Mathematic Curriculum Map Overview

Topic	Skills	Approximate Days of Study
Module 1	• Draw triangles based on given measurements • Know precise definition of angle, circle, perpendicular and parallel lines, and line segments • Identify translations, reflections and rotations as rigid motion • Describe the rotations and reflections that carry it on to itself given a rectangle, parallelogram, trapezoid, or regular polygon, • Apply a rigid motion to informally show that two triangles are congruent • Explain how the criteria for triangle congruence (ASA, SAS, SSS) follow the definition of congruence in terms of rigid motion •Build upon a foundation of congruent triangles to develop formal proof techniques •Make conjectures and construct viable arguments to prove theorems using a variety of formats •Solve problems about triangles, quadrilaterals and other polygons •Perform basic constructions such as copying a segment, bisect an angle, perpendicular bisector and parallel lines •Construct figures (equilateral triangle, square, and a regular hexagon inscribed in a circle) by manipulating appropriate geometric tools (protractor, compass, etc.) •Justify why written instructions produce a desired figure • Compare transformations that preserve distance and angle to those that do not •Draw the transformed figure using graph paper, tracing paper, or geometric software given a geometric figure and a rotation, reflection or translation •Prove theorems about parallel lines and angles •Prove theorems about triangles •Prove theorems about parallelograms	45 days
Module 2	• Use prior knowledge of dilations and proportional reasoning to build a formal understanding of similarity • Identify criteria for similarity of triangles • Make sense of and persevere in solving similarity problems • Apply similarity to right triangles to prove the Pythagorean Theorem • Apply the trigonometric ratios to find missing measurements of general (not necessarily right) triangles • Model and make sense of indirect measurement problems • Model and make sense of geometric problems that involve ratios or rates • Verify properties of dilations given by a center and a scale factor • Use the properties of similarity transformations to establish the AA criterion for two triangles to be similar • Prove that a line parallel to one side of a triangle divides the other two sides proportionally (and conversely) • Explain and use the relationship between sine and cosine of complementary angles	45 days
Module 3	• Extend previous knowledge of the use of the circumference formula • Extend previous knowledge of the use of the area formulas • Extend previous knowledge of the use of the volume formulas • Apply knowledge of two dimensional shapes to be able to identify a cross section of a 3D object • Apply knowledge of two dimensional shapes to be able to identify what 3D object will be formed when rotated about a line • Reason abstractly and quantitatively to model problems using volume formulas • Use the volume formula for cylinders, pyramids, cones and spheres to solve problems	16 days
Module 4	• Use the Pythagorean Theorem to derive the distance formula • Use of distance, midpoint and slope formula to prove properties of special triangles and quadrilaterals • Prove the slope criteria for parallel and perpendicular lines and use them to solve geometric problems • Connect the geometric and algebraic definitions of parabolas • Find the point on a directed line segment between two points that partitions the segment into a given ratio • Use coordinates to compute perimeters of polygons and area of triangles and rectangles • Use coordinates to prove simple geometric theorems algebraically	25 days
Module 5	• Prove all circles are similar • Identify and describe relationships among inscribed angles, central angles, radii and chords • Prove that an inscribed angle on a diameter is a right angle • Prove that the radius of a circle is perpendicular to the tangent where the radius intersects the circle • Construct an inscribed circle of a triangle • Construct a circumscribed circle of a triangle • Prove properties of angles for a quadrilateral inscribed in a circle • Derive, using similarity, that the length of the arc intercepted by an angle is proportional to the radius • Define measure of an angle as the constant of proportionality • Derive the formula for the area of a sector • Derive the equation of a circle given the center and the radius using the Pythagorean Theorem • Complete the square to find the center and radius of a circle given by an equation • Use coordinates to prove simple geometric theorems algebraically • Use geometric shapes, their measures and their properties to describe objects (example: modeling a tree trunk or a human torso as a cylinder)	25 days
EOY Review	• Review of essential content and skills from the year.	20 days