Unit 14: Vectors

Content Area: **Mathematics**
Course(s): **PreCalc Trig H**
Time Period: **Semester 2**
Length: **3 days**
Status: **Published**

Standards - NJCCS/CCSS

CCSS.Math.Content.HSN-VM.A.1	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., $\boldsymbol{v}$, $\lvert\boldsymbol{v}\rvert$, $\lVert\boldsymbol{v}\rVert$, v).
CCSS.Math.Content.HSN-VM.A.2	Find the components of a vector by subtracting the coordinates of an initial point from the coordinates of a terminal point.
CCSS.Math.Content.HSN-VM.B.4.a	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.Math.Content.HSN-VM.B.4.b	Given two vectors in magnitude and direction form, determine the magnitude and direction of their sum.
CCSS.Math.Content.HSN-VM.B.4.c	Understand vector subtraction $\boldsymbol{v} - \boldsymbol{w}$ as $\boldsymbol{v} + (-\boldsymbol{w})$, where $-\boldsymbol{w}$ is the additive inverse of $\boldsymbol{w}$, with the same magnitude as $\boldsymbol{w}$ 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.Math.Content.HSN-VM.B.5	Multiply a vector by a scalar.

Enduring Understandings

Vectors are used to represent many physical characteristics.

Essential Questions

What is a vector?

How do we add vectors?

What is a scalar?

How do we calculate the dot product between vectors?

How does a unit vector compare to a general vector?

What property exists between perpendicular (normal) vectors?

What property exists between parallel vectors?

Knowledge and Skills

SWBAT add and subtract vectors.

SWBAT rewrite a vector in component form.

SWBAT calculate the "dot product" of two vectors.

SWBAT write the unit vector in the same direction as another vector.

SWBAT determine if vectors are parallel or perpendicular (normal).

Resources

Precalculus with Limits

Authors: Aufmann, Barker, Nation

Graphing Calculator

www.desmos.com

www.flipgrid.com

www.graphfree.com