.8b.i** *Focus on exponential functions evaluated at integer inputs.*
  - **OH.Math.HSF.BF.1a.ii** *Focus on situations that exhibit quadratic or exponential relationships.*

- **EXPONENTIAL GROWTH AND DECAY**
  - **OH.Math.HSF.IF.8b.i** *Focus on exponential functions evaluated at integer inputs.*
  - **OH.Math.HSF.LE.3** *Observe using graphs and tables that a quantity increasing exponentially eventually exceeds a quantity increasing linearly or quadratically.*

5. POLYNOMIALS

- **ADDITION AND SUBTRACTION OF POLYNOMIALS**
  - **OH.Math.HSA.APR.1a** *Focus on polynomial expressions that simplify to forms that are linear or quadratic.*

- **MULTIPLICATION OF POLYNOMIALS**
  - **OH.Math.HSA.APR.1a** *Focus on polynomial expressions that simplify to forms that are linear or quadratic.*

6. FACTORING

- **FACTORING QUADRATIC TRINOMIALS**
  - **OH.Math.HSA.SSE.3a** *Factor a quadratic expression to reveal the zeros of the function it defines.*
  - **OH.Math.HSA.SSE.2** *Use the structure of an expression to identify ways to rewrite it.*

- **FACTORING SPECIAL CASES**
  - **OH.Math.HSA.SSE.2** *Use the structure of an expression to identify ways to rewrite it.*
  - **OH.Math.HSA.SSE.3a** *Factor a quadratic expression to reveal the zeros of the function it defines.*

7. QUADRATIC FUNCTIONS

- **QUADRATIC FUNCTIONS**
  - **OH.Math.HSF.IF.7b** *Graph quadratic functions and indicate intercepts, maxima, and minima.*
  - **OH.Math.HSF.IF.4b** *Focus on linear, quadratic, and exponential functions.*

- **QUADRATIC PARENT FUNCTION**
  - **OH.Math.HSF.IF.4b** *Focus on linear, quadratic, and exponential functions.*
  - **OH.Math.HSF.IF.5b** *Focus on linear, quadratic, and exponential functions.*

- **ANALYZING GRAPHS OF QUADRATIC FUNCTIONS**
  - **OH.Math.HSF.BF.3a** *Focus on transformations of graphs of quadratic functions, except for f(kx).*
  - **OH.Math.HSF.IF.7b** *Graph quadratic functions and indicate intercepts, maxima, and minima.*

- **TRANSFORMATIONS OF THE QUADRATIC PARENT FUNCTION**

- **OH.Math.HSF.BF.3a** *Focus on transformations of graphs of quadratic functions, except for f(kx).*

8. SOLVING QUADRATIC EQUATIONS

- **REPRESENTATIONS OF QUADRATIC FUNCTIONS**

  - **OH.Math.HSA.CED.2b** *Focus on applying simple quadratic expressions.*
  - **OH.Math.HSF.BF.1a.ii** *Focus on situations that exhibit quadratic or exponential relationships.*
  - **OH.Math.HSA.SSE.1b** *Interpret complicated expressions by viewing one or more of their parts as a single entity.*

- **SOLVING QUADRATIC EQUATIONS BY FACTORING**

  - **OH.Math.HSA.REI.4b** *Solve quadratic equations as appropriate to the initial form of the equation by inspection, e.g., for x^2 = 49; taking square roots; completing the square; applying the quadratic formula; or utilizing the Zero-Product Property after factoring.*
  - **OH.Math.HSF.IF.8a.i** *Focus on completing the square to quadratic functions with the leading coefficient of 1.*

- **COMPLETING THE SQUARE**

  - **OH.Math.HSA.REI.4b** *Solve quadratic equations as appropriate to the initial form of the equation by inspection, e.g., for x^2 = 49; taking square roots; completing the square; applying the quadratic formula; or utilizing the Zero-Product Property after factoring.*
  - **OH.Math.HSF.IF.8a.i** *Focus on completing the square to quadratic functions with the leading coefficient of 1.*
  - **OH.Math.HSA.REI.4a** *Use the method of completing the square to transform any quadratic equation in x into an equation of the form $(x - p)^2 = q$ that has the same solutions.*
  - **OH.Math.HSA.SSE.3b** *Complete the square in a quadratic expression to reveal the maximum or minimum value of the function it defines.*

9. QUADRATIC FORMULA

- **QUADRATIC FORMULA**

  - **OH.Math.HSA.REI.4b** *Solve quadratic equations as appropriate to the initial form of the equation by inspection, e.g., for x^2 = 49; taking square roots; completing the square; applying the quadratic formula; or utilizing the Zero-Product Property after factoring.*

10. SYSTEMS OF NONLINEAR EQUATIONS

- **SYSTEMS OF NONLINEAR EQUATIONS**

  - **OH.Math.HSA.REI.7** *Solve a simple system consisting of a linear equation and a quadratic equation in two variables algebraically and graphically.*
  - **OH.Math.HSA.REI.11** *Explain why the x-coordinates of the points where the graphs of the equation $y = f(x)$ and $y = (x)$ intersect are the solutions of the equation $f(x) = g(x)$; find the solutions approximately, e.g., using technology to graph the functions, making tables of values, or finding successive approximations.*

