Trigonometry CSO Prioritized Curriculum	**Essential**	**Important**	**Compact**
M.O.T.3.1 apply the right triangle definition of the six trigonometric functions of an angle to determine the values of the function values of an angle in standard position given a point on the terminal side of the angle. • determine the value of the other trigonometric functions given the value of one of the trigonometric functions and verify these values with technology. • using geometric principles and the Pythagorean Theorem, determine the six function values for the special angles and the quadrantal angles and use them in real-world problems. • compare circular functions and the trigonometric function values to draw inferences about co-terminal angles and co- functions.	**X**		
M.O.T.3.2 convert angle measures from degrees to radians (and vice versa) and apply this concept to • create a data set, analyze, and formulate a hypotheses to test and develop formulas for the arc length, area of a sector, and angular velocity and use the formula for application in the real-world. • compare and contrast the concepts of angular velocity and linear velocity and demonstrate by graphical or algebraic means relationship between them and apply to real-world problems.	**X**		
M.O.T.3.3 using various methods, basic identities and graphical representation • verify trigonometric identities • prove the sum and difference to two angles, double-angles, and half-angle identities.	**X**		
M.O.T.3.4 justify and present the solutions of trigonometric equations that include both infinite and finite (over a restricted domain) solutions.			
M.O.T.3.5 find the value of the inverse trigonometric functions using special angle trigonometric function values and technology. • draw inferences of restricted domain to recognize and produce a graph of the inverse trigonometric functions. • prove conjectures made about the solution of the equations such as x = sin (arcsin y), x = sin (arcos y) being sure to consider restrictions of the domain.	**X**		
M.O.T.3.6 identify a real life problem utilizing graphs of trigonometric functions and/or the inverse functions; make a hypothesis as to the outcome; develop, justify, and implement a method to collect, organize, and analyze data; generalize the results to make a conclusion; compare the hypothesis and the conclusion; present the project using words, graphs, drawings, models, or tables.		**X**	
M.O.T.3.7 model periodic data sets using graphs, tables, and equations and use them to analyze real-world problems such as electricity and			**X**

harmonic motion.			
M.O.T.3.8 investigate real-world problems within a project based investigation involving triangles using the trigonometric functions, the law of sines and the law of cosines, justify and present results.		**X**	
M.O.T.3.9 develop and test a hypothesis to find the area of a triangle given the measures of two sides and the included angle or the measures of three sides (Heron's formula) and use these formulas to find total area of figures constructed of multiple shapes.			**X**
M.O.T.3.10 express complex numbers in polar form: • perform operations including adding, subtracting, multiplying, and dividing; • evaluate powers and roots of complex numbers using De Moivre's Theorem; and graph complex numbers. • graph complex numbers in the polar coordinate plane and make conjectures about some polar graphs and real-world situations such as the paths that the planets travel.			**X**
M.O.T.3.11 create graphical and algebraic representations for performing vector operations and analyze these to solve real-world problems such as force analysis and navigation.		**X**	

Fayette County Schools
Mathematics Mapping Guide

Trigonometry — 1st Nine Weeks

EQ	How can properties of triangles and the unit circle be used to define, evaluate, and apply the six trig functions?	What real-world applications are there for angular velocity and for linear velocity?
Benchmark CSO's	M.O.T.3.1 apply the right triangle definition of the six trigonometric functions of an angle to determine the values of the function values of an angle in standard position given a point on the terminal side of the angle. • determine the value of the other trigonometric functions given the value of one of the trigonometric functions and verify these values with technology. • using geometric principles and the Pythagorean Theorem, determine the six function values for the special angles and the quadrantal angles and use them in real-world problems. • compare circular functions and the trigonometric function values to draw inferences about co-terminal angles and co-functions.	M.O.T.3.2 convert angle measures from degrees to radians (and vice versa) and apply this concept to • create a data set, analyze, and formulate a hypotheses to test and develop formulas for the arc length, area of a sector, and angular velocity and use the formula for application in the real-world. • compare and contrast the concepts of angular velocity and linear velocity and demonstrate by graphical or algebraic means relationship between them and apply to real-world problems.
Standards Based Math Unit		
Textbook	*Trigonometry* (McKeague, Turner) - Chapters 1, 2, 3	*Trigonometry* (McKeague, Turner) - Chapter 3
21st Century Online Resources	I Can Statements	
Lesson EQ's	1. How can you use a scientific/graphing calculator to find decimal approximations for the values of the 6 trig functions for *any* angle? 2. How can you use a calculator to find the measure of *any* angle when given the value of one of its trig functions?	1. What is the process for converting degree measure to radian measure and radian measure to degree measure? 2. How are angular velocity and linear velocity alike? How are they different? 3. How can you demonstrate the differences and similarities in angular velocity and linear velocity by graphical means and by algebraic means?

