Milestones EOC Tutorials for Georgia are designed specifically for the Georgia Standards of Excellence to prepare students for the Georgia Milestones end-of-course assessments. EOC Categories are at the heart of Milestones 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: Points, Lines, and Angles

- **POINTS, RAYS, LINE SEGMENTS, LINES, AND FIGURES**
  - MGSE9-12.G.CO.1: Experiment with transformations in the plane Know precise definitions of angle, circle, perpendicular line, parallel line, and line segment, based on the undefined notions of point, line, distance along a line, and distance around a circular arc.
- **PERPENDICULAR BISECTOR AND ANGLE BISECTOR THEOREMS**
  - MGSE9-12.G.CO.9: Prove geometric theorems Prove theorems about lines and angles.
- **PARALLEL LINES AND ANGLE RELATIONSHIPS**
  - MGSE9-12.G.CO.9: Prove geometric theorems Prove theorems about lines and angles.

Unit 2: Parallel and Perpendicular Lines

- **PARALLEL AND PERPENDICULAR LINES**

- MGSE9-12.G.GPE.5: Use coordinates to prove simple geometric theorems algebraically Prove 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).

Unit 3: Introduction to Coordinate Geometry

- **SLOPE-INTERCEPT FORM OF A LINEAR EQUATION**
  - MGSE9-12.G.GPE.5: Use coordinates to prove simple geometric theorems algebraically Prove 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**
  - MGSE9-12.G.GPE.6: Use coordinates to prove simple geometric theorems algebraically Find the point on a directed line segment between two given points that partitions the segment in a given ratio.
  - MGSE9-12.G.GPE.7: Use coordinates to prove simple geometric theorems algebraically 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**
  - MGSE9-12.G.GPE.6: Use coordinates to prove simple geometric theorems algebraically Find the point on a directed line segment between two given points that partitions the segment in a given ratio.

Unit 4: Conjectures in Coordinate Geometry

- **CONJECTURES IN COORDINATE GEOMETRY**
  - MGSE9-12.G.GPE.4: Use coordinates to prove simple geometric theorems algebraically Use coordinates to prove simple geometric theorems algebraically.
  - MGSE9-12.G.CO.10: Prove geometric theorems Prove theorems about triangles.

Unit 5: Coordinate Geometry

- **PERIMETER ON THE COORDINATE PLANE**
  - MGSE9-12.G.GPE.7: Use coordinates to prove simple geometric theorems algebraically Use coordinates to compute perimeters of polygons and areas of triangles and rectangles, e.g., using the distance formula.
  - MGSE9-12.G.MG.1: Apply geometric concepts in modeling situations 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**
  - MGSE9-12.G.GPE.7: Use coordinates to prove simple geometric theorems algebraically Use coordinates to compute perimeters of polygons and areas of triangles and rectangles, e.g.,

using the distance formula.

- MGSE9-12.G.MG.1: Apply geometric concepts in modeling situations Use geometric shapes, their measures, and their properties to describe objects (e.g., modeling a tree trunk or a human torso as a cylinder).

Unit 6: Transformations on the Plane

- **TRANSFORMATIONS ON THE COORDINATE PLANE**
  - MGSE9-12.G.CO.2: Experiment with transformations in the plane 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).
  - MGSE9-12.G.CO.5: Experiment with transformations in the plane Given a geometric figure and a rotation, reflection, or translation, draw the transformed figure using e.g., graph paper, tracing paper, or geometry software. Specify a sequence of transformations that will carry a given figure onto another.
  - MGSE9-12.G.CO.4: Experiment with transformations in the plane Develop definitions of rotations, reflections, and translations in terms of angles, circles, perpendicular lines, parallel lines, and line segments.
  - MGSE9-12.G.SRT.1a: Understand similarity in terms of similarity transformations Verify experimentally the properties of dilations given by a center and a scale factor. The dilation of a line not passing through the center of the dilation results in a parallel line and leaves a line passing through the center unchanged.
  - MGSE9-12.G.SRT.1b: Understand similarity in terms of similarity transformations Verify experimentally the properties of dilations given by a center and a scale factor. The dilation of a line segment is longer or shorter according to the ratio given by the scale factor.
- **DILATIONS, TRANSLATIONS, ROTATIONS, AND REFLECTIONS**
  - MGSE9-12.G.CO.3: Experiment with transformations in the plane Given a rectangle, parallelogram, trapezoid, or regular polygon, describe the rotations and reflections that carry it onto itself.
  - MGSE9-12.G.CO.5: Experiment with transformations in the plane Given a geometric figure and a rotation, reflection, or translation, draw the transformed figure using e.g., graph paper, tracing paper, or geometry software. Specify a sequence of transformations that will carry a given figure onto another.
  - MGSE9-12.G.CO.2: Experiment with transformations in the plane 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).