11. COORDINATE GEOMETRY

- **CONJECTURES IN COORDINATE GEOMETRY**

  - **OH.Math.HSG.GPE.4** *Use coordinates to prove simple geometric theorems algebraically and to verify geometric relationships algebraically, including properties of special triangles, quadrilaterals, and circles.*

12. CONIC SECTIONS

- **CIRCLES**

  - **OH.Math.HSG.GPE.1** *Derive the equation of a circle of given center and radius using the Pythagorean Theorem; complete the square to find the center and radius of a circle given by an equation.*
  - **OH.Math.HSG.GMD.4** *Identify the shapes of two-dimensional cross-sections of three-dimensional objects, and identify three-dimensional objects generated by rotations of two-dimensional objects.*

- PARABOLAS
  - **OH.Math.HSG.GMD.4** *Identify the shapes of two-dimensional cross-sections of three-dimensional objects, and identify three-dimensional objects generated by rotations of two-dimensional objects.*

13. GEOMETRIC TRANSFORMATIONS

- **TRANSFORMATIONS ON THE COORDINATE PLANE**
  - **OH.Math.HSG.GMD.5** *Understand how and when changes to the measures of a figure (lengths or angles) result in similar and non-similar figures.*
  - **OH.Math.HSG.SRT.1a** *A dilation takes a line not passing through the center of the dilation to a parallel line and leaves a line passing through the center unchanged.*
  - **OH.Math.HSG.SRT.1b** *The dilation of a line segment is longer or shorter in the ratio given by the scale factor.*

- **DILATIONS, TRANSLATIONS, ROTATIONS, AND REFLECTIONS**
  - **OH.Math.HSG.GMD.5** *Understand how and when changes to the measures of a figure (lengths or angles) result in similar and non-similar figures.*
  - **OH.Math.HSG.SRT.1a** *A dilation takes a line not passing through the center of the dilation to a parallel line and leaves a line passing through the center unchanged.*
  - **OH.Math.HSG.SRT.1b** *The dilation of a line segment is longer or shorter in the ratio given by the scale factor.*

14. CONGRUENCE AND SIMILARITY

- **TRIANGLES AND CONGRUENCE TRANSFORMATIONS**
  - **OH.Math.HSG.SRT.5** *Use congruence and similarity criteria for triangles to solve problems and to justify relationships in geometric figures that can be decomposed into triangles.*

- **TRIANGLES AND SIMILARITY TRANSFORMATIONS**
  - **OH.Math.HSG.SRT.2** *Given two figures, use the definition of similarity in terms of similarity transformations to decide if they are similar; explain using similarity transformations the meaning of similarity for triangles as the equality of all corresponding pairs of angles and the proportionality of all corresponding pairs of sides.*
  - **OH.Math.HSG.SRT.3** *Use the properties of similarity transformations to establish the AA criterion for two triangles to be similar.*
  - **OH.Math.HSG.SRT.5** *Use congruence and similarity criteria for triangles to solve problems and to justify relationships in geometric figures that can be decomposed into triangles.*
  - **OH.Math.HSG.SRT.4** *Prove and apply theorems about triangles.*

- **SIMILARITY OF OTHER POLYGONS**
  - **OH.Math.HSG.SRT.2** *Given two figures, use the definition of similarity in terms of similarity transformations to decide if they are similar; explain using similarity transformations the meaning of similarity for triangles as the equality of all corresponding pairs of angles and the proportionality of all corresponding pairs of sides.*

15. TRIANGLE THEOREMS

- **TRIANGLE ANGLE THEOREMS**
  - **OH.Math.HSG.SRT.4** *Prove and apply theorems about triangles.*

16. TRIANGLES AND TRIGONOMETRY

- **THE PYTHAGOREAN THEOREM**
  - **OH.Math.HSG.SRT.8a** *Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems if one of the two acute angles and a side length is given.*
  - **OH.Math.HSG.SRT.4** *Prove and apply theorems about triangles.*

- **TRIGONOMETRIC RATIOS**
  - **OH.Math.HSG.SRT.7** *Explain and use the relationship between the sine and cosine of complementary angles.*
  - **OH.Math.HSG.SRT.6** *Understand that by similarity, side ratios in right triangles are properties of the angles in the triangle, leading to definitions of trigonometric ratios for acute angles.*
  - **OH.Math.HSG.SRT.8a** *Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems if one of the two acute angles and a side length is given.*

17. CIRCLES

- **CENTRAL ANGLES, INSCRIBED ANGLES, AND CHORDS**
  - **OH.Math.HSG.C.5a** *Apply similarity to relate the length of an arc intercepted by a central angle to the radius. Use the relationship to solve problems.*

- **CONGRUENT AND SIMILAR CIRCLES**
  - **OH.Math.HSG.C.1** *Prove that all circles are similar using transformational arguments.*

- **CIRCUMFERENCE AND ARC LENGTH**
  - **OH.Math.HSG.GMD.1** *Give an informal argument for the formulas for the circumference of a circle, area of a circle, and volume of a cylinder, pyramid, and cone.*