Vocabulary:

inverse operations	reference angle	calculator modes	quadrantal angle	terminal side	initial side	positive
angle	negative side	special triangles	distance formula	co-terminal angles	standard position	sine
cosine	tangent	cotangent	secant	cosecant	reciprocal identities	radian
Pythagorean identities	co-functions	significant digits	angle of elevation	angle of depression	bearing of a line	vector
static	equilibrium	force	reference angle	central angle	degree	circular
functions	even function	odd function	angular velocity	arc length	sector	linear
velocity						

Fayette County Schools
Mathematics Curriculum Map

Trigonometry — 2nd Nine Weeks

Unit EQ	How can periodic data sets be used to analyze electrical and harmonic motion?		How can combination of functions (sine and cos) be used to locate positions throughout the world?	
Benchmark CSO's	M.O.T.3.5 find the value of the inverse trigonometric functions using special angle trigonometric function values and technology. • draw inferences of restricted domain to recognize and produce a graph of the inverse trigonometric functions. • prove conjectures made about the solution of the equations such as x = sin (arcsin y), x = sin (arcos y) being sure to consider restrictions of the domain.	M.O.T.3.7 model periodic data sets using graphs, tables, and equations and use them to analyze real-world problems such as electricity and harmonic motion.	M.O.T.3.3 using various methods, basic identities and graphical representation • verify trigonometric identities prove the sum and difference to two angles, double-angles, and half-angle identities • prove the sum and difference to two angles, double-angles, and half-angle identities.	M.O.T.3.4 justify and present the solutions of trigonometric equations that include both infinite and finite (over a restricted domain) solutions.
Standards Based Math Unit			*Instructional Guide – Trigonometry – Quarter1 (Definitions and Equations)* Teach21 Instructional Guide	
Textbook	*Trigonometry* (McKeague, Turner) Chapter 4		*Trigonometry* - (McKeague, Turner) Chapter 5	
21st Century Online Resources	I Can Statements			
Lesson EQ's	1. What is the sine and cosine of an angle in standard position when the terminal side passes through a given point? 2. How can the value of a inverse trigonometric function be found using technology?	1. What advantages and disadvantages are there to modeling periodic data sets using graphs? Tables? Equations?	1. What is the difference in verifying and in proving identities? 2. What are the sum and difference formulas for sine, cosine, and tangent? 3. Why is it necessary to have sum and difference formulas for sine, cosine, and tangent?	

Vocabulary:

period amplitude domain range asymptote interval Pythagorean identitites
translations phase shift inverse rate of increase reciprocal identities ratio identities

Fayette County Schools
Mathematics Curriculum Map

Trigonometry — 3rd Nine Weeks

Unit EQ	How are equations that contain trigonometric functions utilized to solve real-world problems?	How are triangles useful in modeling situations found in the world?	
Benchmark CSO's	M.O.T.3.6 identify a real life problem utilizing graphs of trigonometric functions and/or the inverse functions; make a hypothesis as to the outcome; develop, justify, and implement a method to collect, organize, and analyze data; generalize the results to make a conclusion; compare the hypothesis and the conclusion; present the project using words, graphs, drawings, models, or tables.	MA.O.T.3.8 investigate real-world problems within a project based investigation involving triangles using the trigonometric functions, the law of sines and the law of cosines, justify and present results.	MA.O.T.3.9 develop and test a hypothesis to find the area of a triangle given the measures of two sides and the included angle or the measures of three sides (Heron's formula) and use these formulas to find total area of figures constructed of multiple shapes.
Standards-Based Math Unit	*Instructional Guide - Trigonometry Mathematics - Quarter **2*** **Teach21 Instructional Guide**		
Textbook Correlation	*Trigonometry* - (McKeague, Turner) Chapter 6	*Trigonometry* - (McKeague, Turner) Chapter 7	
21st Century Online Resources	I Can Statements		
Lesson EQ's	1. How are the algebraic properties of equality related to solving linear equations in trigonometry?	1. How are the trigonometric functions, the law of sines and the law of cosines related to real-world situations?	1. How can the area of a triangle be calculated when the measure of two sides and the included angle of the triangle are given?

Unit Vocabulary:

parameter	parametric equations	static equilibrium	heading
Heron's Formula	algebraic vectors	standard position	unit vector
scalar multiplication	dot product	magnitude	ambiguous case
work			

Fayette County Schools
Mathematics Curriculum Map

Trigonometry — 4th Nine Weeks

Unit EQ	How vectors be used to model and solve real-life problems?	When numbers and concepts cannot be represented in a traditional way, such as complex numbers, how can they be understood and analyzed?
Benchmark CSO's	M.O.T.3.11 create graphical and algebraic representations for performing vector operations and analyze these to solve real-world problems such as force analysis and navigation.	M.O.T.3.10 express complex numbers in polar form: • perform operations including adding, subtracting, multiplying, and dividing; • evaluate powers and roots of complex numbers using De Moivre's Theorem; and graph complex numbers. • graph complex numbers in the polar coordinate plane and make conjectures about some polar graphs and real-world situations such as the paths that the planets travel.
Standards Based Math Unit	*Instructional Guide* *Trigonometry Mathematics* *Quarter 3* Teach21 Instructional Guide	*Instructional Guide* *Trigonometry Mathematics* *Quarter 4* Teach21 Instructional Guide
Textbook	*Trigonometry* - (McKeague, Turner) Chapter 7 (Sections 7.5 and 7.6)	*Trigonometry* - (McKeague, Turner) Chapter 8
21st Century Online Resources	I Can Statements	
Lesson EQ's	1. What graphical representation can be used to perform vector operations? 2. How can graphical and algebraic representations be used to analyze force analysis and navigation?	1. How can complex numbers in polar form be added, subtracted, multiplied, and divided? 2. How are complex numbers graphed?

Vocabulary:

complex numbers	imaginary number	modulus	argument
Demoivre's Theorem	polar coordinates	rectangular coordinates	