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Understanding Life Systems

Students will learn about biodiversity and investigate the impacts of environmental conditions and human activities on biodiversity. They will be introduced to the five kingdoms of living things and classify vertebrates into the five groups. The characteristics of some biomes, and their biotic and abiotic elements will also be discussed. Students will also recognize that there is diversity within a species and that living things depend on one another for many reasons.

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Understanding Structures and Mechanisms

Students will study the properties of air and recognize how these properties are applied in their daily lives. They will investigate the four forces of flight – thrust, drag, lift, and gravity – and learn how aircraft create different movements in the air with these forces. Moreover, they will learn about airfoils and the Bernoulli's principle, and use the principle to explain how lift happens. They will compare the flight mechanisms in some living things with human-made flying machines.

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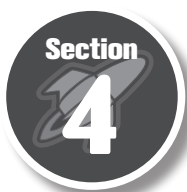
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Understanding Matter and Energy

Students will learn about current electricity and static electricity and the differences between them. They will be introduced to simple circuits and their main components. The differences between open and closed circuits, and series and parallel circuits, will also be examined. Students will study insulators and conductors, as well as the purpose of using each. In addition, they will learn how electrical energy can be transformed from or into other forms of energy. They will realize the impacts of electricity and know how to reduce the use of electricity.

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Understanding Earth and Space Systems

Students will identify the bodies in the solar system and know that some bodies emit light while others reflect light. They will recognize that different bodies are made up of different substances and have different orbital paths. They will also learn the effects of the relative positions of the Earth, the moon, and the sun. In addition, students will appreciate how technology helps humans meet their basic biological needs in space and how space exploration affects our society.

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1 Current and Static Electricity

After completing this unit, you will

- know the difference between static and current electricity.
- know the effects of static electricity.
- know the difference between electricity from sockets and electricity from batteries.

Electricity is part of our everyday lives. Current electricity is useful for powering technology at home, at school, and even outside. Static electricity is a natural phenomenon that happens without our control. In this unit, you will examine both kinds of electricity.

Teddy, do you like your new hairstyle?

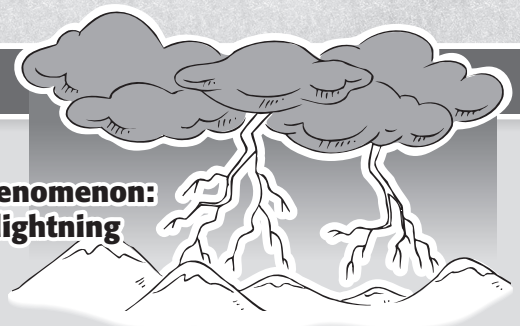
static electricity

vocabulary

phenomenon: a natural event we perceive with our senses

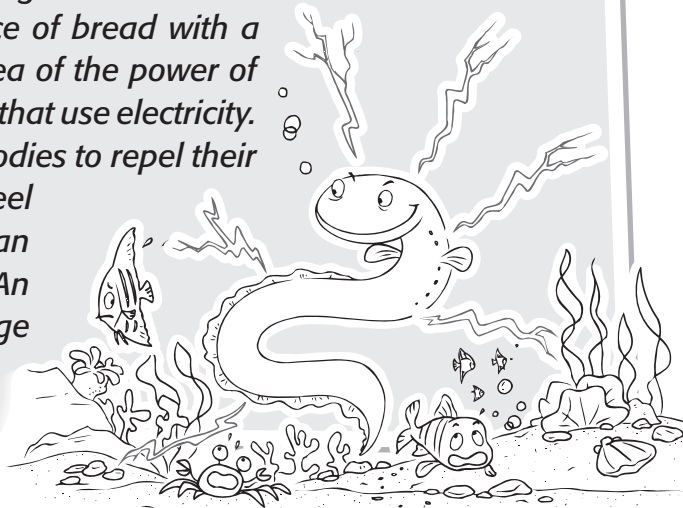
stationary: still

phenomenon: lightning



Extension

Have you ever seen lightning bolts darting down from the sky? Have you ever tried to toast a slice of bread with a toaster? If you have, you have some idea of the power of electricity. Humans are not the only ones that use electricity. Electric eels produce electricity in their bodies to repel their predators or kill their prey. The electric eel is one of the few animals on Earth that can make, store, and discharge electricity. An electric eel can produce an electric charge strong enough to injure a human!