- **AREA OF CIRCLES AND SECTORS**
  - **OH.Math.HSG.GMD.1** *Give an informal argument for the formulas for the circumference of a circle, area of a circle, and volume of a cylinder, pyramid, and cone.*
  - **OH.Math.HSG.C.5b** *Derive the formula for the area of a sector, and use it to solve problems.*

18. VOLUME

- **VOLUME OF PRISMS AND PYRAMIDS**
  - **OH.Math.HSG.GMD.3** *Use volume formulas for cylinders, pyramids, cones, and spheres to solve problems.*
  - **OH.Math.HSG.MG.1** *Use geometric shapes, their measures, and their properties to describe objects, e.g., modeling a tree trunk or a human torso as a cylinder.*
  - **OH.Math.HSG.GMD.1** *Give an informal argument for the formulas for the circumference of a circle, area of a circle, and volume of a cylinder, pyramid, and cone.*
  - **OH.Math.HSG.GMD.4** *Identify the shapes of two-dimensional cross-sections of three-dimensional objects, and identify three-dimensional objects generated by rotations of two-dimensional objects.*

- **VOLUME OF CYLINDERS AND CONES**
  - **OH.Math.HSG.GMD.3** *Use volume formulas for cylinders, pyramids, cones, and spheres to solve problems.*
  - **OH.Math.HSG.MG.1** *Use geometric shapes, their measures, and their properties to describe objects, e.g., modeling a tree trunk or a human torso as a cylinder.*
  - **OH.Math.HSG.GMD.1** *Give an informal argument for the formulas for the circumference of a circle, area of a circle, and volume of a cylinder, pyramid, and cone.*
  - **OH.Math.HSG.GMD.4** *Identify the shapes of two-dimensional cross-sections of three-dimensional objects, and identify three-dimensional objects generated by rotations of two-dimensional objects.*

- **VOLUME OF COMPOSITE SOLIDS**
  - **OH.Math.HSG.GMD.4** *Identify the shapes of two-dimensional cross-sections of three-dimensional objects, and identify three-dimensional objects generated by rotations of two-dimensional objects.*
  - **OH.Math.HSG.GMD.3** *Use volume formulas for cylinders, pyramids, cones, and spheres to solve problems.*
  - **OH.Math.HSG.GMD.1** *Give an informal argument for the formulas for the circumference of a circle, area of a circle, and volume of a cylinder, pyramid, and cone.*

- **OH.Math.HSG.MG.1** *Use geometric shapes, their measures, and their properties to describe objects, e.g., modeling a tree trunk or a human torso as a cylinder.*
- **OH.Math.HSG.MG.3** *Apply geometric methods to solve design problems, e.g., designing an object or structure to satisfy physical constraints or minimize cost; working with typographic grid systems based on ratios.*

19. PROBABILITY

- **INTRODUCTION TO PROBABILITY**
  - **OH.Math.HSS.CP.2** *Understand that two events A and B are independent if and only if the probability of A and B occurring together is the product of their probabilities, and use this characterization to determine if they are independent.*
  - **OH.Math.HSS.CP.1** *Describe events as subsets of a sample space (the set of outcomes) using characteristics (or categories) of the outcomes, or as unions, intersections, or complements of other events ("or," "and," "not").*
  - **OH.Math.HSS.CP.3** *Understand the conditional probability of A given B as P(A and B)/P(B), and interpret independence of A and B as saying that the conditional probability of A given B is the same as the probability of A, and the conditional probability of B given A is the same as the probability of B.*
  - **OH.Math.HSS.CP.7** *Apply the Addition Rule, P(A or B) = P(A) + P(B) – P(A and B), and interpret the answer in terms of the model.*

- **CONDITIONAL PROBABILITY**
  - **OH.Math.HSS.CP.3** *Understand the conditional probability of A given B as P(A and B)/P(B), and interpret independence of A and B as saying that the conditional probability of A given B is the same as the probability of A, and the conditional probability of B given A is the same as the probability of B.*
  - **OH.Math.HSS.CP.1** *Describe events as subsets of a sample space (the set of outcomes) using characteristics (or categories) of the outcomes, or as unions, intersections, or complements of other events ("or," "and," "not").*
  - **OH.Math.HSS.CP.5** *Recognize and explain the concepts of conditional probability and independence in everyday language and everyday situations.*
  - **OH.Math.HSS.CP.4** *Construct and interpret two-way frequency tables of data when two categories are associated with each object being classified. Use the two-way table as a sample space to decide if events are independent and to approximate conditional probabilities.*
  - **OH.Math.HSS.CP.6** *Find the conditional probability of A given B as the fraction of B's outcomes that also belong to A, and interpret the answer in terms of the model.*

20. TEST-TAKING STRATEGIES

- **STUDY HABITS**

- **BEING PREPARED AND GETTING STARTED**

- **WORDING IN TEST QUESTIONS**

- **WORDING IN ANSWER CHOICES**

- **QUESTIONS WITH PASSAGES AND VISUAL DATA**

- **ESSAY AND SHORT ANSWER QUESTIONS**

- **WORD PROBLEMS**