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. POINTS, LINES, AND ANGLES

- **POINTS, RAYS, LINE SEGMENTS, LINES, AND FIGURES**
  - **OH.Math.HSG.CO.1** *Know precise definitions of ray, angle, circle, perpendicular line, parallel line, and line segment, based on the undefined notions of point, line, distance along a line, and arc length.*

- **PARALLEL AND PERPENDICULAR LINES**
  - **OH.Math.HSG.GPE.5** *Justify the slope criteria for parallel and perpendicular lines, and use them to solve geometric problems, e.g., find the equation of a line parallel or perpendicular to a given line that passes through a given point.*

- **PARALLEL LINES AND ANGLE RELATIONSHIPS**
  - **OH.Math.HSG.CO.9** *Prove and apply theorems about lines and angles.*

- **PERPENDICULAR BISECTOR AND ANGLE BISECTOR THEOREMS**
  - **OH.Math.HSG.CO.9** *Prove and apply theorems about lines and angles.*

2. COORDINATE GEOMETRY

- **SLOPE-INTERCEPT FORM OF A LINEAR EQUATION**
  - **OH.Math.HSG.GPE.5** *Justify the slope criteria for parallel and perpendicular lines, and use them to solve geometric problems, e.g., find the equation of a line parallel or perpendicular to a given line that passes through a given point.*

- **LENGTH AND THE DISTANCE FORMULA**
  - **OH.Math.HSG.GPE.6** *Find the point on a directed line segment between two given points that partitions the segment in a given ratio.*

- **OH.Math.HSG.GPE.7** *Use coordinates to compute perimeters of polygons and areas of triangles and rectangles, e.g., using the distance formula.*

- **MIDPOINT FORMULA ON THE COORDINATE PLANE**
  - **OH.Math.HSG.GPE.6** *Find the point on a directed line segment between two given points that partitions the segment in a given ratio.*

- **CONJECTURES IN COORDINATE GEOMETRY**
  - **OH.Math.HSG.CO.10** *Prove and apply theorems about triangles.*
  - **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.*

3. PERIMETER, AREA, AND TRANSFORMATIONS ON THE COORDINATE PLANE

- **PERIMETER ON THE COORDINATE PLANE**
  - **OH.Math.HSG.GPE.7** *Use coordinates to compute perimeters of polygons and areas of triangles and rectangles, e.g., using the distance formula.*
  - **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.*

- **AREA ON THE COORDINATE PLANE**
  - **OH.Math.HSG.GPE.7** *Use coordinates to compute perimeters of polygons and areas of triangles and rectangles, e.g., using the distance formula.*
  - **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.*

- **TRANSFORMATIONS ON THE COORDINATE PLANE**
  - **OH.Math.HSG.CO.5** *Given a geometric figure and a rotation, reflection, or translation, draw the transformed figure using items such as graph paper, tracing paper, or geometry software. Specify a sequence of transformations that will carry a given figure onto another.*
  - **OH.Math.HSG.CO.2** *Represent transformations in the plane using, e.g., transparencies and geometry software; describe transformations as functions that take points in the plane as inputs and give other points as outputs. Compare transformations that preserve distance and angle to those that do not, e.g., translation versus horizontal stretch.*
  - **OH.Math.HSG.CO.4** *Develop definitions of rotations, reflections, and translations in terms of angles, circles, perpendicular lines, parallel lines, and line segments.*
  - **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.CO.5** *Given a geometric figure and a rotation, reflection, or translation, draw the transformed figure using items such as graph paper, tracing paper, or geometry software. Specify a sequence of transformations that will carry a given figure onto another.*
  - **OH.Math.HSG.CO.2** *Represent transformations in the plane using, e.g., transparencies and geometry software; describe transformations as functions that take points in the plane as inputs and give other points as outputs. Compare transformations that preserve distance and angle to those that do not, e.g., translation versus horizontal stretch.*
  - **OH.Math.HSG.SRT.1b** *The dilation of a line segment is longer or shorter in the ratio given by the scale factor.*

4. TRIANGLES

- **TRIANGLES AND CONGRUENCE TRANSFORMATIONS**
  - **OH.Math.HSG.CO.6** *Use geometric descriptions of rigid motions to transform figures and to predict the effect of a given rigid motion on a given figure; given two figures, use the definition of congruence in terms of rigid motions to decide if they are*

congruent.

- **OH.Math.HSG.CO.7** *Use the definition of congruence in terms of rigid motions to show that two triangles are congruent if and only if corresponding pairs of sides and corresponding pairs of angles are congruent.*
- **OH.Math.HSG.CO.8** *Explain how the criteria for triangle congruence (ASA, SAS, and SSS) follow from the definition of congruence in terms of rigid motions.*

- **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.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.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.3** *Use the properties of similarity transformations to establish the AA criterion for two triangles to be similar.*
  - **OH.Math.HSG.CO.10** *Prove and apply theorems about triangles.*

- **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.CO.10** *Prove and apply theorems about triangles.*
  - **OH.Math.HSG.SRT.4** *Prove and apply theorems about triangles.*

5. CONGRUENCE OF POLYGONS

- **CONGRUENCE OF OTHER POLYGONS**
  - **OH.Math.HSG.CO.5** *Given a geometric figure and a rotation, reflection, or translation, draw the transformed figure using items such as graph paper, tracing paper, or geometry software. Specify a sequence of transformations that will carry a given figure onto another.*
  - **OH.Math.HSG.CO.6** *Use geometric descriptions of rigid motions to transform figures and to predict the effect of a given rigid motion on a given figure; given two figures, use the definition of congruence in terms of rigid motions to decide if they are congruent.*

