

Unit B - 2D and 3D Geometry

Overview

During this Geometry unit students move from finding area and perimeter of two dimensional shapes to finding the surface area and volume of three dimensional shapes. Although finding the area of some of the shapes is a review, finding the area and circumference of circles is new for the students. Students should not be given formulas for finding surface area but instead should find surface area based on the nets of these shapes. When working with volume of prisms the emphasis should be on thinking of volume as the area of the base times the height of the prism to generalize for any prism. The concepts of area and volume are used in applications throughout the unit.

21st Century Capacities: Analyzing, Synthesizing

Stage 1 - Desired Results

ESTABLISHED GOALS/ STANDARDS

MP 1 Make sense sense of problems and persevere in solving them

MP4 Model with Mathematics

MP5 Use appropriate tools strategically

MP6 Attend to precision

MP7 Look for and make use of structure

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

CC.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

Transfer:

Students will be able to independently use their learning in new situations to...

1. Make sense of a problem, initiate a plan, execute it, and evaluate the reasonableness of the solution. (analyzing)
2. Apply familiar mathematical concepts to a new problem or apply a new concept to rework a familiar problem. (synthesising)
3. Justify reasoning using clear and appropriate mathematical language.

Meaning:

UNDERSTANDINGS: Students will understand that:

1. Mathematicians use geometric models, and spatial sense to interpret and make sense of the physical environment.
2. Mathematicians analyze characteristics and properties of geometric shapes to develop

ESSENTIAL QUESTIONS: Students will explore & address these recurring questions:

- A. What do you see?
- B. How are 2D and 3D shapes similar?
- C. What have I seen in the past that can help me now?

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triangle, more than one triangle, or no triangle. CC.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. CC.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. CC.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.	mathematical arguments about geometric relationships. - Mathematicians flexibly use different tools, strategies, and operations to build conceptual knowledge or solve problems. - Mathematicians apply the mathematics they know to solve problems occurring in everyday life.	
Acquisition:		
	<i>Students will know...</i> - The formula for area and circumference of a circle - The value of pi to two places - That complex shapes are made up of simple parts. - Vocabulary: circumference, volume, surface area, pi, complex shapes, face, edge, vertex,	<i>Students will be skilled at...</i> - Given the area of a rectangle, square, parallelogram or triangle finding the missing dimension - Finding the area and circumference of a circle - Calculating the area of complex shapes - Finding the volume of a rectangular and triangular prism - Finding the surface area of rectangular and triangular prism - Applying surface area and volume to authentic problems - Supporting solutions with clear mathematical justification