Unit 7 Right Triangles and Trigonometry

Content Area: **Math**
Course(s):   **CP Geometry**
Time Period: **Marking Period 3**
Length: **4**
Status: **Published**

Unit Overview

In this ~~chapter~~ unit students investigate side lengths and angles in triangles. They start by using the Pythagorean Theorem to find the length of the third side in a right triangle, then use the Converse of the Pythagorean Theorem, and other theorems, to decide if three given sides lengths form an acute, right, or obtuse triangle. Students explore ratios of lengths formed by an altitude to the hypotenuse of a right triangle and use the ratios of side lengths for a 45°-45°-90° triangle and a 30°-60°-90° triangle. Finally, students apply trigonometric ratios to find side lengths and angle measures in triangles.

Enduring Understandings

Special relationships exist within right triangles.

Students will understand and use the Pythagorean Theorem and its converse.

Students will understand and use special relationships in right triangles.

Students will understand and use trigonometric ratios to solve right triangles.

Essential Questions

How can you use Pythagorean Theorem to find missing side lengths in right triangles?

What are the ratios between side lengths of a 45-45-90 triangle?

What are the ratios between side lengths of a 30-60-90 triangle?

What is sine?

What is cosine?

What is tangent?

How can the trigonometric ratios help us find missing information about triangles?

What are the real life applications of the trigonometric ratios?

New Jersey Student Learning Standards (No CCS)

MA.G-CO.C	Prove geometric theorems
MA.G-CO.C.10	Prove theorems about triangles.
MA.G-SRT	Similarity, Right Triangles, and Trigonometry
MA.G-SRT.A	Understand similarity in terms of similarity transformations
MA.G-SRT.B	Prove theorems involving similarity
MA.G-SRT.B.5	Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures.
MA.G-SRT.C	Define trigonometric ratios and solve problems involving right triangles
MA.G-SRT.C.6	Understand that by similarity, side ratios in right triangles are properties of the angles in the triangle, leading to definitions of trigonometric ratios for acute angles.
MA.G-SRT.C.7	Explain and use the relationship between the sine and cosine of complementary angles.
MA.G-SRT.C.8	Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems.
MA.G-GPE.B	Use coordinates to prove simple geometric theorems algebraically
MA.G-GPE.B.4	Use coordinates to prove simple geometric theorems algebraically.
MA.G-MG	Modeling with Geometry
MA.G-MG.A	Apply geometric concepts in modeling situations
MA.G-MG.A.1	Use geometric shapes, their measures, and their properties to describe objects (e.g., modeling a tree trunk or a human torso as a cylinder).
MA.G-MG.A.3	Apply geometric methods to solve design problems (e.g., designing an object or structure to satisfy physical constraints or minimize cost; working with typographic grid systems based on ratios).

Interdisciplinary Connections

LA.W.9-10.6	Use technology, including the Internet, to produce, share, and update individual or shared writing products, taking advantage of technology's capacity to link to other information and to display information flexibly and dynamically.
SCI.HS-ETS1-2	Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.
TECH.8.1.12.C.CS4	Contribute to project teams to produce original works or solve problems.

Technology Standards

TECH.8.1.12.C.CS4	Contribute to project teams to produce original works or solve problems.
TECH.8.1.12.D.CS3	Exhibit leadership for digital citizenship.
TECH.8.1.12.E.CS4	Process data and report results.
TECH.8.1.12.F.CS3	Collect and analyze data to identify solutions and/or make informed decisions.

TECH.8.1.12.F.CS4	Use multiple processes and diverse perspectives to explore alternative solutions.
TECH.8.2.12.C.CS2	The application of engineering design.

21st Century Themes/Careers

CAEP.9.2.12.C.3	Identify transferable career skills and design alternate career plans.

Financial Literacy Integration

PFL.9.1.12.C.1	Compare and contrast the financial benefits of different products and services offered by a variety of financial institutions.
PFL.9.1.12.C.2	Compare and compute interest and compound interest and develop an amortization table using business tools.
PFL.9.1.12.C.3	Compute and assess the accumulating effect of interest paid over time when using a variety of sources of credit.

Instructional Strategies & Learning Activities

- Use the book activities and extensions to give added dimension.
- Baseball problem and various application problems.
- Partner/group work.
- Lesson discovery activities.
- Use problems and activities from book involving modeling problems.
- Provide access to online book
- Provide access to book pages and problems through Canvas and Twitter
- Provide access to review keys

Formative Assessments

- Daily homework checks
- Quiz
- ~~Chapter~~ Unit Test
- Exit Tickets
- Warm-ups

Summative Assessment

- Unit Test
- Unit Project (Optional)

Benchmark Assessments

Students will take NJSLA Geometry Benchmark A

Alternate Assessments

- Modified homework
- Modified quizzes
- Modified tests
- Modified projects