Unit 4e-The Pythagorean Theorem

Content Area: **Mathematics**
Course(s): **Math 7 Pre-Algebra Honors**
Time Period: **Marking Period 4**
Length: **WK 8 Go Math! Advanced 2 Module 20**
Status: **Published**

Essential Questions

- How can you prove the Pythagorean Theorem and use it to solve problems?
- How can you test the converse of the Pythagorean Theorem and use it to solve problems?
- How can you use the Pythagorean Theorem to find the distance between two points on a coordinate plane?

Big Ideas

- Understand and apply the Pythagorean Theorem.

Cross Curricular Integration

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 Connection

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

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

Expressions and Equations

8.G.B.6 Explain a proof of the Pythagorean Theorem and its converse.

8.G.B.7 Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions.

8.G.B.8 Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.

Mathematical Practices Focus

1. Make sense of problems and persevere in solving them. Lesson 20.1, 20.3

2. Reason abstractly and quantitatively. Lesson 20.2, 20.3
3. Construct viable arguments and critique the reasoning of others. Lesson 20.1, 20.2
4. Model with mathematics. Lesson 20.1, 20.2, 20.3
5. Use appropriate tools strategically. Lesson 20.1, 20.2, 20.3
6. Attend to precision. Lesson 20.2, 20.3
7. Look for and make use of structure. Lesson 20.2
8. Look for and express regularity in repeated reasoning. Lesson 20.3