Unit 3d-Solve Problems Involving Geometry

Content Area: **Mathematics**
Course(s): **Math 7 PRE-ALGEBRA**
Time Period: **Marking Period 3**
Length: **WK 8-10 MP4 Wk 1-2 Envision Mathematics Topic 10**
Status: **Published**

Big Ideas

- Draw, construct and describe geometrical figures and describe the relationships between them.
- Solve real-life and mathematical problems involving angle measure, area, surface area, and volume

Essential Questions

- How can geometry be used to solve problems?

Cross Curricular Integration

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Integration Area: Science

MS-ETS1-1 Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.

MS-ETS1-2 Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.

MS-ETS1-3 Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success.

MS-ETS1-4 Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.

Activity: Students will review survey results on the needs of walkers and bikers in the area. They will choose an existing path or bikeway and make a scale drawing of the route. They will add improvements or extensions to the drawing that enhance the rails and better meet the needs of users.

CSDT Technology Integration

8.1.8.AP.1: Design and illustrate algorithms that solve complex problems using flowcharts and/or pseudocode.

8.1.8.AP.2: Create clearly named variables that represent different data types and perform operations on their values.

8.1.8.DA.1: Organize and transform data collected using computational tools to make it usable for a specific purpose.

Activity:

After learning about angles, the students will use their information about supplementary, complementary, vertical, and adjacent angles to play the mini golf game. Then, following this activity the students will research mini golf courses. The students will then create their own mini golf course that includes angles and composite figures.

Enduring Understandings

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Geometry

7.G.1 Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.

7.G.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.

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.

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.

7.G.5 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.

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 Practices Focus

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1. Make sense of problems and persevere in solving them. Lesson 3, page 459

2. Reason abstractly and quantitatively. Lesson 2,3,4, page 459

3. Construct viable arguments and critique the reasoning of others. Lesson 1,2,4, page 459

4. Model with mathematics. Lesson 1, page 459

7. Look for and make use of structure. Lesson 1, 2, 3, 4, page 459

8. Look for and express regularity in repeated reasoning. Lesson 1, 4, page 459