

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



Course Title/ Course #: Geometry

Unit Title/ Marking Period # (MP#2): Triangles

Start day:

Meetings (Length of Unit): 4 days

Desired Results ~ What will students be learning?

Standards of Learning/ Standards

G.8

The student will solve real-world problems involving right triangles by using the Pythagorean Theorem and its converse, properties of special right triangles and right triangle trigonometry.

Essential Understandings/ Big Ideas

- The Pythagorean Theorem is essential for solving problems involving right triangles.
- Many historical and algebraic proofs of the Pythagorean Theorem exist.
- The relationships between the sides and angles of right triangles are useful in many applied fields.
- Some practical problems can be solved by choosing an efficient representation of the problem.
- Another formula for the area of a triangle is $A = \frac{1}{2} ab \sin C$
- The ratios of side lengths in similar right triangles (adjacent/hypotenuse or opposite/hypotenuse) are independent of the scale factor and depend only on the angle the hypotenuse makes with the adjacent side, thus justifying the definition and calculation of trigonometric functions using the ratios of side lengths for similar right triangles

Key Essential Skills and Knowledge

- Determine whether a triangle formed with three given lengths is a right triangle.
- Solve for missing lengths in geometric figures, using properties of 45° - 45° - 90° triangles.

- Solve for missing lengths in geometric figures, using properties of 30° - 60° - 90° triangles.
- Solve problems involving right triangles, using sine, cosine, and tangent ratios.
- Solve real-world problems, using right triangle trigonometry and properties of right triangles.
- Explain and use the relationship between the sine and cosine of complementary angles.

Vocabulary

Right Triangle Hypotenuse Leg Short Leg Complementary Angle	Pythagorean Theorem Sine Cosine Long Leg	Trigonometry Tangent Opposite Adjacent
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Assessment Evidence ~ What is evidence of mastery? What did the students master & what are they missing?

Assessment/ Evidence

Interactive Achievement

[Mulligan Checkpoint G.8](#)

Henrico Practice Quiz

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

Learning Experiences/ Best Practice

- When working with the Pythagorean Theorem have students solve for the missing side using literal equations before substituting values for the variables.
- When working with special right triangles have student label the sides (short leg, long leg, and hypotenuse) with different colors. Associate the number of different angle measures with the number under the square root symbol.
- Use mnemonics to help with students remembering the trigonometric ratios.
- Have students label sides with letters A, H, O (adjacent, hypotenuse, opposite) before trying to find the trigonometric ratios.

Technology Integrations

Gizmo
Khan Academy
Virtual Nerd
Discovery Education

Resources

Text

Geometry, ©2012, Price, et al, McGraw-Hill School Education Group page(s) 541-581

Coach book, Virginia edition, Lesson 17-19 page(s) 138-158

Mulligan Math in Minutes

Technology

Gizmo

[Sine, Cosine and Tangent Ratios](#)

Virginia Department of Education

[The Pythagorean Relationship](#)

[Special Right Triangles and Right Triangle Trigonometry](#)

Other

[Right Triangles \(Real World Problems\)](#)

Cross Curricular Connection

Technology

Students can explore the use of triangles in GPS systems and mapping

Extended Core/Electives

Explore the use of right triangles in architecture, planning, and design of all types of structures (buildings, bridges, ramps, highways, etc.)

Explore the angle of pursuit in football as it relates to right triangles and the Pythagorean Theorem

Driver's Education can discuss triangular Road signs

Art can discuss the importance in some works of being sure that there is similarity

History

Research can be done on Pythagoras and also on the development of Trigonometry.

Science

Triangles used in Astronomy and Physics

English

Students can use research from History to write essays.