

6Richmond Public Schools
Department of Curriculum and Instruction
Curriculum Pacing And Resource Guide – Unit Plan



Course Title/ Course #: Pre-Algebra Math 8

Unit Title/ Marking Period # (MP): Pythagorean Theorem/MP 2

Start day: 69

Meetings (Length of Unit): 6 Days

<i>Desired Results ~ What will students be learning?</i>
<u>Standards of Learning/ Standards</u>
8.10 a) verify the Pythagorean Theorem; and b) apply the Pythagorean Theorem.
<u>Essential Understandings/ Big Ideas</u>
How can the area of squares generated by the legs and the hypotenuse of a right triangle be used to verify the Pythagorean Theorem? For a right triangle, the area of a square with one side equal to the measure of the hypotenuse equals to the sum of the areas of the square with one side each equal to the measures of the legs of the triangle.
<u>Key Essential Skills and Knowledge</u>
<ul style="list-style-type: none">• Identify the parts of a right triangle• Verify a triangle is a right triangle given the measures of the three sides.• Verify the Pythagorean theorem using diagrams, concrete manipulatives, and measurements.• Find the measure of a side of a right triangle, given the measure of the other two sides.• Solve practical problems involving right triangles using the Pythagorean Theorem.

Vocabulary

Right Triangle Leg Hypotenuse Pythagorean Theorem Pythagorean Triple	Square Square root Diagonal	
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Assessment Evidence ~ What is evidence of mastery? What did the students master & what are they missing?

Assessment/ Evidence

Mulligan Checkpoint 8.10

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Interactive Achievement

HCPS Mini Quizzes

Students should be able to label the parts of a right triangle.

Students should be able to identify squares on a right triangle add up to a larger square on the hypotenuse of a triangle.

Students should be able to prove whether a triangle is right, given three sides or three numbers.

Students must be able to solve for a leg or a hypotenuse.

Students should be able to solve practical problems involving Pythagorean theorem.

Project Example #1: [Pythagorean Theorem Project](#)

Project Example #2:

Pythagorean Theorem Project

In math class, you have learned about the Pythagorean Theorem ($a^2 + b^2 = c^2$). You have also seen examples of how the Pythagorean Theorem is used in 'real life.' For this task you will create your own "real life" Pythagorean Theorem word problem and model using the following steps:

1. **Write a word problem** that involves using the Pythagorean Theorem to solve the problem.

- The word problem must be typed.
- The word problem must show how the Pythagorean Theorem is used in the real world.
- The word problem must use appropriate mathematical vocabulary.
- The word problem must include appropriate units of measurement. (For example, a T.V. would be measured in inches, not miles).

2. **Solve the word problem you created**, showing all appropriate steps (typing not required)

3. **Create a 3D model that represents your word problem.** Examples: Diorama, Poster with 3D art materials glued to it (string, cotton balls, etc.), miniature model, etc. BE CREATIVE!!!!

- The legs and hypotenuse of your “real life” right triangle must be clearly identified and labeled.
- You must write the measurements of the legs and hypotenuse. If any other measurements are required, clearly label those measurements on your model.

4. **Write a reflection** about your results

You must write a reflection about your project once you have completed it. You should explain how you came up with your word problem idea. You should discuss your results and explain whether or not they make sense.

Learning Plan ~ What are the strategies and activities you plan to use?

Learning Experiences/ Best Practice

- Discovery activity:

Using Angle-Legs and square tiles, have the students create a right triangle. Discuss the parts of a right triangle and have them label the parts of it on a note sheet or interactive notebook. Have the students create squares on each of the legs. Then have the students to *move* those squares from the legs onto the hypotenuse. The students should see that the sum of the squares of the legs is equal to the square of the hypotenuse. Have them do the same for another right triangle.

Then, have the students prove that a triangle is not a right triangle. They may say that you can “see” that it is not a right triangle, but tell them they must prove it! From this activity, they should see that the sum of the squares of the legs do not create a *square* on the hypotenuse.

After this activity, introduce the equation for the Pythagorean theorem stressing the word squares when saying the formula.

Use whiteboards to prove or disprove the Pythagorean theorem by giving the students the measures of all sides of several triangles.

- Activity:

Show the NBC Learn video [The Science of NFL Football: The Pythagorean Theorem](#) to show the students the application of Pythagorean theorem before solving for missing sides. Ask them how they think they can find the distance the player must run.

Use a notesheet/graphic organizer/interactive notebook to guide students on how to solve for the missing side of a right triangle. Use whiteboards until students are able to show mastery without your guidance.

- Activity:

Guide students through the gizmo lessons followed by doing several examples on whiteboards until students can show mastery for determining a right triangle and solving for the missing side of a right triangle.

- Activity

Alex Lesson Plan-[Pythagorean Theorem](#)

- Activity

Show students several other real life applications of the Pythagorean theorem (using google maps of their neighborhoods to find the shortest distance between two locations). Have students create triangle to solve practical problems. For independent practice: cut up word problems and glue them on colored card stock to create task cards. Have students work in pairs to solve the word problems.

Technology Integrations

Gizmo
Educational Games-under resources
Compass Learning
Allen Teachers
Brain Pop
Khan Academy

Resources

Text:

Glencoe Pre-Algebra pages:
581-587 (Lab-The Pythagorean Theorem)
589-594 (The Distance Formula)
Mulligan Math in Minutes 8.10
SOL Coach Book Va Edition: pages 108-112

Technology:

Gizmo-[Pythagorean Theorem with Geoboards](#)- Interactive Instructional Resource
Gizmo-[Pythagorean Theorem Activity B](#)- Interactive Instructional Resource
NBC Learn-[The Science of NFL Football: The Pythagorean Theorem](#)-Instructional Video
Brain Pop-[Pythagorean Theorem](#)-Interactive Skills Practice
You Tube-[Pythagorean Theorem Rap](#)-Song
Compass Learning-<https://www.thelearningodyssey.com> - M7133, M7135, M7138, 8092, M8121, M8124,

Virginia Department of Education

VDOE-[Pythagorean Theorem](#)-Lesson Plan

Other Sites

HCPS - [Pythagorean Theorem](#) - Instructional materials, practice page, assessments

Regents Prep-[Demonstrating the Pythagorean Theorem](#)-
Alex-[Pythagorean Theorem](#)-Alabama Learning Exchange Lesson Plan

Cross Curricular Connection

English-Have students explain what the Pythagorean theorem equation means in words. Have students complete Pythagorean theorem project example #2 which contains creating a summary and writing a word problem.

History: Read to students about the history of Pythagoras. Have students do research on Pythagoras.

Art: Have students complete project #2 in which they must create a diagram or drawing of their word problem.

Music/Dance/Drama: Have students create a song/skit about the history of Pythagoras and where it is seen in real life applications.