Curriculum Sample Template
Max. 8 Pages

Grade Level	12th Grade	**Content Area**	Mathematics
Course Title (grades 9-12 Only)	Trigonometry		
Expected Prior Knowledge *List the knowledge/skills mastered earlier in the year foundational to the mastery of the Required Standard(s).*	Students are expected to have prior knowledge of and/or skills mastered to: **G-SRT.C.6:** Understand that by similarity, side ratios in right triangles are properties of the angles in the triangle, leading to definitions of trigonometric ratios for acute angles. **F-TF.A.1:** Understand radian measure of an angle as the length of the arc on the unit circle subtended by the angle. **F-TF.A.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.		
Alignment to Program of Instruction *Describe how the methods of instruction found in this sequence of lessons that align to the Program of Instruction described in the application package.*	Mathematics lessons focus on problem solving, critical thinking, and practical applications. Direct Instruction includes lecture (structured overview), small-group (peer partners), and teacher-directed (guided overview) learning activities. Formative assessments include didactic questioning, visual presentation of direct instruction, Cornell Notes and graphic organizers, summaries and reflections, and collaborative activities. Summative assessments designed for student mastery of content.		
Standard Number* and Description *The standard number and description of the Required Standard(s) being instructed and assessed to mastery in the curriculum sample.*	F-TF.3 Use special triangles to determine geometrically the values of sine, cosine, tangent for $\pi/3$, $\pi/4$ and $\pi/6$, and use the unit circle to express the values of sine, cosine, and tangent for $\pi-x$, $\pi+x$, and $2\pi-x$ in terms of their values for x, where x is any real number.		
Materials/Resources Needed *List all items the teacher and students will need for the entire sequence of instruction (excluding common consumables).*	Unit Circle Diagram, Math Dictionary, Scientific Calculator		

* ***Standard Number****: For English Language Arts (Reading and Writing), use Grade, Strand, Standard (e.g., 3.RI.2). For K-8 Math, use Grade, Domain, Standard (e.g., 6.EE.7). For HS Math, use Conceptual Category-Domain, Standard (e.g., A-REI.6). For Science, use Grade, Strand, Concept, PO (e.g., 4.1.3.1).*

Lesson (add as needed)	**Instructional Strategies**	**Student Activities**
1-2	**Unit Approach to Solving Trigonometric Functions** (1) Teacher will review warm-up problems to assess prior knowledge and provide re-teaching assignments as needed. (2) Teacher will introduce key vocabulary: unit approach, sine, cosine, and tangent. (3) Teacher will present structured overview of determining the sine and cosine using the unit approach for (a) functions given in radians and (b) functions given in degrees. (4) Teacher will present guided instruction to: (a) find sine and cosine for functions given in radians; (b) find the sine and cosine for functions given in degrees; and (c) find the tangent for functions by writing tangent in terms of sine and cosine.	(1) Students will access prior knowledge by using the reference angles to find the *x*- and *y*-coordinates for each point on the unit circle. (2) Students will document key vocabulary and meanings in their Math Dictionary. (3) Students will take Cornell Notes for determining the sine, cosine, and tangent using the unit approach for (a) functions given in radians and (b) functions given in degrees. (4) Students will work with peer partner to solve problems for each concept, after it is presented in guided instruction. (see Instructional Strategies 4a-c) (5) Students will complete four-six practice problems for each concept presented in the lesson. (see Instructional Strategies 4a-c)
2	**Unit Approach to Solving Trigonometric Functions** (1) Teacher will review guided instruction for finding sine, cosine and tangent. (2) Teacher will introduce key vocabulary: reciprocal functions, secant, cosecant, and cotangent. (3) Teacher will present guided instruction to: (a) find secant, cosecant, and cotangent for functions given in radians and (b) find secant, cosecant, and cotangent for functions given in degrees.	(1) **Summative Assessment:** Students will complete Sine, Cosine and Tangent Quiz. (2) Students will document key vocabulary and meanings in their Math Dictionary. (3) Students will work with peer partner to solve problems for each concept, after it is presented in guided instruction. (see Instructional Strategies 3a-c) (4) Students will complete four-six practice problems for each concept presented in the lesson. (see Instructional Strategies 3a-c)
3	**Unit Approach to Solving Trigonometric Functions** (1) Teacher will review guided instruction for finding secant, cosecant, and cotangent. **Unit Approach to Expressing Trigonometric Values** (2) Teacher will present structured overview of determining the values of sine and cosine for (a) π-*x*; (b) π+*x*; and (c) 2π-*x*. (3) Teacher will present guided instruction to: (a) find sine, cosine, and tangent for π-x; (b) find sine, cosine, and tangent for π+x; and (c) find sine, cosine, and tangent for 2π-x.	(1) **Summative Assessment:** Students will complete Secant, Cosecant and Cotangent Quiz. (2) Students will take Cornell Notes for determining the values of sine and cosine for (a) π-*x*; (b) π+*x*; and (c) 2π-*x*. (3) Students will work with peer partner to solve problems for each concept, after it is presented in guided instruction. (see Instructional Strategies 4a-c)

4	**Unit Approach to Expressing Trigonometric Values** (1) Teacher will review guided instructions for determining the values of sine and cosine expressed as π-*x*; π+*x*; and 2π-*x*.	(1) **Summative Assessment:** Students will complete Unit Circle Properties Quiz. (2) **Summative Assessment:** Students will complete the Trigonometric Functions Mathematical Applications.

