

South Amherst Middle School Grade 7 Mathematics

Unit 8: Geometric Measurement

Time: Approximate time frame 6-8 weeks

Standard(s):

Draw, Construct, and describe geometrical figures and describe the relationships between them.

7.G.1 Solve problems involving scale drawing of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing in a different scale.

7.G.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.

7.G.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.

Solve real-life and mathematical problems involving angle measure, area, surface area, and volume

7.G.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.

7.G.5 Use facts about supplementary, complementary, vertical, and adjacent angles in multi-step problem to write and solve simple equations for an unknown angle in a figure.

7.G.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.

Big Ideas: *Students will understand that ...*

- Real world and geometric structures are composed of shapes and spaces with specific properties.
- Shapes are defined by their properties.
- Shapes have a purpose for designing structures.
- Three-dimensional figures have relationships to specific two-dimensional figures.

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- Planes that cut polyhedra create related two-dimensional figures.

Essential Questions:

- How are forms and objects created or represented?
- How are two-dimensional and three-dimensional space related?
- How are specific characteristics and a classification system useful in analyzing and designing structures?
- How does our understanding of geometry help us to describe real-world objects?

Prerequisite Skills:

Students should already be able to:

- Solve problems involving surface area of figures composed of triangles and rectangles.
- Solve problems involving volume of right rectangular prisms.
- Represent three-dimensional figures using nets.
- Find area of quadrilaterals and triangles, and of other polygons through decomposition strategies.

Skills: Students will be able to ...

- Use freehand, ruler, protractor and technology to draw geometric shapes with given conditions. (7.G.2)
- Construct triangles from 3 measures of angles or sides. (7.G.2)
- Given conditions, determine what and how many type(s) of triangles are possible to construct. (7.G.2)
- Describe the two-dimensional figures that result from slicing three-dimensional figures (right rectangular prisms and right rectangular pyramids). (7.G.3)
- Identify and describe supplementary, complementary, vertical, and adjacent angles. (7.G.5)

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- Use understandings of supplementary, complementary, vertical and adjacent angles to write and solve equations. (7.G.5)
- Explain (verbally and in writing) the relationships between the angles formed by two intersecting lines. (7.G.5)
- Solve mathematical problems involving area, volume and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms. (7.G.6)
- Solve real-world problems involving area, volume and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms. (7.G.6)

Vocabulary: Three-dimensional, Two-dimensional, Surface area, volume, Intersecting lines, Vertex, Complementary angles, Supplementary angles, Cross-sections, Right rectangular prism, Right rectangular pyramid, Constructions, Virtual manipulative, Cube, Planar section, Compose, Decompose, Nets, Volume, Area, Polygon, Pyramid, Prism, Triangle, Angle, Right angle, Obtuse angle, Degrees, Acute angle, Angle measure, Line segment, Plane

Resources:

Textbook, ODE, Online Programs, Collaboration with Colleagues

Assessments:

- **Formative:** Exit cards, bell ringers, homework practice, observations, in-class practice, student self-reflection.
- **Summative:** Assessments, Quizzes, Projects