

ABSS Math Unit Planning Template

Introduction:

Grade/Course: 9_12 Adv Functions and Modeling		Suggested Unit Pacing (# of days): 8	
Unit Number and Title: Unit 7 - Vectors and Parametric Equations		Mathematical Practices	
		P1	Make sense of problems and persevere in solving them.
Conceptual Overview This unit introduces vector notation; vector addition, subtraction, and multiplication; cross products; and parametric equations.		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	
CCSS		<u>CCSS.9 12.MA.N.VM</u>	Vector and Matrix Quantities
CCSS	Vector and Matrix Quantities	<u>CCSS.9 12.MA.N.VM.CL1</u>	Represent and model with vector quantities.
CCSS	Vector and Matrix Quantities	<u>CCSS.9 12.MA.N.VM.1</u>	(+) Recognize vector quantities as having both magnitude and direction. Represent vector quantities by directed line segments, and use appropriate symbols for vectors and their magnitudes (e.g., \mathbf{v} , $ \mathbf{v} $, $\ \mathbf{v}\ $, v).
CCSS	Vector and Matrix Quantities	<u>CCSS.9 12.MA.N.VM.2</u>	(+) Find the components of a vector by subtracting the coordinates of an initial point from the coordinates of a terminal point.
CCSS	Vector and Matrix Quantities	<u>CCSS.9 12.MA.N.VM.3</u>	(+) Solve problems involving velocity and other quantities that can be represented by vectors.
CCSS	Vector and Matrix Quantities	<u>CCSS.9 12.MA.N.VM.CL2</u>	Perform operations on vectors.
CCSS	Vector and Matrix Quantities	<u>CCSS.9 12.MA.N.VM.4</u>	(+) Add and subtract vectors.
CCSS	Perform operations on vectors.	<u>CCSS.9 12.MA.N.VM.4.a</u>	Add vectors end-to-end, component-wise, and by the parallelogram rule. Understand that the magnitude of a sum of two vectors is typically not the sum of the magnitudes.
CCSS	Perform operations on vectors.	<u>CCSS.9 12.MA.N.VM.4.b</u>	Given two vectors in magnitude and direction form, determine the magnitude and direction of their sum.
CCSS	Perform operations on vectors.	<u>CCSS.9 12.MA.N.VM.4.c</u>	Understand vector subtraction $\mathbf{v} - \mathbf{w}$ as $\mathbf{v} + (-\mathbf{w})$, where $-\mathbf{w}$ is the additive inverse of \mathbf{w} , with the same magnitude as \mathbf{w} and pointing in the opposite direction. Represent vector subtraction graphically by connecting the tips in the appropriate order, and perform vector subtraction

			component-wise.	
CCSS	Vector and Matrix Quantities	<u>CCSS.9 12.MA.N.VM.5</u>	(+) Multiply a vector by a scalar.	
CCSS	Vector and Matrix Quantities	<u>CCSS.9 12.MA.N.VM.CL3</u>	Perform operations on matrices and use matrices in applications.	
CCSS	Perform operations on vectors.	<u>CCSS.9 12.MA.N.VM.5.a</u>	Represent scalar multiplication graphically by scaling vectors and possibly reversing their direction; perform scalar multiplication component-wise, e.g., as $c(v_x, v_y) = (cv_x, cv_y)$.	
Learning Targets	<ul style="list-style-type: none"> • Add, subtract, and multiply vectors. • Represent vectors as ordered pairs or ordered triples and determine their magnitudes. • Write and graph vector and parametric equations. • Solve problems using vectors and parametric equations. 			
Essential Terminology	<ul style="list-style-type: none"> • magnitude • standard position • direction • zero vector • equality of vectors • resultant • vector opposites • scalar quantity • scalars • parallel • components • unit vector • perpendicular vectors • cross product • vector equation • parametric equation • direction vector • parameter • dot product 			
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"> • Geometric Vectors (8-1) • Algebraic Vectors (8-2) • Vectors in Three-Dimensional Space (8-3), Perpendicular Vectors (8-4) • Applications with Vectors (8-5) • Vectors and Parametric Equations (8-6) • Modeling Motion Using Parametric Equations (8-7) • Review • Assessment 		
Differentiation	Remediation			
	Enrichment			