Unit 7- *Trigonometric Functions*

Overview

This is the first time that many students will see any trigonometry beyond SOHCAHTOA, for example, radian measure, law of sines and law of cosines, the reciprocal trigonometric functions, trigonometric graphs. We chose specifically to emphasize the Unit Circle, and to simply use "circle definitions" for problems like sin(240). Students should come away from this unit feeling like many trigonometric topics can simply be done with x, y, and r (circle definitions). There are many variations of this type of problem, but students should feel the unity among them. Students need to know the basic side patterns for special right triangles along with how to draw angles in standard position.

21st Century Capacities: Analyzing, Collective Intelligence

Stage 1 - Desired Results

ESTABLISHED GOALS/ STANDARDS

MP 1 Make sense of problems and persevere in solving them
MP3 Construct viable arguments and critique the reasoning of others
MP5 Use appropriate tools strategically
MP7 Look for and make use of structure

F.TF.1 Understand radian measure of an angle as the length of the arc on the unit circle subtended by the angle. F.TF.2 Explain how the unit circle in the coordinate plane enables the extension of trigonometric functions to all real numbers, interpreted as radian measures of angles traversed counterclockwise around the unit circle.

F.TF.5 Choose trigonometric functions to model periodic phenomena with specified

Transfer:

Students will be able to independently use their learning in new situations to...

1. Manipulate equations and expressions to create order and establish relationships.
2. Draw conclusions about graphs and equations. (Analyzing)
3. Work respectfully and responsibly with others, exchanging and evaluating ideas to achieve a common objective (Collective Intelligence)

Meaning:

UNDERSTANDINGS: *Students will understand that:*

1. Effective problem solvers work to make sense of the problem before trying to solve it.
2. Mathematicians identify relevant tools, strategies, relationships, and/or information in order to draw conclusions.

ESSENTIAL QUESTIONS: *Students will explore & address these recurring questions:*

A. How can I break a problem down into manageable parts?
B. What methods can I use to monitor my thinking/accuracy?
C. How can understanding a pattern help me?

amplitude, frequency, and midline.★ F.TF.8 Prove the Pythagorean identity sin2(θ) + cos2(θ) = 1 and use it to find sin (θ), cos (θ), or tan (θ), given sin (θ), cos (θ), or tan (θ), and the quadrant of the angle.	***Acquisition:***	
	Students will know… 1. The six trigonometric functions, right triangle and circle definitions 2. The Law of Sines 3. The Law of Cosines 4. Hero's formula 5. Area of Triangle = ½(2 sides)(included angle) 6. Radian measure 7. The reciprocal identities 8. The Pythagorean identities 9. Vocabulary: unit circle, radian, sine, cosine, tangent, amplitude, periodic behavior, Pythagorean identity, coterminal	*Students will be skilled at…* 1. Fluently using the six trig functions to solve right triangles 2. Fluently using the ratios of 30-60-90 and 45-45-90 triangles 3. Solving applied problems involving trigonometry 4. Using the unit circle to find the radian measures of angles and finding coterminal and reference angles for given angles. 5. Finding sin, cos and tan of angles using the unit circle 6. Finding sin, cos or tan given a point on the terminal side of the angle 7. Given the trig function, finding and graphing the angle in the correct quadrant. 8. Graphing sin and cos functions and their transformations 9. Using sin and cos functions to model behavior 10. Solving trigonometric equations