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Understanding Life Systems

Students will investigate a variety of plants and study their basic structure and characteristics. They will also learn about how plants interact with animals and how different plants pollinate and disperse seeds. The growth of plants and the germination of seeds will also be discussed. Students will also study how plants adapt to their environments and how humans make use of plants for food and products. Moreover, they will explore the impacts of human activities and environmental conditions on plant life.

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Understanding Structures and Mechanisms

Students will understand that both humans and animals build structures and need their structures to be strong and stable. They will investigate the factors that affect a structure's strength and stability, and learn to identify the centre of gravity in structures. They will apply their knowledge to design and build strong and stable structures using suitable materials. Moreover, they will study the different types of bridges, and see how structures affect our society.

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Section 3

Understanding Matter and Energy

Students will develop an understanding that there are two basic types of forces that cause movement: contact force and non-contact force. They will learn about ways in which forces cause objects to move and that movement is caused by unbalanced forces. They will explore what friction is, how it occurs, and how much of it is required in different activities. In addition, students will examine devices that use forces to create controlled movement.

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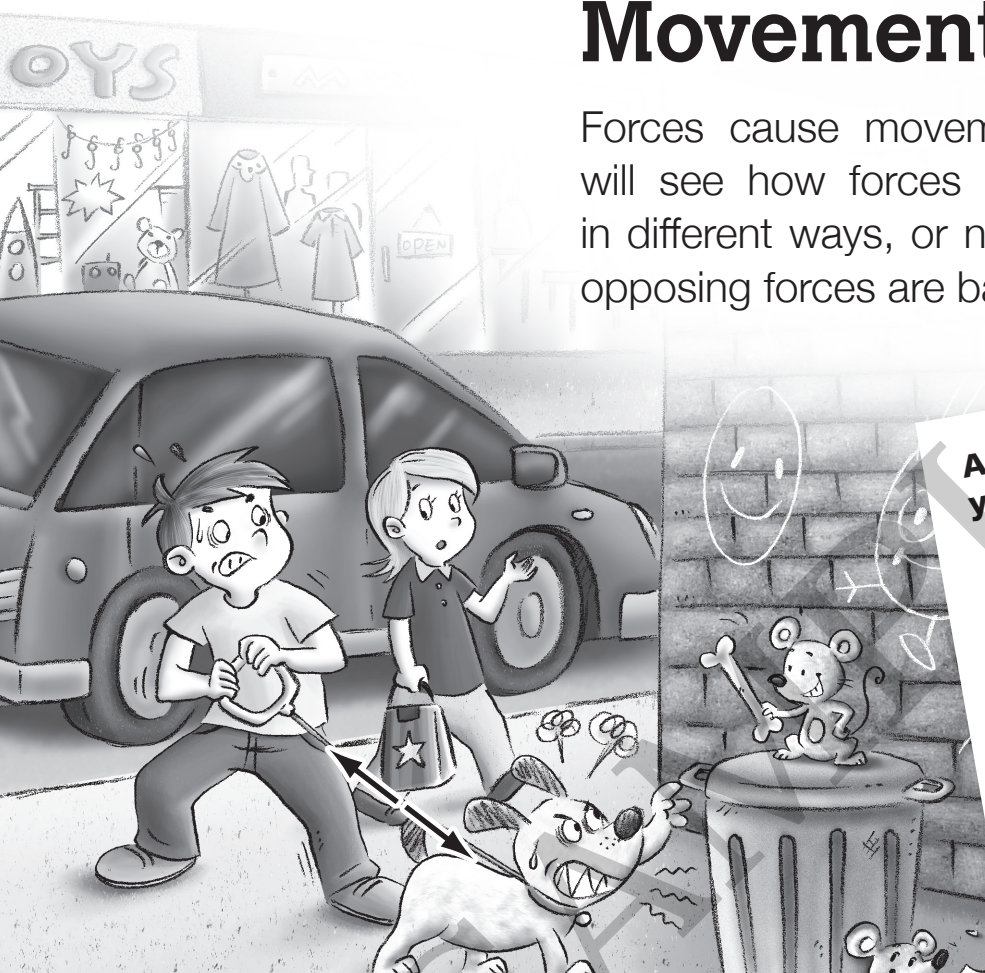
Understanding Earth and Space Systems

Students will learn about soil and identify the different types of soil. They will understand that soil is an essential source of life and it provides nutrients for many living things. Students will also learn that soil not only provides food and water for plants, but it can also be used by humans to make things. When exploring the importance of soil, students will also study the process of composting and learn how to prevent soil erosion.

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3 Forces and Movement

Forces cause movement. In this unit, you will see how forces cause objects to move in different ways, or not move at all if the two opposing forces are balanced.



After completing this unit, you will

- understand how different forces can cause a moving object to keep the same speed, speed up, slow down, change direction, or stop.
- know that movement is caused by unbalanced forces.

The man and his dog have been here for a while and haven't moved at all. They show balanced forces.

