Soaring Oklahoma

Presented by

OKLAHOMA AERONAUTICS COMMISSION

AEROSPACE & DEFENSE

Lesson 2: Newton's Second Law of Motion

In order for an object to accelerate, an outside force must act upon it. The greater the mass of an object, the more force it will take to put the object in motion. Newton's law of acceleration indicates that an increase in mass or acceleration will equal an increase in object force.

The following formula is used to calculate FORCE

Force = Mass x Acceleration

This equation can also be changed to calculate ACCELERATION

Acceleration = Force / Mass

Things you should know:

- Mass is the quantity of matter that an object is made up of.
- Force is the strength or power of a motion. There are two types of force, contact force (i.e. when a baseball bat connects with a baseball) and distance force (i.e. when a ball is dropped from up high and gravity acts on the ball producing a downward motion).
- Motion is a change in an objects position.
- Acceleration is the rate of change in velocity, or speed.

MATERIALS:

- Ruler with a crease in the middle
- Masking tape
- Large marble
- Small marble
- Two meter sticks
- Small foil pan

PROCEDURE:

Watch the following youtube video for directions on how to create your marble ramp: https://www.youtube.com/watch?v=0hcnQ5xkZ-k

Place the large marble between the two yard sticks at the base of the ruler. Use the ruler ramp to release the small marble into the large marble. How far did the large marble travel?

Test #1 _____

Test #2 _____

Test #3 _____

Place the small marble between the two yard sticks at the base of the ruler. Use the ruler ramp to release the large marble into the small marble. How far did the small marble travel?

Test #1 _____

Test #2 _____

Test #3 _____

CLASSROOM DISCUSSION:

In which scenario did the marble travel farther? Why is that?