

ABSS Math Unit Planning Template

Introduction:

Grade/Course: 9_12 Adv Functions and Modeling		Suggested Unit Pacing (# of days): 9	
Unit Number and Title: Unit 5 - The Trigonometric Functions		Mathematical Practices	
Conceptual Overview	This unit reviews angles and angle measurement in degrees and begins to build the relationships with trigonometric functions through examining trigonometric ratios. Trigonometric functions are used to investigate the relationship of sides and angles of right triangles through the use of the Law of Sines and Law of Cosines. Areas of triangles are also evaluated.	P1	Make sense of problems and persevere in solving them.
		P2	Reason abstractly and quantitatively.
		P3	Construct viable arguments and critique the reasoning of others.
		P4	Model with mathematics.
		P5	Use appropriate tools strategically.
		P6	Attend to precision.
		P7	Look for and make use of structure.
		P8	Look for and express regularity in repeated reasoning.
Essential Understandings			
SCS	The learner will use functions to solve problems.	<u>SCS.9 12.MA.2.04</u>	Use trigonometric (sine, cosine) functions to model and solve problems; justify results.
SCS	The learner will use functions to solve problems.	<u>SCS.9 12.MA.2.04.b</u>	Create and identify transformations with respect to period, amplitude, and vertical and horizontal shifts.
SCS	The learner will use functions to solve problems.	<u>SCS.9 12.MA.2.04.c</u>	Develop and use the law of sines and the law of cosines.
CCSS	Trigonometric Functions	<u>CCSS.9 12.MA.F.TF.CL1</u>	Extend the domain of trigonometric functions using the unit circle
CCSS	Trigonometric Functions	<u>CCSS.9 12.MA.F.TF.1</u>	Understand radian measure of an angle as the length of the arc on the unit circle subtended by the angle.
CCSS	Trigonometric Functions	<u>CCSS.9 12.MA.F.TF.2</u>	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.
CCSS	Trigonometric Functions	<u>CCSS.9 12.MA.F.TF.3</u>	(+) 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.
CCSS	Trigonometric Functions	<u>CCSS.9 12.MA.F.TF.4</u>	(+) Use the unit circle to explain symmetry (odd and even) and periodicity of trigonometric functions.
CCSS	Trigonometric Functions	<u>CCSS.9 12.MA.F.TF.CL2</u>	Model periodic phenomena with trigonometric functions
CCSS	Trigonometric Functions	<u>CCSS.9 12.MA.F.TF.5</u>	Choose trigonometric functions to model periodic phenomena with specified amplitude, frequency, and midline. ★

CCSS	Trigonometric Functions	<u>CCSS.9 12.MA.F.TF.9</u>	(+) Prove the addition and subtraction formulas for sine, cosine, and tangent and use them to solve problems.	
Learning Targets	<ul style="list-style-type: none"> • Convert decimal degree measures to degrees, minutes, and seconds and vice versa • Identify angles that are coterminal with a given angle • Solve triangles • Find the values of trigonometric functions • Find the areas of triangles 			
Essential Terminology	<ul style="list-style-type: none"> • ambiguous case • angle of depression • angle of elevation • apothem • cosine • sine • tangent • trigonometric function • trigonometric ratio • coterminal angle • initial side • terminal side • standard position • unit circle • Law of Sines • Law of Cosines • degree • minute • second • hypotenuse • adjacent side • opposite side • reference angle • quadrantal angle • Heron's Formula • vertex 			
Literacy Integration	Literacy Standards	Level	Standard	Standard Name
	Literature Connections			
Technology Integration	Technology Standards	Level	Standard	Standard Name
	Websites			
Assessment	Formative			
	Performance Tasks			
	Summative			
Resources				
Learning Plan	Instructional Sequence	<ul style="list-style-type: none"> • Angles and Degree Measure (5-1) • Trigonometric Ratios in Right Triangles (5-2), Solving Right Triangles (5-5) • Trigonometric Functions on the Unit Circle (5-3) • Applying Trigonometric Functions (5-4) • Review and Formative Assessment • The Law of Sines (5-6) • The Law of Cosines (5-8), Solving Oblique Triangles (5-8) • Review • Assessment 		
Differentiation	Remediation			
	Enrichment			