Unit: Topic 7 - Solve Area, Surface Area, and Volume Problems

State Standard:
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.
6.G.A.1 Find the area of right triangles, other triangles, special quadrilaterals, and polygons by composing into rectangles or decomposing into triangles or other shapes.
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 of the prism. Apply the formulas V=lwh and V=bh to find volumes of right rectangular prisms with fractional edge lengths in context.
6.G.A.3 Draw polygons in the coordinate plane given coordinates for the vertices; use coordinates to find the length of a side

Coherence and Prerequisite Skills

Comprehensive information can be found in ***EnVision TE***: p. Topic 7-**394C**-Topic Overview

- Surface Area and Volume definitions
- Formulas for the area of triangles, parallelograms (rectangles)
- Irregular figures are often composed of shapes you know how to find the area of
- Nets are 2D representations of 3D figures
- Surface area is the total area of all faces of a 3D solid, expressed in units squared
- Volume is the amount of space inside of a 3D solid, expressed in units cubed.
- Prisms and pyramids are named by the shape of their base
- Calculate the area of polygons; either by using formulas or by breaking down the figure into triangles and parallelograms
- Calculate the surface area of pyramids and prisms by finding the area of all sides
- Calculate the volume of rectangular prisms with fractional sides.
- Draw polygons on the coordinate plane with given vertices
- Draw nets or identify nets that represent a given 3D figure

Academic Vocabulary and Notations

base, edge, face, net, vertex (vertices), height, surface area, volume, prism, pyramid, triangle, trapezoid, parallelogram, dimensions, quadrilateral

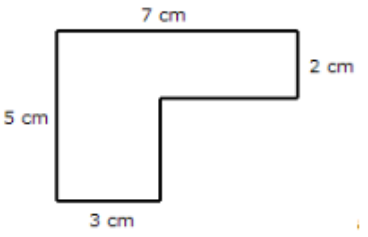
Essential Learning Standards
(in student friendly language - I can…)

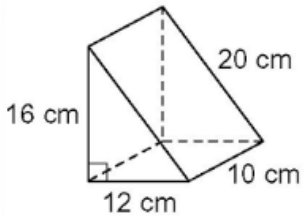
- I can use what I know about areas of rectangles to find the areas of parallelograms.
- I can find the areas of triangles.
- I can find areas of other figures composed of parallelograms and triangles
- I can find the areas of polygons
- I can represent solid figures using nets.
- I can draw a net of a prism and use it to find the prism's surface area.
- I can draw a net of a pyramid and use it to find the pyramid's surface area.
- I can find the volume of a rectangular prism with fractional edge lengths.
- I can draw polygons on a coordinate plane and find the missing side.
- I can use coordinates of a polygon to find the length of a missing side.

Proficiency Level of Understanding	
4 Advanced	● Find the surface area of a three dimensional shape composed of polygons ● Find the volume of a compound figure composed of right rectangular prisms to solve problems
3 Proficient	● Find surface areas of three-dimensional shapes composed of rectangles and triangles (Triangular and rectangular prisms, triangular and rectangular pyramids with regular polygons for a base) ● Calculate areas of polygons and special quadrilaterals and triangles ● Find the volume of right rectangular prisms with all sides expressed as a fraction or a mixed number ● Find the missing side length of a rectangular prism given the volume and the two other side lengths ● Draw polygons in the four- quadrant coordinate plane with scales in various integer increments, given integer-valued coordinates for the vertices
2 Partial	● Calculate areas of parallelograms and any triangles ● Draw polygons in the four-quadrant coordinate plane with scales in one-unit increments, given integer-valued coordinates for the vertices; ● Find the volume of right rectangular prisms with one side expressed as a fraction or a mixed number
1 Minimal	● Find areas of right triangles and rectangles. ● Draw polygons with positive coordinates on a grid with a scale in one-unit increments, given nonnegative integer-valued coordinates for the vertices; ● Find the volume of right rectangular prisms with one side expressed as a fraction or a mixed number in halves or fourths.

Exemplar Tasks to Meet Standard

Task 1: Calculate the area of the figure.
Task 2: Calculate the total surface area of the triangular prism.





Task 3: Calculate the volume of the rectangular prism