

Hands-On Activity

Energy in the Classroom

Materials:

- Student Investigation Sheet
- In this activity, students explore the classroom to locate examples of objects that use or contain different forms of energy. These include any number of common classroom or laboratory objects:
 - Mechanical energy: anything that moves, such as pencil sharpeners, clocks with moving hands, or fans
 - Chemical energy: food; batteries or battery-operated objects such as clocks, cell phones, or portable music players
 - Thermal energy: anything that gives off heat, such as a Bunsen burner, radiator, or matches
 - Radiant energy: anything that gives off light, such as ceiling lights, flashlights, or computer screens
 - Electrical energy: anything powered by electricity, such as computers, overhead projectors, or televisions
 - Sound energy: anything that produces sound, such as musical instruments, radios, or alarm bells

Remind students that energy is found everywhere, including in the classroom. Give students 5 or 10 minutes to explore the classroom, trying to locate different objects that use or contain energy. As they explore, students should organize their notes in the following three-column chart; if they do not think an object both uses and contains energy, they should leave the appropriate cell blank. Encourage the students to use descriptive words such as loud, hot, and bright to record their data. Remind students that objects may use or contain several different kinds of energy. Remind students that their bodies use and contain energy also.

Object	How Does It Use Energy?	How Does It Contain Energy?

As students explore, circulate to make sure they are behaving appropriately and not handling any dangerous objects. Regroup as a class and have volunteers share their notes. Explain that scientists look at their data and organize it. Scientists often use tools such a computer to help them organize what they have found. Use a computer to construct a table with six columns. Record students' notes on the table based on the form of energy that is being described: Mechanical, Chemical, Thermal (heat),

Radiant (light), Electrical, Sound. Some examples may be placed in several columns; for example, a battery-operated clock with moving hands might be placed in the mechanical column, the chemical column, and the sound column (if it ticks). Do not identify the headers of these columns or explain your method for sorting. However, you should write each example on the board in such a way that students will be able to infer your method of sorting. For the battery-operated clock, you might write “The clock’s hands move” in the “Mechanical” column; you might write “The clock is powered by a battery” in the “Chemical” column; you might write “The clock makes a ticking sound” in the “Sound” column.

Try to fill each column with 3–5 examples; if students struggle to fill a column, prompt them with clues. Then explain that energy comes in different forms, and that each column on the board represents one form of energy. Model for students how to insert a row for a heading on the table. Then, have them work in groups to add a header. They should try to identify the form of energy that each column represents, and then discuss their responses. At this point, don’t expect students to think of the scientific terms for each form of energy, just encourage the students to use descriptive words to explain the data to identify the “Mechanical Energy” column; for example, students will probably use a description such as “All these objects move.” If students cannot identify a column, leave it blank so that they can search for the answer in the Explore. Use the student responses to assess their use of descriptive words to record data.

In this activity, students will demonstrate the following Inquiry Skills:

- Design Investigations
 - Practice lab safety by:
 - Following lab safety procedures
 - Recognizing safety equipment and materials and knowing their proper use
- Gather Data
 - Use senses to observe:
 - Seeing (color, shape, size, texture, motion)
 - Hearing (pitch, volume, reflection, direction)
 - Touching (temperature, texture, shape, size, vibration, motion)
 - Kinesthetic (balance, position)
 - Uses the appropriate format to record data:
 - Table
- Interpret Data
 - Sorts and classifies using scientific reasoning:
 - Objects, substances and organisms by characteristic
 - Apply a classification scheme to objects, substances or organisms

Analysis and Conclusions

1. Were you surprised at the number of objects you found that contained or used energy? Why?

SAMPLE ANSWER: I was surprised about how many things use and contain energy. I didn't think of all of the things we use every day. I never thought about our pencil sharpener using energy!

2. What were some forms of energy you observed?

SAMPLE ANSWER: The lamp on the teacher's desk has a bulb that gives off radiant and thermal energy. The lamp also uses electrical energy.

3. How did constructing a table help you to understand forms of energy?

SAMPLE ANSWER: It helped me to see all the forms of energy written down. The categories helped me to understand all the different ways energy can be made or used.