

## Elementary Physics: Mechanics

Students will learn about Newton's law and kinematics. They will explore mass, speed, velocity, acceleration, inertia, friction, and forces. Each class begins with a brief lesson, demonstrations, and includes one or more hands-on activities and experiments on projectile motion, friction and Newton's laws of motion. Course themes include: kinematics, forces, mass, speed, velocity, acceleration, gravity, vectors and scalars, and units of measure.

### Week 1: Introduction and Matter

- Introduction to Physics and the different areas of Physics
- States of matter
- Matter: Mass, weight, density
- Properties of matter

### Week 2: Inertia

- Understanding of motion before Newton – Aristotle, Copernicus and Galileo
- Introduction to Newton's First Law of Motion

### Week 3: Forces

- Net force
- Equilibrium: Mechanical equilibrium and equilibrium of moving objects
- Normal force

### Week 4: Speed and Velocity

- Introduction to the relativity of motion
- Speed: Average speed and instantaneous speed
- Velocity and relationship to speed

### Week 5: Acceleration

- Introduction to acceleration
- Acceleration on inclined planes
- Falling objects and gravity

### Week 6: Friction

- Introduction to friction
- Mass and weight and relationship to acceleration
- Newton's Second Law of Motion

### Week 7: Newton's Third Law of Motion

- Forces and the interaction between them
- Newton's Third Law of Motion