Unit 7: Triangles and Transformations

- **TRIANGLES AND CONGRUENCE TRANSFORMATIONS**
  - MGSE9-12.G.SRT.5: Prove theorems involving similarity Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures.
  - MGSE9-12.G.CO.6: Understand congruence in terms of rigid motions 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.
  - MGSE9-12.G.CO.7: Understand congruence in terms of rigid motions 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.
  - MGSE9-12.G.CO.8: Understand congruence in terms of rigid motions 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**
  - MGSE9-12.G.SRT.2: Understand similarity in terms of similarity transformations 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.
  - MGSE9-12.G.SRT.3: Understand similarity in terms of similarity transformations Use the properties of similarity transformations to establish the AA criterion for two triangles to be similar.
  - MGSE9-12.G.SRT.5: Prove theorems involving similarity Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures.
  - MGSE9-12.G.CO.10: Prove geometric theorems Prove theorems about triangles.
  - MGSE9-12.G.SRT.4: Prove theorems involving similarity Prove theorems about triangles.

Unit 8: Congruence and Similarity of Other Polygons

- **CONGRUENCE OF OTHER POLYGONS**
  - MGSE9-12.G.CO.6: Understand congruence in terms of rigid motions 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.
  - MGSE9-12.G.CO.3: Experiment with transformations in the plane Given a rectangle, parallelogram, trapezoid, or regular polygon, describe the rotations and reflections that carry it onto itself.

- MGSE9-12.G.CO.5: Experiment with transformations in the plane Given a geometric figure and a rotation, reflection, or translation, draw the transformed figure using e.g., graph paper, tracing paper, or geometry software. Specify a sequence of transformations that will carry a given figure onto another.

- **SIMILARITY OF OTHER POLYGONS**
  - MGSE9-12.G.SRT.2: Understand similarity in terms of similarity transformations 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.

Unit 9: Triangles

- **TRIANGLE ANGLE THEOREMS**
  - MGSE9-12.G.CO.10: Prove geometric theorems Prove theorems about triangles.
- **MEDIANS AND ALTITUDES OF TRIANGLES**
  - MGSE9-12.G.CO.10: Prove geometric theorems Prove theorems about triangles.

Unit 10: Triangle Bisectors and Constructions

- **TRIANGLE BISECTORS**
  - MGSE9-12.G.CO.10: Prove geometric theorems Prove theorems about triangles.
- **CONSTRUCTIONS**
  - MGSE9-12.G.CO.12: Make geometric constructions Make formal geometric constructions with a variety of tools and methods (compass and straightedge, string, reflective devices, paper folding, dynamic geometric software, etc.).
  - MGSE9-12.G.CO.13: Make geometric constructions Construct an equilateral triangle, a square, and a regular hexagon, each inscribed in a circle.
  - MGSE9-12.G.C.4: Understand and apply theorems about circles Construct a tangent line from a point outside a given circle to the circle.

Unit 11: Quadrilaterals

- **PARALLELOGRAMS AND RECTANGLES**
  - MGSE9-12.G.CO.11: Prove geometric theorems Prove theorems about parallelograms.
- **SQUARES AND RHOMBI**
  - MGSE9-12.G.CO.11: Prove geometric theorems Prove theorems about parallelograms.

Unit 12: Pythagorean Theorem

- **PYTHAGOREAN THEOREM**
  - MGSE9-12.G.SRT.8: Define trigonometric ratios and solve problems involving right triangles Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied

problems.

- MGSE9-12.G.CO.10: Prove geometric theorems Prove theorems about triangles.
- MGSE9-12.G.SRT.4: Prove theorems involving similarity Prove theorems about triangles.

Unit 13: Triangles and Trigonometry

- **TRIGONOMETRIC RATIOS**
  - MGSE9-12.G.SRT.7: Define trigonometric ratios and solve problems involving right triangles Explain and use the relationship between the sine and cosine of complementary angles.
  - MGSE9-12.G.SRT.6: Define trigonometric ratios and solve problems involving right triangles 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.
  - MGSE9-12.G.SRT.8: Define trigonometric ratios and solve problems involving right triangles Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems.
- **LAWS OF SINE AND COSINE**
  - MGSE9-12.G.SRT.8: Define trigonometric ratios and solve problems involving right triangles Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems.

