Math 7 - Unit F Angles - Triangles and Prisms

Unit Focus

In this unit students briefly investigate whether sets of angle and side length measurements determine unique triangles or multiple triangles, or fail to determine triangles. Students also study and apply angle relationships, learning to understand and use the terms "complementary," "supplementary," "vertical angles". The work gives them practice working with rational numbers and equations for angle relationships. Students analyze and describe cross-sections of prisms, pyramids, and polyhedra. They understand and use the formula for the volume of a right rectangular prism, and solve problems involving area, surface area, and volume.

The students will use their geometry skills in the Poster Packaging PBA where they analyze a given box and improve upon it based on their own criteria.

Stage 1: Desired Results - Key Understandings

Standard(s)

Standards

- Common Core
  - *Mathematics: 7*
    - Draw construct, and describe geometrical figures and describe the relationships between them.
    - 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. *(CCSS.MATH.CONTENT.7.G.A.2)*
    - Describe the two-dimensional figures that result from slicing three-dimensional figures, as in plane sections of right rectangular prisms and right rectangular pyramids. *(CCSS.MATH.CONTENT.7.G.A.3)*
    - Solve real-life and mathematical problems involving angle measure, area, surface area, and volume.
    - 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. *(CCSS.MATH.CONTENT.7.G.B.5)*
    - 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. *(CCSS.MATH.CONTENT.7.G.B.6)*

Madison Public Schools Profile of a Graduate

- Analyzing: Examining information/data/evidence from multiple sources to identify possible underlying assumptions, patterns, and relationships in order to make inferences. *(POG.1.2)*

Transfer

Students will be able to independently use their learning to...

T1 Construct viable arguments using clear and appropriate mathematical language and critique the reasoning of others. (MP 3)

T2 Represent situations using mathematical reasoning and symbols (MP 2)

Meaning

Understanding(s)	Essential Question(s)
Students will understand that... **U1** Mathematicians construct viable arguments to explain problems, solutions, and mathematical representations. **U2** Mathematicians work to make sense of the problem before trying to solve it.	*Students will keep considering...* **Q1** What relationship(s) in the diagram do I see? **Q2** What do effective problem solvers do when they get stuck?

Acquisition of Knowledge and Skill

Knowledge	Skill(s)
Students will know... **K1** Vocabulary: straight angle, adjacent angles, right angle, supplementary, complementary, measurement error, vertical angles, vertex (of an angle), intersect, cross	*Students will be skilled at...* **S1** identifying and distinguishing complementary, supplementary, adjacent and vertical angles. **S2** finding missing angle measurements of complementary, supplementary and vertical

Stage 1: Desired Results - Key Understandings		
	section, base (of a prism or pyramid), prism, pyramid, volume, face, surface area, parallel **K2** that given a set of criterial for a shape a triangle may or not be able to be created. **K3** that given a set of criterial for a shape a unique triangle may or not be able to be created. **K4** how to name an angle. **K5** how to classify an angle by its size (acute, straight, right, obtuse) **K6** that the three angles of a triangle have a sum of 180 degrees. **K7** that the volume of any prism is the area of the base times the height of the prism.	angles (both those that involve algebra and those that do not). **S3** identifying the cross section(s) that will result from slicing solids. **S4** using area and volume in application problems. **S5** finding the missing angle of a triangle when given two other angles. **S6** finding the volume of a prism with a triangular base, a rectangular base or some combination of these two bases.