Subject:	Grade:	Unit #:	Title:

UNIT OVERVIEW

STAGE ONE: Identify Desired Results

Established Goals/Standards

G.CO.1
G.CO.9
G.CO.10
G.SRT.1
G.SRT.2
G.SRT.3
G.SRT.4
G.SRT.5
G.SRT.6
G.SRT.7
G.SRT.8
G.MG.1

Long-Term Transfer Goal

At the end of this unit, students will use what they have learned to independently…

Use proportional relationships and similarity to solve problems involving angles and distance.

Meaning

Enduring Understandings

Scholars will understand that…

In similar figures all corresponding pairs of angles are congruent and all corresponding pairs of sides are proportional.

By similarity, side ratios in right triangles are properties of the angles in the triangle, leading to definitions of trigonometric ratios for acute angles.

The sine and cosine of complementary angles are equal.

Trigonometric ratios and the Pythagorean Theorem can be used to solve right triangles in applied problems.

Geometric shapes, their measures, and their properties can be used to describe objects.

Essential Questions

Scholars will consider such questions as…

What is the relationship between similarity and size transformations?

How can deductive arguments be used to show similarity of two figures?

What are the special properties of similar triangles and how do these properties lead to the definition of the trigonometric ratios?

Acquisition

What knowledge will students learn as part of this unit?

Similarity and congruence,
Similarity and triangles,
Similarity and right triangle trigonometry,
Similarity and proportionality,
Angle sum formulas for polygons,
Triangle inequality and extension to other polygons,
Angles relationships in parallel lines cut by a transversal,
Vertical angles and angle sums in polygons,
Solving problems using similarity
Solving problems using right triangle trigonometry,
Similarity proofs,
Radian measure

What skills will students learn as part of this unit?

Justify whether two figures are similar or congruent

Use justify angle relationships created by intersecting and parallel lines

Reason deductively to justify a conclusion or to create a counterexample

Apply trigonometric relationships to determine side lengths and angle measures of right triangles.

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STAGE TWO: Determine Acceptable Evidence	
	Assessment Evidence
Criteria to assess understanding: *(This is used to build the scoring tool.)* Development of two plans: detail, use of vocabulary, variety of plans. Justification for why the plans will work using appropriate math terminology. Evidence of carrying out a plan with accuracy.	Performance Task focused on Transfer: Out of Class task: Building Measurement: Find something in your neighborhood that is too tall for you to measure directly. For example, you might choose the height of your roof or the height of a tree. a. Describe in detail two ways you could find the height of this object indirectly. Use ideas you learned in this unit. Be sure to explain why your methods work. b. Carry out one of your plans. Give the specific measurements you make directly. Show how you use those measurements to find the object's height.
	Other Assessment Evidence: Students will complete an in-class assessment comprised of "The Ladder" problem and a flashlight problem along with examples of Regents Exam questions based upon Similarity and Trigonometry.

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T, M, A *(Code for Transfer, Meaning Making and Acquisition)*	**STAGE THREE: Plan Learning Experiences**	
	Learning Events:	Evidence of learning: *(formative assessment)*
	What is a Shadow?	
M	- Day 1 Mobile Puzzles (group work intro)	-Discussion of usefulness of mobile activity
M	- How Long is a Shadow?	-Scholar responses to 3 prompts "What is a Shadow?" and group responses to Defining Variables
M	- Day 2 Experimenting with Shadows	-Exit Ticket: scholar responses to how variables impact shadow length.
M	- The Shadow Model	-Scholars share shadow model diagrams.
A	-Day 3 An N-by-N Window	-Scholars will discuss patterns and formulas discovered.
M	- Shadow Data Gathering	-Groups will present charts representing findings from experiments
M	-Day 4 Working with Shadow Data	-Groups present relationships between variables
A	**The Shape of It,** Pattern Block Investigations	-Scholars record measurements on interior angles of traced pattern blocks
M	-Day 5 (Finish Pattern Block Investigation) - Degree Discovery	
M	- Polygon Angles	-Complete table of polygon angles

	-Day 6 An Angular Summary - From Another Angle - Begin “draw the same shape” -Day 7 - Formative Assessment #1 - Draw the Same Shape -Day 8 How to Shrink it? - The Statue of Liberty’s Nose -Day 9 Make it Similar - Ins and Outs of Proportion - Inventing Rules - Polygon Equations (for homework) -Day 10 Similar Problems - Identifying Corresponding Parts worksheet - Homework on similar polygons -Day 11 **Triangles Galore,** - Triangles Versus Other Polygons (shorten) - How Can They Not Be Similar (page 97) talk about this when doing Triangles versus Other Polygons - Angles and Counterexamples -Short formative assessment exit ticket (20 min) -Day 12 - More Similar Triangles - Why are Triangles Special? - Are Angles Enough? - Day 13 In Proportion - What’s Possible? - Is it Sufficient (pages 99-100)	-Homework on missing angles in polygon

	-Day 14 -Day 15 Very Special Triangles - Angle Observations -Day 16 More About Angles - Inside Similarity - Fit Them Together (page 102) - Parallel Proof -Day 17 Angles, Angles, Angles **The Lamp Shadow,** -Day 18 Bouncing Light - Now You See It, Now You Don't -Day 19 Mirror Magic - Mirror Madness -Day 20 A Shadow of a Doubt - To Measure a Tree -Day 21 More Triangles for Shadows **The Sun Shadow,** -Day 22 Introduction and Sun Shadow Problem - Right Triangle Ratios - Sin, Cos, and Tan Revealed - Homemade Trig Tables -Day 23 Your Opposite is My Adjacent - The Tree and the Pendulum -Exactly One-Half (page 104) - Eye Exam and Lookout Point (page 105) - Sparky and the Dude - Pole Cat -Day 24 A Bright, Sunny Day - Fit Them Together -Day 25 Similar Areas	

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