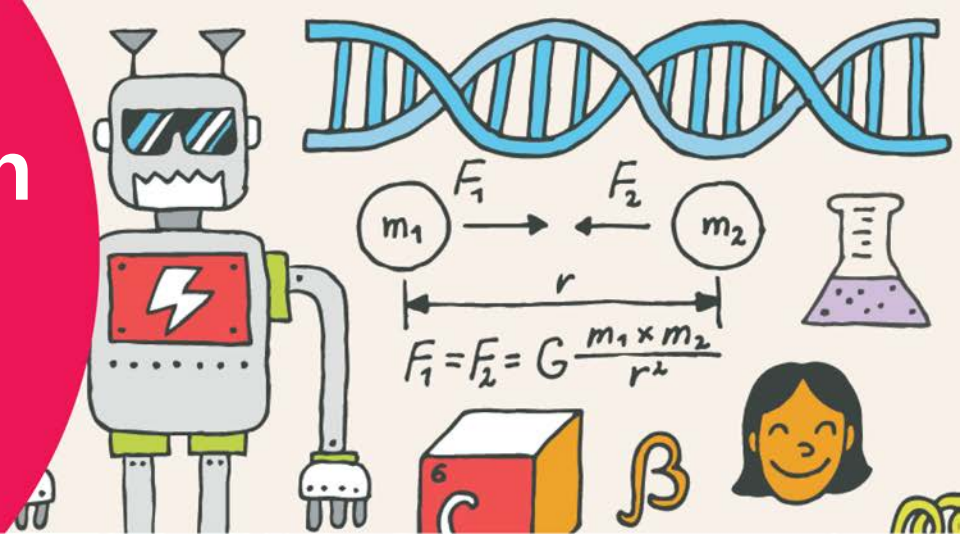
Forces in Action

Activities to engage young minds before and after your museum visit



BEFORE YOUR VISIT

Ice-Breaker Activity: Are you stronger than gravity?

Materials

- Straws
- Ping pong balls

Instructions

1. Divide the class into groups. Each student receives one straw.
2. Instruct the students to create enough suction with the straw to lift the ping pong ball, and pass it around the group without dropping it. The first group to finish wins the challenge!

What happened?

The force of suction was greater than the force of gravity pulling down on the ping pong ball. Would you be able to do the same activity with a golf ball? Why not?

The science behind the activity
Gravity is the force that pulls objects together. Every object that has mass possesses gravitational attraction, even an apple! The more massive an object is, say the Earth, the greater its gravitational attraction. The Sun's gravity attracts the Earth and planets. The pull of gravity is what keeps the planets and other solar system objects in their orbits around the Sun.

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CANADA SCIENCE AND TECHNOLOGY MUSEUM
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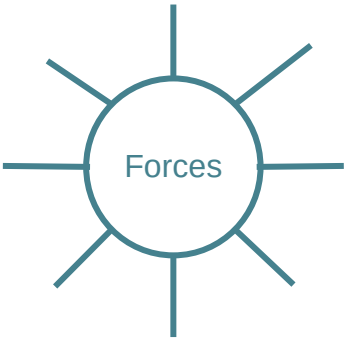
Brainstorming Activity: What are forces?

Draw a quick brainstorm diagram on the board about forces. This will help assess students' prior knowledge.

Can anyone tell me what a force is?

When you think of forces, what is the first thing that comes to mind?

Discuss what forces students encounter in everyday life. Classify them as "pushes" or "pulls."



AFTER YOUR VISIT

Activity: Classifying Forces

Introduction

A few days in advance, ask students to bring a toy/device that moves to school.

Examples of extra items to have on hand to ensure a variety of mechanisms:

Pull-string toy   	**Wind-up toy**   
Ball (throw, bounce, kick, roll, etc.)   	**Rolling toy**   
Battery-operated toys   	**Others (mechanical, spinning)**   

Modelling

Start the class by presenting a demonstration toy (preferably one that is different from what the students have brought).

Guiding questions:

- How does this toy/object work?
- Can you describe the way it moves?
- What forces are allowing it to move?
- Does your toy push, pull, do both, or do neither?
- Do you need to touch your toy to make it move?
- Which force(s) does your toy use to move (gravity, magnetic, muscular, electrostatic, batteries)?
- What type of movement does your toy make (bounces, rolls, wobbles, flies, spins, slides, twists, etc.)?
- How fast does it move (fast, medium, slow)?

On the board, draw a quick sketch of the toy and describe how it moves using arrows and key vocabulary words.

Teamwork

Students will now work in teams of two to identify and describe how their toys move, and the forces involved. (Guiding questions can be written on the board.)

Ask students to draw a quick sketch of their toy and identify how it moves.

Share

Invite students to share their work with the class.

When a student has a toy that requires a specific type of force (i.e. pulling), ask the class if anyone else has a similar toy, then compare toys. Toys can be classified using a Venn diagram (on the board, on paper, or on the floor using large hula hoops).