

Changing the Form of Energy

Teacher Guide

Overview

Students will learn how energy changes form. They will explore several examples of energy changing from one form to another.

Student Learning Objectives

- Explain that energy cannot be created or destroyed; it can only change form.
- Give examples of energy changing form.

Student Worksheet

The student worksheet includes questions to focus the student and to check understanding, instructions for how to use the Exploration independently, and a section for recording data. Students will review questions before participating in the activity and may respond to the questions either during or after completion of the activity. The section for recording data includes a table in which to record their findings.

Exploration Procedure

Explain that the purpose of this Exploration is to learn how energy changes form. Follow either of the procedures below.

Student Performs Exploration

1. Tell students how much time they will have to complete the Exploration and the student worksheet.
2. Explain how students should proceed:
 - Read the questions before starting the Exploration.
 - Follow the instructions on the worksheet to perform the Exploration.
 - Record their findings.
 - Respond to the questions in writing.
3. Explain that you will be available to help any students who need assistance.
4. Address any questions that the students might have.
5. Tell students to begin the Exploration.
6. When time is up, ask students to share their results.
7. Talk about the Discussion Question.

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Teacher Performs Exploration

1. Display the questions from the student worksheet and ask students to tell you what they think they will learn from the Exploration based on its questions. Highlight key words.
2. Read the Introduction and click the **Continue** button.
3. Read the text and follow the instructions. Watch the animations, read the outcome explanations as they appear, and discuss. Record the information in the data table.
4. Click the **Reset** button to restart the screen. Click the **Previous** button to go back to the previous instruction. Click the **Next** button to move ahead in the Exploration.
5. Click the **Close** button to close the exploration.
6. Discuss each of the questions with the class. Replay parts of the Exploration as necessary to illustrate the answers.
7. Talk about the Discussion Question.

Optional: Use this Exploration as a small-group activity at a computer station. Assign it to students who need specific reinforcement of the concept.

Questions

1. How does energy change form when a person rides a bike? (*Comprehension-Level Objective*)
Answer: When people ride bikes, they use stored chemical energy from their bodies. This energy is changed to mechanical energy.
2. Compare and contrast a battery with a yo-yo. (*Analysis-Level Objective*)
Answer: Both the battery and the yo-yo are capable of storing energy. The battery stores energy in the form of chemical energy until it is released when the cell is placed in a closed circuit. The yo-yo has stored, or potential, energy because of gravity. As the yo-yo falls, this stored energy is released and changed into the energy of motion.
3. How does energy change form when a rocket takes off? (*Comprehension-Level Objective*)
Answer: When a rocket takes off, the chemical energy that had been stored as rocket fuel changes into mechanical energy, heat energy, and sound energy.

Discussion Question

In addition to drinking lots of fluids, why do athletes sometimes eat extra food before, during, or after a competition?

Possible answer: Athletes want to create a lot of mechanical energy, or energy of motion, in order to win. This uses extra chemical energy from their bodies. Athletes replace this chemical energy by eating.