Trigonometry Statistics CP Unit 3: Solving Right and Oblique Triangles

Unit #:	APSDO-00018001	Duration:	5.0 Week(s)	Date(s):	

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Grades:
11, 12
Subjects:
Mathematics

Unit Focus

In this unit, students will expand their knowledge of trigonometric ratios to solve right and oblique triangles. Students will discover new ways of finding the area of oblique triangles and will solve real-world application problems that utilize the skills learned in the unit. Summative assessments may include projects, labs, and tests.

Stage 1: Desired Results - Key Understandings

Established Goals

Common Core
Mathematics: 11

- Understand and apply the Law of Sines and the Law of Cosines to find unknown measurements in right and non-right triangles (e.g., surveying problems, resultant forces). *CCSS.MATH.CONTENT.HSG.SRT.D.11*
- Use inverse functions to solve trigonometric equations that arise in modeling contexts; evaluate the solutions using technology, and interpret them in terms of the context. *CCSS.MATH.CONTENT.HSF.TF.B.7*

Transfer

T1 (T50) Based on an understanding of any problem, initiate a plan, execute it and evaluate the reasonableness of the solution.
T2 (T53) Articulate how mathematical concepts relate to one another in the context of a problem or in the theoretical sense.
T3 (T51) Examine alternate methods to accurately and efficiently solve problems.
T4 (T52) Use appropriate tools strategically to deepen understanding of mathematical concepts.
T5 (T32) Apply appropriate formulas to determine the unknown.

Meaning

Understandings	Essential Questions
U1 (U104) Mathematics is a universal language that uses assumed and logical	**Q1** (Q405) How do I use measurements about the shape to calculate additional

- Derive the formula A = 1/2 ab sin(C) for the area of a triangle by drawing an auxiliary line from a vertex perpendicular to the opposite side. *CCSS.MATH.CONTENT.HSG.SRT.D.9*
- Prove the Laws of Sines and Cosines and use them to solve problems. *CCSS.MATH.CONTENT.HSG.SRT.D.10*
- Look for and express regularity in repeated reasoning. *CCSS.MATH.MP.8*
- Model with mathematics. *CCSS.MATH.MP.4*
- Reason abstractly and quantitatively. *CCSS.MATH.MP.2*

statements to describe the world.
U2 (U105) Mathematicians develop new understandings based on established relationships/ theorems/ postulates.
U3 (U408) Trigonometry is based on the relationship between sides and the angles in any triangle.
U4 (U511) Placing a problem in a category gives you a familiar approach to solving it.
U5 (U530) Every problem belongs to a category of problems that has a similar structure and set of characteristics; which means it can be solved using a similar model.
U6 (U561) Recognition of patterns and structures fosters efficiency in solving problems.

information about it?
Q2 (Q406) What is the theorem/formula necessary to solve this problem? (Gr. 5-12)
Q3 (Q409) How do some values in a triangle determine others?
Q4 (Q511) What characteristics/attributes define this type of problem?
Q5 (Q513) How could this strategy be used to solve similar problems?
Q6 (Q532) Which model best represents this problem?
Q7 (Q572) How does understanding the pattern/structure help me solve the problem?

Acquisition of Knowledge and Skill

Knowledge

Skills

S1

Use trigonometry functions to solve right triangles

S2

Apply trigonometric functions to solve problems that involve angles of elevation and depression

S3

Derive the formula for the area of an oblique triangle and use the formula to solve problems

S4

Use Heron’s formula to find the area of oblique triangles

S5

		Solve oblique triangles using Law of Sines and Cosines **S6** Understand how trigonometry is used to solve real world problems

Stage 3: Learning Plan

Coding	Code	Description of Learning Activity