6. SIMILARITY OF POLYGONS

- **SIMILARITY OF OTHER POLYGONS**
  - **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.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.*

7. PROPERTIES OF TRIANGLES

- **TRIANGLE ANGLE THEOREMS**
  - **OH.Math.HSG.CO.10** *Prove and apply theorems about triangles.*

- **MEDIANS AND ALTITUDES OF TRIANGLES**
  - **OH.Math.HSG.CO.10** *Prove and apply theorems about triangles.*

8. TRIANGLE BISECTORS

- **TRIANGLE BISECTORS**
  - **OH.Math.HSG.CO.10** *Prove and apply theorems about triangles.*
  - **OH.Math.HSG.C.3** *Construct the inscribed and circumscribed circles of a triangle; prove and apply the property that opposite angles are supplementary for a quadrilateral inscribed in a circle.*

9. QUADRILATERALS AND CONSTRUCTIONS

- **PARALLELOGRAMS AND RECTANGLES**
  - **OH.Math.HSG.CO.11** *Prove and apply theorems about parallelograms.*

- **SQUARES AND RHOMBI**
  - **OH.Math.HSG.CO.11** *Prove and apply theorems about parallelograms.*

- **CONSTRUCTIONS**
  - **OH.Math.HSG.CO.13** *Construct an equilateral triangle, a square, and a regular hexagon inscribed in a circle.*
  - **OH.Math.HSG.CO.12** *Make formal geometric constructions with a variety of tools and methods (compass and straightedge, string, reflective devices, paper folding, dynamic geometric software, etc.).*

10. TRIGONOMETRIC RATIOS

- **TRIGONOMETRIC RATIOS**
  - **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.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.*

11. CIRCLES

- **CIRCLE BASICS**
  - **OH.Math.HSG.C.2** *Identify and describe relationships among angles, radii, chords, tangents, and arcs and use them to solve problems.*

- **CENTRAL ANGLES, INSCRIBED ANGLES, AND CHORDS**
  - **OH.Math.HSG.C.2** *Identify and describe relationships among angles, radii, chords, tangents, and arcs and use them to solve problems.*
  - **OH.Math.HSG.C.3** *Construct the inscribed and circumscribed circles of a triangle; prove and apply the property that opposite angles are supplementary for a quadrilateral inscribed in a circle.*

- **SECANTS, ANGLES, AND INTERCEPTED ARCS**
  - **OH.Math.HSG.CO.9** *Prove and apply theorems about lines and angles.*
  - **OH.Math.HSG.C.2** *Identify and describe relationships among angles, radii, chords, tangents, and arcs and use them to solve problems.*

- **TANGENTS, ANGLES, AND INTERCEPTED ARCS**
  - **OH.Math.HSG.CO.9** *Prove and apply theorems about lines and angles.*
  - **OH.Math.HSG.C.2** *Identify and describe relationships among angles, radii, chords, tangents, and arcs and use them to solve problems.*

12. PROPERTIES OF CIRCLES

- **RADIANS AND THE UNIT CIRCLE**
  - **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.*
  - **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.*

- **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.C.5b** *Derive the formula for the area of a sector, and use it 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.*

13. CONGRUENCE, SIMILARITY, AND EQUATIONS OF CIRCLES

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

- **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.*

14. INTRODUCTION TO THREE-DIMENSIONAL SOLIDS

- **RELATING TWO-DIMENSIONAL FIGURES TO THREE-DIMENSIONAL 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.*

- **SURFACE AREA AND VOLUME OF SPHERES**
  - **OH.Math.HSG.GMD.3** *Use volume formulas for cylinders, pyramids, cones, and spheres to solve problems.*

15. VOLUME

- **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.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.*

- **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.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.*

- **VOLUME OF COMPOSITE SOLIDS**
  - **OH.Math.HSG.GMD.3** *Use volume formulas for cylinders, pyramids, cones, and spheres to solve problems.*

16. VOLUME OF SIMILAR SOLIDS

- **VOLUME OF SIMILAR SOLIDS**
  - **OH.Math.HSG.GMD.6** *When figures are similar, understand and apply the fact that when a figure is scaled by a factor of , the effect on lengths, areas, and volumes is that they are multiplied by k, k^2, and k^3, respectively.*

17. SURFACE AREA

- **SURFACE AREA OF COMPOSITE SOLIDS**
  - **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.*

- **SURFACE AREA OF SIMILAR SOLIDS**
  - **OH.Math.HSG.GMD.6** *When figures are similar, understand and apply the fact that when a figure is scaled by a factor of , the effect on lengths, areas, and volumes is that they are multiplied by k, k^2, and k^3, respectively.*

- **MODELING SITUATIONS WITH GEOMETRY**
  - **OH.Math.HSG.MG.2** *Apply concepts of density based on area and volume in modeling situations, e.g., persons per square mile, BTUs per cubic foot.*
  - **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.*

18. PROBABILITY CONCEPTS

- **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.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.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.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.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.*
  - **OH.Math.HSS.CP.5** *Recognize and explain the concepts of conditional probability and independence in everyday language and everyday situations.*

19. 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**