Unit 7 - Measurement, Area, Volume, Angle Relationships

Content Area: **Mathematics**
Course(s): **Pre-Algebra 6**
Time Period: **March**
Length: **5 weeks**
Status: **Published**

Transfer

Big Idea: Geometry

Enduring Understandings

Area, surface area, and volume can be used to solve real-world and mathematical problems.

Geometric shapes can be drawn using a variety of tools to meet given conditions.

Geometric formulas can be used to solve mathematical problems for two and three dimensional figures.

Essential Questions

Is geometry more like map-making and using a map, or inventing and playing games like chess?

How can we solve real-world problems involving area, surface area, and volume?

How can I put shapes together and take them apart to form other shapes?

Critical Knowledge and Skillls

Vocabulary

Vocabulary

Right Triangles

Leg

Hypotenuse

Quadrilateral

Rhombus

Square

Rectangle

Area

Diagonal

Polygons

Volume

Edge

Surface Area

Lateral Area

Prism

Learning Objectives

Apply the area of a triangle and rectangle to find the area of other polygons.

Find the volume of a right rectangular prism with fractional edge lengths using unit cubes.

Draw and identify a polygon on a coordinate plane given the coordinates of the vertices

Represent three-dimensional figures using nets made up of rectangles and triangles, and use the nets to find the surface area.

Classify triangles and polygons

Find areas of parallelograms and trapezoids

Find circumferences and areas of circles.

Find surface areas and volumes of solids.

Resources

Standards

MA.K-12.5	Use appropriate tools strategically. Mathematically proficient students consider the available tools when solving a mathematical problem. These tools might include pencil and paper, concrete models, a ruler, a protractor, a calculator, a spreadsheet, a computer algebra system, a statistical package, or dynamic geometry software. Proficient students are sufficiently familiar with tools appropriate for their grade or course to make sound decisions about when each of these tools might be helpful, recognizing both the insight to be gained and their limitations. For example, mathematically proficient high school students analyze graphs of functions and solutions generated using a graphing calculator. They detect possible errors by strategically using estimation and other mathematical knowledge. When making mathematical models, they know that technology can enable them to visualize the results of varying assumptions, explore consequences, and compare predictions with data. Mathematically proficient students at various grade levels are able to identify relevant external mathematical resources, such as digital content located on a website, and use them to pose or solve problems. They are able to use technological tools to explore and deepen their understanding of concepts.
MA.7.G.A	Draw, construct, and describe geometrical figures and describe the relationships between them.
MA.7.G.A.2	Draw (with technology, with ruler and protractor, as well as freehand) 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.
MA.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.
MA.7.G.B	Solve real-life and mathematical problems involving angle measure, area, surface area, and volume.

MA.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.
MA.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.
MA.6.G.A	Solve real-world and mathematical problems involving area, surface area, and volume.
MA.6.G.A.1	Find the area of right triangles, other triangles, special quadrilaterals, and polygons by composing into rectangles or decomposing into triangles and other shapes; apply these techniques in the context of solving real-world and mathematical problems.
MA.6.G.A.2	Find the volume of a right rectangular prism with fractional edge lengths by packing it with unit cubes of the appropriate unit fraction edge lengths, and show that the volume is the same as would be found by multiplying the edge lengths of the prism. Apply the formulas $V = lwh$ and $V = Bh$ to find volumes of right rectangular prisms with fractional edge lengths in the context of solving real-world and mathematical problems.
MA.6.G.A.3	Draw polygons in the coordinate plane given coordinates for the vertices; use coordinates to find the length of a side joining points with the same first coordinate or the same second coordinate. Apply these techniques in the context of solving real-world and mathematical problems.
MA.6.G.A.4	Represent three-dimensional figures using nets made up of rectangles and triangles, and use the nets to find the surface area of these figures. Apply these techniques in the context of solving real-world and mathematical problems.