



## Unit 3 Forces and Motion

### High School Physical Science

#### Unit Length and Description:

#### 5 Instructional Weeks

Students will analyze data to support Newton's 2<sup>nd</sup> Law of Motion and describe the mathematical relationship among an object's net force and mass. They will also use mathematical representations to support the claim of Conservation of Momentum. Students will apply science and engineering ideas to design, evaluate, and refine a device that minimizes the force on an object during a collision.

#### Science Standards:

- HS-PS2-1** Analyze data to support the claim that Newton's second law of motion describes the mathematical relationship among the net force on a macroscopic object, its mass, and its acceleration.
- HS-PS2-2** Use mathematical representations to support the claim that the total momentum of a system of objects is conserved when there is no net force on the system.
- HS-PS2-3** Apply scientific and engineering ideas to design, evaluate, and refine a device that minimizes the force on a macroscopic object during a collision.

#### Enduring Understandings- Unit Anchor Phenomenon:

Reducing forces on passengers during a potential crash is a primary design challenge when designing a car.

#### Essential Questions- Reflective Summaries:

- Make a claim that Newton's second law of motion describes the mathematical relationship among the net force on a macroscopic object, its mass, and its acceleration.
- Use mathematical representations to support the claim that the total momentum of a system of objects is conserved when there is no net force on the system.
- Design a device that minimizes the force on a macroscopic object during a collision.