Trigonometry Scope & Sequence

Days May Vary	Unit	Essential Unit Outcomes	Essential/Guiding Questions
6-8	Unit 1: Trigonometric Functions	• Sketch an angle and define specific information about the angle. • Define and evaluate trigonometric functions (exact and approximate) of angles. • Use trigonometric functions to solve real world functions. • Review Geometric topics.	• What prior knowledge from geometry is used to define and derive trigonometric concepts? • How are the trigonometric functions and right triangles used to solve real world problems?
9-11	Unit 2: Acute Angles and Right Triangles	• Sketch an angle and define specific information about the angle. • Define and evaluate trigonometric functions (exact and approximate) of angles. • Use trigonometric identities to evaluate angle and triangle problems. • Use trigonometric functions to solve real world functions. • Review Geometric topics. • Define trigonometric functions	• What prior knowledge from geometry is used to define and derive trigonometric concepts? • How are the trigonometric functions and right triangles used to solve real world problems? • How can trigonometry be used to improve sports performance?

		and basic trigonometric identities with respect to a point. ● Define trigonometric functions and basic trigonometric identities with respect to a triangle. ● Solve right triangles using the trigonometric functions.	
6-8	Unit 3: Radian Measure	● Convert between radian and degree measures. ● Calculate arc length and area of a sector. ● Find exact trigonometric values of radian measures (special angles) using the unit circle. ● Calculate angular and linear speed. ● Determine a relationship between degree and radian measure and apply to circular functions.	● For what types of problems would radian measure best be used? ● Compare/contrast arc length and area of a sector. ● How do the values of the six trigonometric functions relate to the coordinates of the unit circle? ● What information is needed to calculate linear and angular speeds? ● What do we know about the relationship between radians and degrees? ● How is our solution related to pi? ● Thinking back to geometry, what do we know about the

			relationship between the central angle and arc length? ● What strategy did you use to find your solution? ● What is the definition of arc length? How is arc length related to the central angle? ● What is a strategy for converting between radians and degrees?
10-12	Unit 4: Graphing Trigonometric Functions	● Graph an equation of the general form . ● Write the equation of a trigonometric function in general form, given the graph. ● Write the equation in general form and draw the graph of a trigonometric function, given an application problem. ● Graph the six circular functions, their transformations, and use them in applications.	How does graphing circular functions relate to your previous graphing experiences?
7-9	Unit 5: Trigonometric Identities	● Recognize and apply the fundamental, sum and difference, double angle, and half angle identities.	● Given a trigonometric function involving angles, other than special angles, how is it possible to solve it

		- Verify trigonometric identities. - Simplify and evaluate trigonometric expressions.	using values of known angles? How can the cosine difference formula be related to common household electric current?
10-12	Unit 6: Inverse Trigonometric Functions and Trigonometric Equations	- Find the exact and approximate values of inverse trigonometric functions. - Graph inverse trigonometric functions - Evaluate composite inverse trigonometric functions. - Define and graph inverse trigonometric functions. - Solve equations by linear methods. - Solve equations by factoring or using the quadratic formula. - Solve equations by squaring both sides. - Solve equations by substituting trigonometric identities. - Solve equations with half angle and multiple angle formulas. - Solve equations involving inverse trigonometric functions. - Solve equations involving	- Why are there restrictions placed on the inverse trigonometric functions - Why are algebraic methods applicable for trigonometric equations? Prove this.

		trigonometric functions.	
7-9	Unit 7: Law of Sines and Cosines and Vectors	• Find complete solutions for triangles. • Determine the correct law to apply to a triangle for complete solutions. • Find the area of an oblique triangle. • Students will define law of sines and cosines • Students will apply law of sines and cosines to solve triangles • Students will find areas of triangles (Sine formula and Heron's formula) • Find complete solutions for triangles. • Determine the correct law to apply to a triangle for complete solutions. • Find the area of an oblique triangle. • Solve real-world problems using laws of sine and cosine.	• Why does the Pythagorean Theorem not work on oblique triangles? • Why, with the Law of Sines, is it possible to have two resultant triangles in comparison to only having one resultant triangle with the Law of Cosines? • How can we use law of sines or cosines to find ground distance using aerial photography?
10-12	Unit 8: Conic Sections	• Find the equation of a circle given its center and radius. • Find the center and radius of a circle given its equation.	• What are the similarities and differences between the four conic sections? • What are the important

		- Graph a conic section given its equation. - Write the equation of a conic section given certain conditions. - Identify the vertex, axis of symmetry, directrix, focus and focal chord of a parabola. - Identify the center, major and minor axes, vertices, foci, focal chords and eccentricity of an ellipse. - Identify the center, transverse axis, conjugate axis, vertices, foci, and asymptotes of hyperbola. - Apply the properties of conics to real world situations. - Identify the conic section by examining the general form of a conic section.	- characteristics of each conic section and how is each found? - Can you identify the conic from the general form of a conic section?
9-11	Unit 9: Polar and Parametric Equations	- Graph and express equations in rectangular and polar form. - Graph and express equations in rectangular and parametric form. - Solve application problems with parametric equations. - Write rectangular equations in	Why is it important to write equations in other forms?

		parametric form and vice versa. ● Write rectangular equations and points in polar form and graph. ● Graph and express equations in rectangular and polar form. ● Graph and express equations in rectangular and parametric form. ● Solve application problems with parametric equations.	
7-9	Unit 10: Sequences and Series	● Use sequence, factorial and summation (sigma) notation to write the terms and sums of sequences. ● Recognize and write and use arithmetic sequences and geometric sequences and find the nth term of each of these sequences ● Find the sums of finite and infinite series ● Use sequence, factorial and summation notation to write the terms and sums of arithmetic and geometric sequences ● Write the terms and sums of sequences using factorial and	● What are the similarities and differences between finite and infinite sequences? ● How do you find the sums of arithmetic and geometric sequences both finite and infinite? ● How does the graph of an arithmetic sequence differ from the graph of a linear equation?

		summation notation. • Evaluate sums of finite and infinite series. • Write and evaluate the nth term and partial sums of sequences. • Solve application problems using sequences and series.	
8-10	Unit 11: Limits	• Determine whether a limit of a function exists • Estimate limits and use properties and operations of limits • Approximate limits of functions graphically and numerically, including one-sided limits • Find limits by direct substitution, and by using the techniques of rationalizing and dividing out. • Approximate the slopes of tangent lines, use the limit definition of slope and use derivatives to find the slopes of graphs • Evaluate limits at infinity and find limits of sequences • Find limits of functions if they	• What is meant by the term "limit"? • How are limits found? • How are limits used to find the slope of a tangent line?

		exist - Use the definition of a derivative to find the derivative of a function - Evaluate limits by direct substitution, including indeterminate form. - Calculate the slope of a tangent line and use derivatives to find the slope of graphs.	