

Geometry (#0597)

Description: This course will study some of the major geometry topics but is not a complete geometry course. Various geometric shapes and their properties will be explored with an emphasis on using geometric models to solve real world problems. Students will also learn to present convincing arguments through a variety of logical means.

Credits: 1

Prerequisites: Algebra 1A (#0595) and Algebra 1B (#0569)

Textbook/Resources: Larson, R. and Boswell, *Big Ideas Math Geometry*. Big Ideas Learning, 2015. (ISBN 9781608408399)

Required Assessments:

Board Approved:8/18/16

AASD Mathematics Goals for K-12 Students

- Become mathematical problem solvers.
- Learn to reason mathematically.
- Learn to communicate mathematically.
- Make mathematical connections.
- Develop conceptual understanding of mathematics.
- Develop procedural fluency.
- Learn to use technology app

AASD Mathematics Standards for Students in Algebra Mathematical Practice Standards

1. Make Sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

	Essential Learning Objective (big Rocks) Domain	Performance Indicators	Assessment
7.G.A.	7. G.A Draw, construct, and describe geometrical figures and describe the relationships between them.	<p><u>7.G.A.1 Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.</u></p> <p><u>7. G.A.2 Draw (freehand, with ruler and protractor, and with technology) geometric shapes with given conditions. Focus on constructing triangles from three measures of angles or sides, noticing when the conditions determine a unique triangle, more than one triangle, or no triangle.</u></p> <p><u>7. G.A.3 Describe the two-dimensional figures that result from slicing three-dimensional figures, as in plane sections of right rectangular prisms and right rectangular pyramids.</u></p>	Rubrics

<p>7.G.B.</p>	<p>7. G.B Solve real-life and mathematical problems involving angle measure, area, surface area, and volume.</p>	<p><u>7. G.B.4 Know the formulas for the area and circumference of a circle and use them to solve problems; give an informal derivation of the relationship between the circumference and area of a circle.</u></p> <p><u>7. G.B.5 Use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and solve simple equations for an unknown angle in a figure.</u></p> <p><u>7.G.B.6 Solve real-world and mathematical problems involving area, volume and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms.</u></p>	<p>Rubrics</p>
<p>8.G.B.</p>	<p>8. G.B Understand and apply the Pythagorean Theorem.</p>	<p><u>8. G.B.6 Explain a proof of the Pythagorean Theorem and its converse.</u></p> <p><u>8. G.B.7 Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions.</u></p> <p><u>8. G.B.8 Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.</u></p>	<p>Rubrics</p>

8.G.C.	8.G.C. Solve real-world and mathematical problems involving volume of cylinders and spheres	8.G.C.9 Know the formulas for the volumes of cylinders, and spheres and use them to solve real-world and mathematical problems.	Rubrics
G.C.O.	G-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.)	G.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.). Copying a segment; copying an angle; bisecting a segment; bisecting an angle; constructing perpendicular lines, including the perpendicular bisector of a line segment; and constructing a line parallel to a given line through a point not on the line. 6,7,and 8	Rubrics
G.SRT	Define trigonometric ratios and solve problems involving right triangles	G.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.	Rubrics

		<p><u>G-SRT.7</u> Explain and use the relationship between the sine and cosine of complementary angles.</p> <p><u>G-SRT.8</u> Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems.</p>	
G.C.	Find arc lengths and areas of sectors of circles	<u>G.C.5</u> 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.	Rubrics
G.GPE	Use coordinates to prove simple geometric theorems algebraically	<u>G-GPE.7</u> Use coordinates to compute perimeters of polygons and areas of triangles and rectangles, e.g., using the distance formula.	Rubrics
G.GMD	Explain volume formulas and use them to solve problems	<u>G.GMD.1</u> Give an informal argument for the formulas for the circumference of a circle, area of a circle, volume of a cylinder, pyramid, and cone. Use	Rubrics

		<p><u>dissection arguments, Cavalieri's principle, and informal limit arguments.</u></p> <p><u>G.GMD.3</u> <u>Use volume formulas for cylinders, pyramids, cones and spheres to solve problems.</u></p> <p>cylinders and spheres are important</p>	
G.MG	Apply Geometric Concepts in modeling situations	<p><u>G.MG.1</u> <u>Use geometric shapes, their measures, and their properties to describe objects (e.g., modeling a tree trunk or a human torso as a cylinder).</u></p> <p><u>G.MG.2</u> <u>Apply concepts of density based on area and volume in modeling situations (e.g., persons per square mile, BTUs per cubic foot).</u></p> <p><u>G-MG.3</u> <u>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).</u></p>	Rubrics