

Unit 1: Where are we- Vectors and Projectiles

Content Area: **Science**
Course(s): **Physics Honors, Horticulture 1**
Time Period: **September**
Length: **4 weeks**
Status: **Published**

Transfer

Vectors and Projectiles-to understand the concepts and problem solving for two dimensional motion

Enduring Understandings

Vectors are the key to navigation.

Projectile motion is both horizontal and vertical motion. These two motions are independent of one another and are analyzed separately.

Essential Questions

How are vectors used?

Why are there differences between vector and scalar quantities?

How does an object move in two dimensions?

Content

Vocabulary

Projectile

Trajectory

Resultant

Equilibrium

Learning Objectives

Create a vector given parameters.

Add and subtract vectors using the two methods.

Determine resultant vectors using two methods.

Determine the equilibrant for a system in/not in equilibrium.

Apply vector calculations to Newton's Laws of Forces.

Use vector analysis to determine headings and velocities in Navigation problems.

Use vectors to determine relative velocities in Navigation problems.

Separate horizontal and vertical components of motion.

Understand and apply principles of gravitational effects on an object in projectile motion.

Apply trigonometric functions to separate horizontal and vertical components of velocity.

Standards

SCI.9-12.5.1.12	All students will understand that science is both a body of knowledge and an evidence-based, model-building enterprise that continually extends, refines, and revises knowledge. The four Science Practices strands encompass the knowledge and reasoning skills that students must acquire to be proficient in science.
SCI.9-12.5.1.12.A	Students understand core concepts and principles of science and use measurement and observation tools to assist in categorizing, representing, and interpreting the natural and designed world.
SCI.9-12.5.1.12.A.3	Use scientific principles and theories to build and refine standards for data collection, posing controls, and presenting evidence.
SCI.9-12.5.1.12.B	Students master the conceptual, mathematical, physical, and computational tools that need to be applied when constructing and evaluating claims.
SCI.9-12.5.1.12.B.1	Design investigations, collect evidence, analyze data, and evaluate evidence to determine measures of central tendencies, causal/correlational relationships, and anomalous data.
SCI.9-12.5.1.12.B.2	Build, refine, and represent evidence-based models using mathematical, physical, and computational tools.
SCI.9-12.5.2.12	All students will understand that physical science principles, including fundamental ideas about matter, energy, and motion, are powerful conceptual tools for making sense of phenomena in physical, living, and Earth systems science.
SCI.9-12.5.2.12.E	It takes energy to change the motion of objects. The energy change is understood in terms of forces.
SCI.9-12.5.2.12.E.1	Compare the calculated and measured speed, average speed, and acceleration of an object in motion, and account for differences that may exist between calculated and measured values.

Assessments

Quizzes

Formative: Other Evidence:Other: Quiz

Vector Problems

Vectors-mapping the school

Formative: Other Evidence:Performance: Lab Assignment

Lab Activity

Vectors II

Formative: Other Evidence:Performance: Lab Assignment

Lab Activity

Projectiles- case 1

Formative: Other Evidence:Performance: Lab Assignment

Lab Activity

Projectiles- case 2

Formative: Other Evidence:Performance: Lab Assignment

Lab Activity

Projectiles-case 3

Formative: Other Evidence:Performance: Lab Assignment

Lab Activity

Great adventure lab-The batman & The flying wave

Formative: Other Evidence:Performance: Lab Assignment

Lab Activity

Chapter Test

Summative: Transfer Tasks: Test: Common

Theory and Vector Problems