Unit 14: Radians and the Unit Circle

- **RADIANS AND THE UNIT CIRCLE**
  - MGSE9-12.G.C.5: Find arc lengths and areas of sectors of circles Derive using similarity the fact that the length of the arc intercepted by an angle is proportional to the radius, and define the radian measure of the angle as the constant of proportionality; derive the formula for the area of a sector.

Unit 15: Circles

- **CIRCLE BASICS**
  - MGSE9-12.G.C.2: Understand and apply theorems about circles Identify and describe relationships among inscribed angles, radii, chords, tangents, and secants. Include the relationship between central, inscribed, and circumscribed angles; inscribed angles on a diameter are right angles; the radius of a circle is perpendicular to the tangent where the radius intersects the circle.
- **CONGRUENT AND SIMILAR CIRCLES**
  - MGSE9-12.G.C.1: Understand and apply theorems about circles Understand that all circles are similar.
- **CIRCLES**
  - MGSE9-12.G.GPE.1: Translate between the geometric description and the equation for a conic section 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.

Unit 16: Circles and Angles

- **CENTRAL ANGLES, INSCRIBED ANGLES, AND CHORDS**
  - MGSE9-12.G.C.2: Understand and apply theorems about circles Identify and describe relationships among inscribed angles, radii, chords, tangents, and secants. Include the relationship between central, inscribed, and circumscribed angles; inscribed angles on a diameter are right angles; the radius of a circle is perpendicular to the tangent where the radius intersects the circle.
  - MGSE9-12.G.CO.9: Prove geometric theorems Prove theorems about lines and angles.
  - MGSE9-12.G.C.3: Understand and apply theorems about circles Construct the inscribed and circumscribed circles of a triangle, and prove properties of angles for a quadrilateral inscribed in a circle.
- **SECANTS, ANGLES, AND INTERCEPTED ARCS**
  - MGSE9-12.G.CO.9: Prove geometric theorems Prove theorems about lines and angles.
  - MGSE9-12.G.C.2: Understand and apply theorems about circles Identify and describe relationships among inscribed angles, radii, chords, tangents, and secants. Include the relationship between central, inscribed, and circumscribed angles; inscribed angles on a diameter are right angles; the radius of a circle is perpendicular to the tangent where the radius intersects the circle.
- **TANGENTS, ANGLES, AND INTERCEPTED ARCS**
  - MGSE9-12.G.CO.9: Prove geometric theorems Prove theorems about lines and angles.
  - MGSE9-12.G.C.2: Understand and apply theorems about circles Identify and describe relationships among inscribed angles, radii, chords, tangents, and secants. Include the relationship between central, inscribed, and circumscribed angles; inscribed angles on a diameter are right angles; the radius of a circle is perpendicular to the tangent where the radius intersects the circle.

Unit 17: Circumference and Arc Length

- **CIRCUMFERENCE AND ARC LENGTH**
  - MGSE9-12.G.GMD.1a: Explain volume formulas and use them to solve problems Give informal arguments for geometric formulas. Give informal arguments for the formulas of the circumference of a circle and area of a circle using dissection arguments and informal limit arguments.
  - MGSE9-12.G.GMD.1b: Explain volume formulas and use them to solve problems Give informal arguments for geometric formulas. Give informal arguments for the formula of the volume of a cylinder, pyramid, and cone using Cavalieris principle.

Unit 18: Area of Circles and Sectors

- **AREA OF CIRCLES AND SECTORS**

- MGSE9-12.G.GMD.1a: Explain volume formulas and use them to solve problems Give informal arguments for geometric formulas. Give informal arguments for the formulas of the circumference of a circle and area of a circle using dissection arguments and informal limit arguments.
- MGSE9-12.G.GMD.1b: Explain volume formulas and use them to solve problems Give informal arguments for geometric formulas. Give informal arguments for the formula of the volume of a cylinder, pyramid, and cone using Cavalieris principle.
- MGSE9-12.G.C.5: Find arc lengths and areas of sectors of circles Derive using similarity the fact that the length of the arc intercepted by an angle is proportional to the radius, and define the radian measure of the angle as the constant of proportionality; derive the formula for the area of a sector.

