Pre-Algebra – Unit 5: Geometry

Phoenixville Area School District

Stage 1 Desired Results

PA Core Standards:
M07.C-G.1.1 Describe and apply properties of geometric figures.
M07.C-G.2.1 Identify, use, and describe properties of angles and their measures.
M07.C-G.2.2 Determine circumference, area, surface area, and volume.

PSSA Assessment Anchors:
M07.C-G.1 Demonstrate an understanding of geometric figures and their properties.
M07.C-G.2 Solve real-world and mathematical problems involving angle measure, circumference, area, surface area, and volume.

Transfer

TRANSFER GOALS

Students will be able to independently use their learning to…

- ***Problem-Solving:*** Persistently apply various problem-solving strategies and organized approaches to accurately understand and solve problems and provide evidence to support response.
- ***Mathematical Vocabulary:*** Interpret mathematical vocabulary and apply proper terminology to engage in meaningful oral and written expression that communicates mathematical thinking, problem-solving methods, and rationale.
- ***Reasoning:*** Demonstrate mathematical resilience and conceptual understanding through the use of vocabulary, written expression, graphical representation, and alternate strategies.

Meaning

UNDERSTANDINGS

Students will understand that…

- One-, two-, and three-dimensional objects are described, classified, and analyzed by their critical attributes.
- The accurate measurement of space is determined by the ability to visualize the object/problem situation and apply an appropriate algorithm.
- Postulates, theorems, definitions, and properties are used to justify reasoning in a direct proof and establish relationships involving two and three-dimensional figures.
- Trigonometry is rooted in ratios within the right triangle.

ESSENTIAL QUESTIONS

Students will keep considering...

- What are the mathematical attributes of objects or processes and how are they measured or calculated?
- How are spatial relationships, including shape and dimension, used to draw, construct, model and represent real situations or solve problems?
- What does this quantity/number/ expression/value mean? What are the ways to represent it? Is there a best way?
- How do the tools of geometry such as definitions, theorems, and properties foster an increasing ability to spatially visualize and logically deduce conclusions?
- How do I use the properties of right triangles for indirect measurement?

	Knowledge and Skills Acquisition	
	KNOWLEDGE *Students will know…* • Angles & Line Relationships • Triangles • Similar Figures • Triangle Inequality Theorem • Circles • Area of Composite Figures • Volume of Prisms • Surface Area of Prisms • Three Dimensional Figures **VOCABULARY** • Complimentary Angles • Supplementary Angles • Corresponding Angles • Vertical Angles • Adjacent Angles • Alternate-Interior Angles • Alternate-Exterior Angles • Prisms • Volume • Surface Area	**SKILLS** *Students will be skilled at…* • Solving problems involving scale drawings of geometric figures, including finding length and area. • Identifying or describe the properties of all types of triangles based on angle and side measures. • Using and applying the triangle inequality theorem. • Describing the two-dimensional figures that result from slicing three-dimensional figures. • Identifying and use properties of supplementary, complementary, and adjacent angles in a multistep problem to write and solve simple equations for an unknown angle in a figure. • Identifying and use properties of angles formed when two parallel lines are cut by a transversal. • Finding the area and circumference of a circle. Solve problems involving area and circumference of a circle(s). Formulas will be provided. • Solving 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. Formulas will be provided.

Stage 2 – Evidence			
Code A/M/T	**Evaluative Criteria**	**Assessment Evidence**	
A/M/T Acquisition Meaning Making Transfer	*What criteria will be used in each assessment to evaluate attainment of the desired results?*	PERFORMANCE TASK(S) *Students will demonstrate understanding (meaning making and transfer) through complex performance by...* **Optical Art Task** This task combines art, mathematics, and design. Students will use pattern recognition, spatial awareness, and geometry to invent a unique illustration. • ***Goal****:* Your task is to create your own optical art design. • ***Role/Audience****:* You are adding an illustration to an optical art exhibit at an art show. • ***Situation/Product****:* You will create your own piece. • ***Success Criteria****:* Your optical art design must include a pattern, geometric shapes, and be neat. **Painting Youcubed** Students will use pattern recognition, 3D Shapes, and geometry to solve the puzzle. • ***Goal****:* Your task is to analyze the 3D shape and calculate how much paint is needed for the 4x4 cube. • ***Role/Audience****:* As a member of the toy manufacturing team, you need to calculate the paint per toy to be purchased. • ***Situation/Product****:* You will use your knowledge of surface area to make the calculations. • ***Success Criteria****:* You will need to present your calculations to the team leader (teacher) and see if they seem reasonable.	Differentiation Considerations:
A/M/T Acquisition Meaning Making Transfer	*What criteria will be used in each assessment to evaluate attainment of the desired results?*	OTHER EVIDENCE **Unit Test** • Multiple Choice • True/False • Matching • Name two angle *terms*. Compare and contrast. • Describe at least three characteristics of prisms. Include a model. • Explain how surface area is different from volume.	Differentiation Considerations: