Common Core State Standards for Mathematics		
Domain: Trigonometric Functions		
Extend the Domain of Trigonometric Functions Using the Unit Circle (F-TF.1-4)		
High School		
Score 4.0	**In addition to Score 3.0, in-depth inferences and applications that go beyond instruction to the standard. The student will:** • use special triangles to determine geometrically the values of cosecant, secant and cotangent for π/3, π/4 and π/6 and uses the unit circle to express the values of cosecant, secant and cotangent for π-x, π+x and 2π-x in terms of their values for x where x is any real number (F-TF.3) • use the unit circle to explain symmetry (odd and even) and periodicity of trigonometric functions (F-TF.4~~)~~	**Example Activities** Spaghetti Trigonometric Functions from the Unit Circle – Students will use the understanding that they gained from the spaghetti activity to write a detailed explanation as to how the unit circle creates symmetry within trigonometric functions as well as the relationship between the unit circle and the periodicity of the unit circle.
	3.5 In addition to score 3.0 performance, in-depth inferences and applications with partial success.	
Score 3.0	**The student will:** • 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 transverse counterclockwise around the unit circle (F-TF.2) • use special triangles to determine geometrically the values of sine, cosine and tangent for π/3, π/4 and π/6 and use the unit circle to express the values of sine, cosine and tangent for π-x, π+x and 2π-x in terms of their values for x where x is any real number (F-TF.3) **The student exhibits no major errors or omissions.**	Spaghetti Trigonometric Functions from the Unit Circle – Students will need a piece of string four inches long, raw spaghetti sticks, tape, two blank pieces of legal paper, a pre-created unit circle (radius 1 in.) with sine and cosine values marked for each of the four major angles in the four quadrants. The students will work individually and will be assigned either the sine function or the cosine function. Students will then use the string to measure and marc the length from either the *x-axis* (cosine) or the *y-axis* (sine) to each of the four angles (0, π/3, π/4 and π/6) and the angles in those corresponding positions in each of the other three quadrants. Students will then break spaghetti sticks to match the lengths of each measure on the string. Finally the students will create a Cartesian Plane using the two legal sheets of paper. Students will then place the spaghetti sticks on the Cartesian Plane creating the oscillating sine/cosine function. Students will then be required to write a summary of their understanding of how the angles of the unit circle correspond to the sine/cosine functions and how the function values extend for all real numbers on the Cartesian Plane.
	2.5 No major errors or omissions regarding 2.0 content and partial knowledge of the 3.0 content	
Score 2.0	**There are no major errors or omissions regarding the simpler details and processes as the student will:** • recognize or recall specific vocabulary, such as: ○ radian measure of an angle is the length of the arc on the unit circle subtended by the angle (F-TF.1) • perform basic processes, such as: **However, the student exhibits major errors or omissions regarding the more**	Marzano Vocabulary Template – Students will be given key vocabulary such as radian measure, unit circle, arc length… Students will fill in the Marzano vocabulary template for each of the key words for the unit. The completed templates will be placed into the student's interactive vocabulary notebooks.

	complex ideas and processes.		
	1.5	Partial knowledge of the 2.0 content but major errors or omissions regarding the 3.0 content	
Score 1.0	**With help, a partial understanding of some of the simpler details and processes and some of the more complex ideas and processes.**		
	0.5	With help, a partial understanding of the 2.0 content but not the 3.0 content	
Score 0.0	**Even with help, no understanding or skill demonstrated.**		

Term:	**My Understanding** **1 2 3 4**
My Definition:	**Visual Trigger:**
Samples of the Concept:	**Non-Examples:**