Vocabulary

balanced forces: equal amounts of forces on both sides

unbalanced forces: unequal amounts of forces on both sides



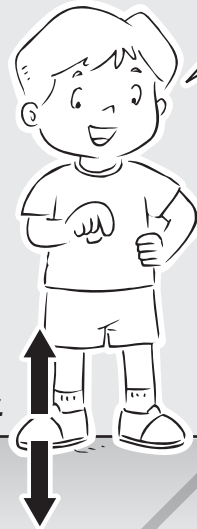
Extension

A force starts, speeds up, slows down, stops, or changes the direction of movement.

Forces happen in pairs. Do you know that there are two forces acting upon a person standing on the ground?

The floor pushes upwards on the boy.

Gravity pulls downwards on the boy.



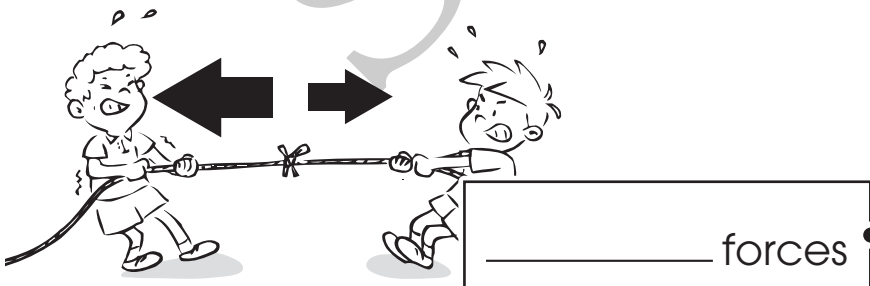
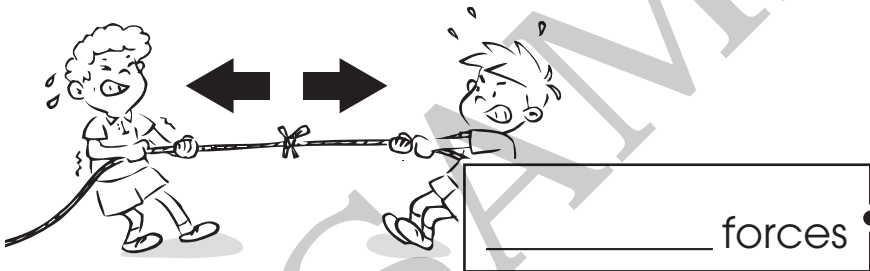
The forces on me are balanced.

What happens if the forces are unbalanced?



A. Look at each pair of arrows. Decide whether the forces are “balanced” or “unbalanced”. Then do the matching.

The bigger the arrows are, the greater the forces.



- moves to the left
- moves to the right
- stays at rest



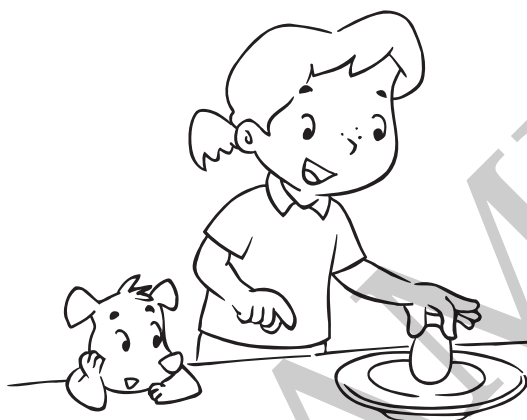
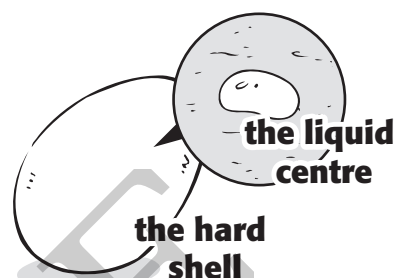
Experiment

Introduction

Isaac Newton's First Law of Motion

An object at rest will stay at rest, and an object in motion will stay in motion – unless another force acts to change that.

Think of an egg as having two parts:



If you spin the egg and then stop it with your fingers, you are stopping only the shell. The liquid inside will stay in motion until something also stops it. At least that is what should happen according to Newton's first law of motion.

? Hypothesis

If a raw egg is spinning, and is then stopped, the liquid centre will continue to spin.

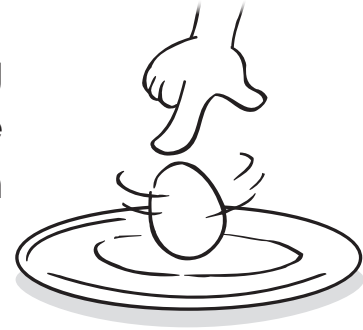
Steps

1. Spin the cooked egg on the big plate.

Materials

- **one raw egg**
- **one hard-boiled egg**
- **a big plate**

2. Stop the egg from spinning by putting a finger on it for a moment. Remove your finger almost as soon as you touch the egg.



3. Repeat steps 1 and 2 with the raw egg.

Result

Record your observations. What did the egg do after you stopped it with your finger?

Cooked egg: _____

Raw egg: _____



The raw egg will continue to spin after it is stopped because the liquid inside keeps moving. It does stop eventually because of other forces acting on it.

Conclusion

The hypothesis was: _____

My experiment _____ the hypothesis. supported/did not support