

Force

Enduring Understanding - A net force is required to change an object's velocity; no force is required to explain constant velocity.

BOLD lined boxes mean Pre-AP ONLY

2D Motion

Application of Constant Motion, Changing Motion, and Newton's First and Second Laws to Projectiles (Previous Unit)

Newton's Laws

Three laws of motion that govern the study of Mechanics.

UCM and Gravity

Application of Newton's Second and Third Laws to Circular Motion and Gravitational Force (Next Unit)

Essential Question
Can $1 + 1 \neq 2$?

Essential Question
What happens when a force is applied to an object?

Essential Question
How are all the forces acting on an object illustrated?

Essential Question
How can objects experience a frictional force?

Essential Question
Is the sum of all the forces in the universe an odd or even number?

Vectors

Relative Motion

Newton's First Law of Motion

Newton's Second Law of Motion

Friction

Newton's Third Law

Graphical Vector Addition

Analytical Vector Addition

Law of Inertia

Examining Graphs of Motion for:
Constant Motion
Changing Motion
Balanced Forces
Unbalanced Forces

Free-Body Diagrams (Rock Worksheets)

Force of Gravity = F_g
Weight
 $F_g = mg$

Friction Lab

Horse and Cart

Head-to-Tail Method

Right Angle Vector Addition

Resolve Vectors into Components

Essential Question
How is net force identified on graphs of motion?

Newton's Second Law Lab

Kinetic Friction
 $F_{\text{friction}} = \mu_k F_N$

Static Friction
 $F_{\text{friction}} \leq \mu_s F_N$

Pythagorean Theorem

$F_x = F \cos \theta$
 $F_y = F \sin \theta$

Balanced Forces
 $\Sigma F = F_{\text{net}} = 0$

Unbalanced Forces
 $\Sigma F = F_{\text{net}} = ma$

Friction Problem

Elevator Scenarios

Elevator Scenarios

Elevator Problem



GravityKills