Unit 19: Surface Area

- **SURFACE AREA OF COMPOSITE SOLIDS**
  - MGSE9-12.G.MG.1: Apply geometric concepts in modeling situations 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**
  - MGSE9-12.G.MG.1: Apply geometric concepts in modeling situations 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 AND VOLUME OF SPHERES**
  - MGSE9-12.G.GMD.2: Explain volume formulas and use them to solve problems Give an informal argument using Cavalieris principle for the formulas for the volume of a sphere and other solid figures.
  - MGSE9-12.G.GMD.4: Visualize relationships between two-dimensional and three-dimensional objects Identify the shapes of two-dimensional cross-sections of three-dimensional objects, and identify three-dimensional objects generated by rotations of two-dimensional objects.

Unit 20: Volume

- **RELATING TWO-DIMENSIONAL FIGURES TO THREE-DIMENSIONAL SOLIDS**
  - MGSE9-12.G.GMD.4: Visualize relationships between two-dimensional and three-dimensional objects 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 PRISMS AND PYRAMIDS**
  - MGSE9-12.G.GMD.3: Explain volume formulas and use them to solve problems Use volume formulas for cylinders, pyramids, cones, and spheres to solve problems.
  - MGSE9-12.G.GMD.1a: Explain volume formulas and use them to solve problems Give informal arguments for geometric formulas. Give informal arguments for the formulas of the

circumference of a circle and area of a circle using dissection arguments and informal limit arguments.

- MGSE9-12.G.GMD.1b: Explain volume formulas and use them to solve problems Give informal arguments for geometric formulas. Give informal arguments for the formula of the volume of a cylinder, pyramid, and cone using Cavalieris principle.

- **VOLUME OF CYLINDERS AND CONES**
  - MGSE9-12.G.GMD.3: Explain volume formulas and use them to solve problems Use volume formulas for cylinders, pyramids, cones, and spheres to solve problems.
  - MGSE9-12.G.GMD.1a: Explain volume formulas and use them to solve problems Give informal arguments for geometric formulas. Give informal arguments for the formulas of the circumference of a circle and area of a circle using dissection arguments and informal limit arguments.
  - MGSE9-12.G.GMD.1b: Explain volume formulas and use them to solve problems Give informal arguments for geometric formulas. Give informal arguments for the formula of the volume of a cylinder, pyramid, and cone using Cavalieris principle.

Unit 21: Volume of Similar and Composite Solids

- **MODELING SITUATIONS WITH GEOMETRY**
  - MGSE9-12.G.MG.2: Apply geometric concepts in modeling situations Apply concepts of density based on area and volume in modeling situations (e.g., persons per square mile, BTUs per cubic foot).
  - MGSE9-12.G.MG.3: Apply geometric concepts in modeling situations 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).
- **VOLUME OF SIMILAR SOLIDS**
  - MGSE9-12.G.MG.1: Apply geometric concepts in modeling situations Use geometric shapes, their measures, and their properties to describe objects (e.g., modeling a tree trunk or a human torso as a cylinder).
- **VOLUME OF COMPOSITE SOLIDS**
  - MGSE9-12.G.GMD.3: Explain volume formulas and use them to solve problems Use volume formulas for cylinders, pyramids, cones, and spheres to solve problems.

Unit 22: Probability

- **INTRODUCTION TO PROBABILITY**
  - MGSE9-12.S.CP.2: Understand independence and conditional probability and use them to interpret data Understand that if two events and are independent, the probability of and occurring together is the product of their probabilities, and that if the probability of two events and occurring together is the product of their probabilities, the two events are independent.

- MGSE9-12.S.CP.7: Use the rules of probability to compute probabilities of compound events in a uniform probability model Apply the Addition Rule, ( ) = () + () ( ), and interpret the answers in context.

- **GEOMETRIC PROBABILITIES**
  - MGSE9-12.S.CP.1: Understand independence and conditional probability and use them to interpret data Describe categories of events as subsets of a sample space using unions, intersections, or complements of other events (or, and, not).
- **CONDITIONAL PROBABILITY**
  - MGSE9-12.S.CP.6: Use the rules of probability to compute probabilities of compound events in a uniform probability model Find the conditional probability of given as the fraction of s outcomes that also belong to , and interpret the answer in context.
  - MGSE9-12.S.CP.3: Understand independence and conditional probability and use them to interpret data Understand the conditional probability of given as ( )/(). Interpret independence of and in terms of conditional probability; that is, the conditional probability of given is the same as the probability of , and the conditional probability of given is the same as the probability of .
  - MGSE9-12.S.CP.5: Understand independence and conditional probability and use them to interpret data Recognize and explain the concepts of conditional probability and independence in everyday language and everyday situations.
  - MGSE9-12.S.CP.4: Understand independence and conditional probability and use them to interpret data 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.

Unit 23: 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**