A. Fill in the blanks to complete the descriptions. Then match the descriptions with the correct examples.

flow static contact current

Types of Electricity

- _____ electricity:

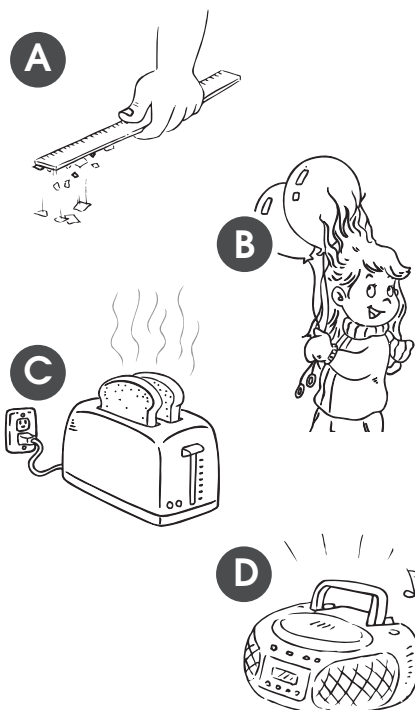
e.g. _____ , _____

a stationary electric charge that builds up on a material due to its _____ with another material

- _____ electricity:

e.g. _____ , _____

a _____ of electric charge, which can be transformed into heat, light, and motion energy

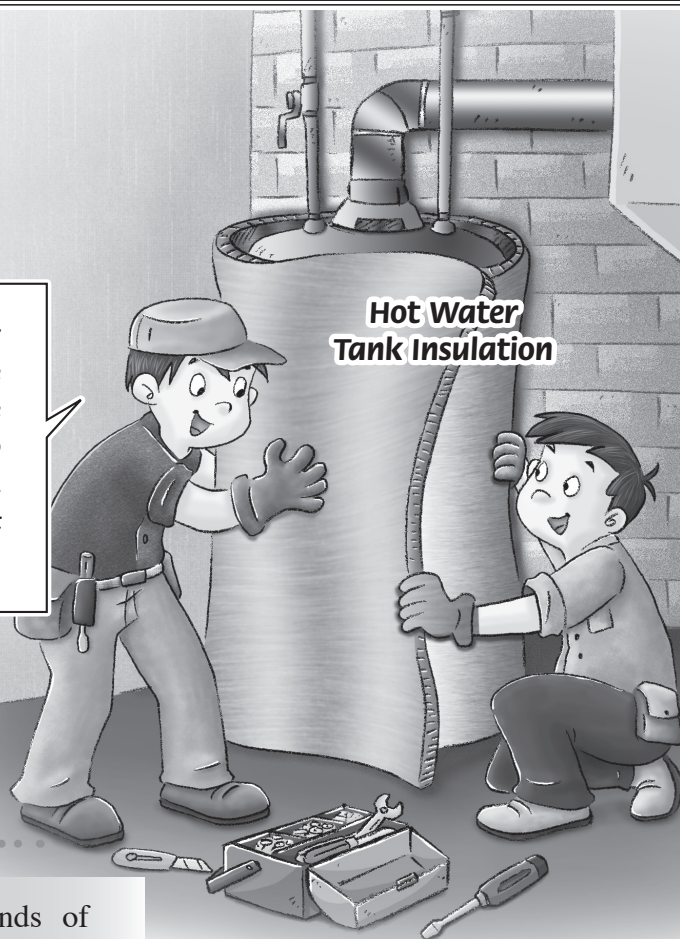




Experiment

Introduction

Since our use of electricity has consequences for the environment, we try to conserve energy and use as little electricity as possible. One way to do that is insulation. We put insulation in our walls, attics, and even around hot water tanks and pipes.



Hypothesis



This experiment tests three kinds of materials for insulation. Predict which will work best. Make your prediction the hypothesis.

Circle one.

Styrofoam / Cloth / Tissue is a great insulating material.

Materials

- 4 small, empty, and clean milk cartons
- 4 ice cubes
- 1 piece of styrofoam, cloth, and tissue

Steps

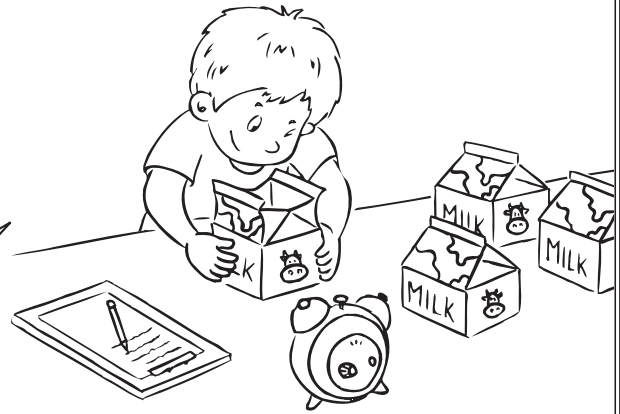
1. Place one ice cube in each carton.
2. Place one kind of material around each ice cube. The one with no material will be your control.



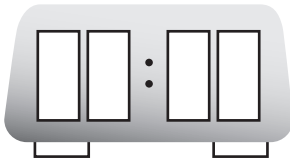
to show you how the ice cube melts without any insulation

- Record the time you begin the experiment on the chart below.
- Keep an eye on the ice cubes. Record the time when each one is fully melted.

You should have the ice cubes fully covered, so you'll have to peek beneath the material to check them.



Start at



Time Melted

Styrofoam	Cloth	Tissue	Control
_____	_____	_____	_____

Result

- How long did it take each ice cube to melt?

Styrofoam: _____ Cloth: _____

Tissue: _____ Control: _____

- Which material insulated its ice cube best?

Conclusion

The hypothesis was: _____

My experiment _____ the hypothesis.
 supported/did not support