

## **Motion Demonstration:**

**Explore Newton's Three Laws in this exciting, hands-on demonstration. Students will better understand motion, acceleration, speed and gravity by the time their visit is through!**

### **Demonstration highlights include:**

#### **What is motion?**

Students learn that motion is a change in position of one object in relation to another object.

#### **Objects fall at the same rate**

Galileo's famous experiments are used to show that all objects fall at the same rate.

#### **Air Resistance**

Discover how air resistance affects the speed of a falling object.

#### **Newton's First Law- Inertia**

Explore through some exciting challenges how inertia can be used to your advantage.

#### **Newton's Third Law**

Explore action and reaction with rockets and flying balloons. A demonstration that will be hard to forget!

### **Content Standards Alignment:**

#### **Ohio Content Standards Alignment**

##### **Grades 3-5**

Physical Science: C

Earth and Space Science: A

##### **Grades 6-8**

Physical Science: B

Earth and Space Science: A

#### **Michigan Curriculum Framework Alignment Science**

Strand I. Constructing New Scientific Knowledge

Standard I.I Constructing New Scientific Knowledge

Strand IV. Using Scientific Knowledge in Physical Science

Standard IV.3 Motion of Objects

## **Post-Activity:**

### **Planet Pop**

#### **Materials:**

Sand

Pop cans (1 full can and 3 clean, empty cans)

Scale

Data Recording Sheet

#### **Procedure:**

1. Using the scale, record how much a full can of pop weighs.
2. On Jupiter, the amount of gravity is 2.5 times more than that of Earth. Calculate how much a can of pop would weigh on Jupiter and use the scale to determine the exact weight of sand to add to an empty can.
3. Neptune has 1.2 times more gravity than Earth. Calculate how much a can of pop would weigh on Neptune and use the scale to determine the exact weight of sand to add to the empty can.
4. Pluto has 17 times less gravity than Earth. Calculate how much a can of pop would weigh on Pluto and use the scale to determine the exact weight of sand to add to the empty can.
5. Take turns picking up pop cans and feeling the difference.
  - Locate Jupiter, Neptune and Pluto in the solar system.
  - How does the location in our solar system affect gravitational pull?
  - Approximately how much would you weigh on Pluto?

#### **What's the science?**

The acceleration of an object due to gravity on earth is  $9.8 \text{ m/s}^2$ . This is earth's gravitational pull. Jupiter, Neptune and Pluto have different gravitational pulls. The larger the pull of gravity, the more the object (the paper) is pulled down, giving a greater weight.

#### **Answers:**

Jupiter: 12 oz. can on Earth multiplied by 2.5 equals 30 oz.

Neptune: 12 oz. can on Earth multiplied by 1.2 equals 14.4 oz.

Pluto: 12 oz. can divided by 17 equals 0.7059 oz.