

Geometry Unit Design

Unit Title: *Three Cheers for Triangles! (High School Geometry)*

Standards Addressed:

- N.Q.1 Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.
- G.CO.1 Know precise definitions of angle, circle, perpendicular line, parallel line, and line segment, based on the undefined notions of point, line, distance along a line, and distance around a circular arc.
- N.Q.3 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.
- G.C.10 Prove theorems about triangles. Theorems include: measures of interior angles of a triangle sum to 180° ; base angles of isosceles triangles are congruent; (the segment joining midpoints of two sides of a triangle is parallel to the third side and half the length;) the medians of a triangle meet at a point.
- G.SRT.8 Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems.
- G.SRT.7 Explain and use the relationship between the sine and cosine of complementary angles.

By the end of the unit, what will students come to...

Know	Understand	Be Able to Do
<p>K1: Vocabulary Pythagorean theorem, trigonometric ratios, sine, cosine, tangent, isosceles, median, equilateral, scalene, equiangular</p> <p>K2: How to use the Pythagorean theorem</p> <p>K3: Angle Addition Postulate</p> <p>K4: Write trig ratios (SOH-CAH-TOA)</p> <p>K5: Triangle inequality theorem</p> <p>K6: Find the exterior angle of a triangle</p>	<p>U1: triangles are classified, and their properties defined, by angle and /or side relationships</p> <p>U2: precise definitions and properties come together to form mathematical proof</p> <p>U3: Specific relationships exist among sides and angles in right triangles that allow for calculations of indirect measurement.</p>	<p>D1: Demonstrate and justify why the 3 angles of a triangle add up to 180°.</p> <p>D2: Explain and apply the isosceles triangle theorem and its converse</p> <p>D3: Prove the Pythagorean theorem using triangle similarity.</p> <p>D4: solve applied problems using trigonometric ratios and the Pythagorean theorem (incorporates the “modeling” piece of the standard)</p> <p>D5: Diagram and explain the relationship between the</p>

<p>K7: Classify triangles</p>		<p>sine and cosine of complementary angles. Use this relationship to solve problems</p>
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Pre-Assessment Ideas: Pre-test, Frayer x 4 (first time), individual KWL to see what they remember from Middle School and Algebra 1

Summative Assessment Ideas: Unit test; Triangles Around Us project (Authentic assessment idea) – find a minimum of 10 triangles and classify and analyze the triangles, angle measures and side lengths. Explain and justify why that type of triangle was appropriate for its use and location. Must include a minimum of 5 applications of Trigonometric ratios.

Formative Assessment Ideas: Construct clinometers and use to measure various heights such as the top of the high school, the top of the flagpole, etc. Additional: exit cards, white boards, turn and talks, hands and brains, homework, note binder, sorting activities, build a square, discussions

Resources: White boards, 100 Charts, Base 10 manipulatives, cards, 2-digit addition games (3 in a Row, Addition War, etc...)