Easy as 1-2-3: Newton's 3 Laws of Motion

ACTIVITY LAB

Name: _____ Date submitted: _____
Grade Level/Section: _____ Score: _____

Learning Objectives: At the end of this activity, the learners are expected to:

- be able to understand how Newton's three laws of motion works.
- perform and demonstrate simple activities on the Newton's three laws of motion.
- experience real life examples of Newton's three laws of motion.

Directions: Perform the following activities in a group with 4-5 members. Record all the necessary data and answer the guide questions.

A CURIOUS COIN: NEWTON'S FIRST LAW

Materials: plastic cup, index card, coin

Procedure:

1. Set the plastic cup on a flat surface and place the index card on top.
2. Position the coin in the center of the index card.
3. Quickly flick the card to shoot off the coin into the cup.
4. Continue until the coin drops into the cup.

Observations:

Questions:

1. What happened to the coin when the card slid out from underneath it?
   _____
   _____.
2. What do you think is the force that acted on the card to set it in motion?
   _____
   _____.
3. What force acted on the coin after step 3?
   _____
   _____.
4. Why does the coin fall into the cup?
   _____.
5. How is this related to inertia?
   _____.

WHO'S FASTER? : NEWTON'S SECOND LAW

Materials: A board (about 2 m long), toy car, modeling clay, measuring tape, timer, weighing instrument.

Procedure:

1. Lay a board about 2 meters long in the floor.
2. Lift the end of the board with a specific height.
3. Measure the initial mass of the toy car. Record the data.
4. Place the car in the elevated part of the board. Release the car until it begins to move. Record the time the toy car reaches the end of the board.
5. Next, press a piece of modeling clay on the top of the car to increase its mass. Record the new mass of the car. Repeat step 4.
6. Predict how adding a second piece of clay to the top of the toy car affects its mass.
7. Test your prediction and record your data.

Observations:

Questions:

1. Which mass of the car has the longest time to reach the end of the board? Which has the shortest time?

_____

_____.

2. What happens when you add more clay on the top of the toy car?

_____

_____.

3. Which causes more acceleration, a small or huge force? How do acceleration and force relate?

_____

_____.

4. What does Newton's second law describe?

_____

_____.

5. Explain the relationship between mass and acceleration.

_____

_____.

BALLOON ROCKET: NEWTON'S THIRD LAW

Materials: long string, balloon, tape, marker, straws, small box for "cargo", Cargo (paper clips, bottle caps, candy, etc.)

Procedure:

1. Tie one end of a string to a chair, doorknob, or other support.

2. Put the other end of the string through a straw. Then pull the string tight, and tie it to another support in the room.

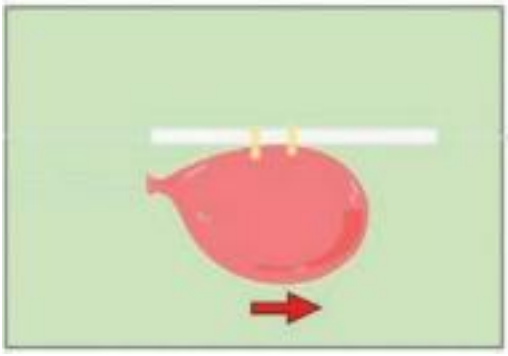
3. Blow up the balloon, and pinch the end of the balloon to keep the air inside. Do not tie the balloon.

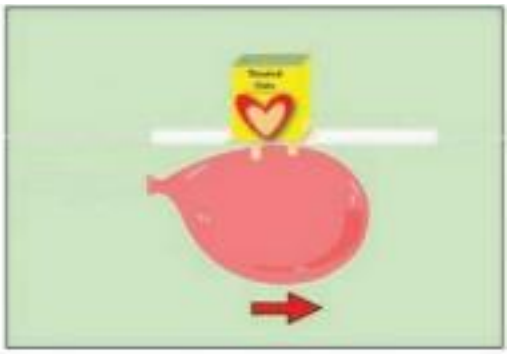
4. Tape the balloon to the straw so that the opening of the balloon is horizontal with the ground. You may need two students for this: one to keep the air pinched inside the balloon and the other to tape the balloon to the straw.

5. Have one student pull the balloon all the way back to the end of the string (the starting line), so the balloon opening is against one support. That student should hold the balloon opening closed. Have another student use the marker to draw a finish line near the other end of the string.

6. Let go of the balloon and watch it move along the string.

7. Then, have students test different methods to transport "cargo" across the string to the finish line.





Observations:

Questions:

1. What happened when the opening of the balloon was released and the gas was allowed to escape?

_____

_____.

2. Once you have the balloon set, what causes this to happen?

_____

_____.

3. What do you think will cause the balloon to move quickly?

_____

_____.

4. What happens when you add cargo to the balloon rocket?

_____

_____.

5. Is your hypothesis in question number 4 valid? Why or why not? If not, what would be your next steps?

_____

_____.