Activity 4

# Observe Like a Scientist

## What Do You Already Know About Starting and Stopping?

**Share** what you already know about starting and stopping by completing the following activities. After you have learned more, you can return to these activities to add to or change your responses.

### How Do Objects Move?

Pushes and pulls move objects. **Write** one sentence that describes pushing something. **Write** a second sentence that describes pulling something.

### Balanced and Unbalanced

**Observe** the image, which shows a rope being pulled in two directions. The rope is not moving in the image, but which way do you think it moved just after the image was taken? **Record** your prediction by drawing an arrow beneath the image. Then, turn to a partner and **discuss** your answers.

Children Playing Tug-of-War

## How Do We Know an Object Is Moving?

Activity 5

# Analyze Like a Scientist

## Objects in Motion

Read the text, then **answer** the questions that follow.

### Objects in Motion

Think of a time when you played catch with a friend. The ball left your hands, travelled through the air, and then was caught by your friend. The ball landed in a different place from where it started, because it moved.

An object is in motion if it is moving from one place to another. When you look at an object, you can describe its position compared to other things around it. Imagine that you are standing next to a tree when you are playing catch. The starting position of the ball is close to the tree. When the ball travels through the air, it is in motion. It stops moving when your friend catches it. The ball's position changes, relative to the tree. Motion is any change in position relative to a fixed starting point.

What causes motion to start? For motion to start or stop, there must be a force, a push or a pull. When you threw the ball, you put it into motion using a push. **Gravity**, the force that pulls objects downward, caused the ball to drop into your friend's hand. The pushing force of your friend's hand against the ball stopped the ball's motion.

Some motion is easy to see, and some is not. It is easy to see a person walk down the street, a leaf blowing in the wind, or a ball traveling through the air after it is thrown. You know an object is in motion if you can measure changes in its position, even if you cannot see those changes. An object's change in position is compared to something else, usually something that is not moving.



What two things must occur for a ball to be in motion?

What are the two types of forces that can be used to put a ball into motion?

**Life Skills** **I can analyze a situation.**

## What Makes Objects Move?

Activity 6

# Observe Like a Scientist

## Force

Two types of force put objects in motion: push and pull. Examples of these forces are around you everywhere you go. **Read** the text, if possible. **Look** for examples of pushes and pulls. Then, **answer** the questions that follow.

Photo Credit: (a) inigolai-Photography / Shutterstock.com, (b) Ihor Berkyta / Shutterstock.com
Photo Credit: inigolai-Photography / Shutterstock.com

Every day, the world around us is in constant motion. Vendors push carts through busy markets, kids play football games, you travel to school and return home again. Some things move quickly, while others move slowly. All motion, fast or slow, is caused by force. Force is a push or pull on an object that causes it to change position.

Does force affect us when it feels like we are not in motion? If you are reading this, you are probably sitting in a chair. It may not feel like there is any force acting on your body. In fact, gravity is pulling you downward and holding you in the chair.

When you finish your work, you might push the chair away from your desk and pull your bag up from the floor. Did you know that in these movements, multiple forces are acting from different directions? Gravity pulls your bag down while your arm lifts it up. A key part of understanding motion is to recognize balanced and unbalanced forces.

Have you ever played tug-of-war? Two teams hold opposite ends of a rope. The players pull the rope toward them. If each team is pulling the rope with equal force, the forces are balanced. Neither team moves forward. If one team pulls with greater force, then the forces are unbalanced and the rope moves.

What are some examples of starting or stopping motion with a push? _____

What are some examples of starting or stopping motion with a pull? _____

Think about a time that you used force. What would that activity be like if there was no push or pull involved? _____

**Life Skills** **I can identify problems.**