Summative Assessment Items and Scoring: *Below, provide at least three Summative Assessment items that together accurately measure student mastery of the application of the content and/or skills as defined by the grade-level rigor in the Required Standard(s). For each assessment item, provide an answer key or scoring rubric which clearly describes how assessment items are to be scored and how points will be awarded, such that mastery of the application of the content and/or skills as defined by the grade-level rigor in the Required Standard is clearly demonstrated by an acceptable score.*

(1) **Sine, Cosine and Tangent Quiz:** Assessment is scored on a 75 point scale, each question is worth 5 points and partial credit may be given. Students will score 60 out of 75 points (80%) to demonstrate mastery.
(2) **Secant, Cosecant and Cotangent Quiz:** Assessment is scored on a 60 point scale, each question is worth 5 points and partial credit may be given. Students will score 48 out of 60 points (80%) to demonstrate mastery.
(3) **Unit Circle Properties Quiz:** Assessment is scored on a 60 point scale, each question is worth 5 points and partial credit may be given. Students will score 48 out of 60 points (80%) to demonstrate mastery.
(4) **Trigonometric Functions Mathematical Applications:** Assessment is scored on a 10 point scale, each question is worth 5 points and partial credit may be given. Students will score 8 out of 10 points (80%) to demonstrate mastery.*

*assessment independent from instruction

For each summative assessment item, partial credit will be awarded as follows:

5 points for correct answer and writing of ALL mathematical calculations required to solve item.
4 points for correct answer and writing of SOME but not ALL mathematical calculations required to solve item.
3 points for correct answer and no writing of mathematical calculations required to solve item.
2 points for incorrect answer and writing of ALL mathematical calculations required to solve item.
1 point for incorrect answer and writing of SOME but not ALL mathematical calculations required to solve item.
0 points for incorrect answer and no writing of mathematical calculations required to solve item.

Sine, Cosine and Tangent Quiz

Score: _____

Answer the questions below using the unit approach. Be sure to show all of your work.

1. Find the sine, cosine and tangent of $\theta = 300^{o}$.
2. Find the sine, cosine and tangent of $\theta = -225^{o}$.
3. Find the sine, cosine and tangent of $\theta = \pi / 3$.
4. Find the sine, cosine and tangent of $\theta = \pi / 4$.
5. Find the sine, cosine and tangent of $\theta = \pi / 6$.

Answer Key

1.	sine = $-\sqrt{3} / 2$	cosine = $1 / 2$	tangent = $-\sqrt{3}$
2.	sine = $\sqrt{2} / 2$	cosine = $-\sqrt{2} / 2$	tangent = -1
3.	sine = $\sqrt{3} / 2$	cosine = $1 / 2$	tangent = $\sqrt{3}$
4.	sine = $\sqrt{2} / 1$	cosine = $\sqrt{2} / 2$	tangent = 1
5.	sine = $1 / 2$	cosine = $\sqrt{3} / 2$	tangent = $\sqrt{3}$

Secant, Cosecant and Cotangent Quiz

Score: _____

Answer the questions below using the unit approach. Be sure to show all of your work.

1. Find the secant, cosecant and cotangent of $\theta = 120^{o}$.
2. Find the secant, cosecant and cotangent of $\theta = \pi / 3$.
3. Find the secant, cosecant and cotangent of $\theta = \pi / 4$.
4. Find the secant, cosecant and cotangent of $\theta = \pi / 6$.

Answer Key

1.	secant = -2	cosecant = $2\sqrt{3} / 3$	cotangent = $-\sqrt{3} / 3$
2.	secant = $2\sqrt{3} / 3$	cosecant = 2	cotangent = $\sqrt{3} / 3$
3.	secant = $\sqrt{2} / 2$	cosecant = $2\sqrt{2} / 2$	cotangent = 1
4.	secant = 2	cosecant = $2\sqrt{3} / 3$	cotangent = $\sqrt{3} / 3$

Unit Circle Properties Quiz

Score: _____

Complete the chart to identify the values of sine, cosine, and tangent. Indicated the quadrant in which triangles may be found for these values.

	Sine	Cosine	Tangent	Quadrants
π-x				
π+x				
2π-x				

Answer Key

	Sine	Cosine	Tangent	Quadrants
π-x	positive	negative	negative	II
π+x	negative	negative	positive	III
2π-x	negative	positive	negative	IV

Trigonometric Functions Mathematical Applications

Score: _____

Answer the question and provide mathematical evidence to support your answer. Be sure to show all of your work.

1. Given ∆ABC is right angled at B and ∠ACB = π / 3, If AC = 10, Find AB.
2. Given ∆ABC is right angled at B and ∠ACB = π / 4, If BC = 3, Find AC.

Answer Key

1. AB = $5\sqrt{3}$
2. AC = $3\sqrt{2}$