

# Workshop 1

## What Is Energy?

Interviews with children, scientists, and people on the street reveal that many of us share common-sense ideas about the subject of energy, leading to statements such as, “sunny days give me energy” or “energy is a source of life.” This program explores some of the differences and similarities between the everyday and the scientific language of energy, recognizing that many everyday concepts are useful launching points for getting to know more about energy. The program traces the development of these ideas through interviews with scientists and with children, aged 10 and 11.

After a brief tour of the history of the scientific concept of energy, this session defines different forms of energy and discusses how central the idea of energy is to a scientific understanding of the world. Finally it shows how the “Big Idea” of energy is embedded in the K-6 curriculum with views of elementary classrooms in which students and teachers are engaged in activities related to energy, even when the word *energy* is never explicitly mentioned.

# On-Site Activities

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## Getting Ready (30 minutes)

### What Is Energy?

1. During the next few weeks, you will be studying the concept of energy. Before we begin, how would you define energy?

Write out your definition of the word *energy* on a sheet of paper and hand it to your workshop facilitator. It will be returned to you at the end of Workshop 8.

2. Write down your responses to the following questions. Then share them with a partner and make a combined list to share with others in the group.

- a. If you asked your students to define the word *energy*, what do you think they would say?
- b. If you asked one of your teaching colleagues to define the word *energy*, what would he or she say?

3. Discuss the key ideas in these shared responses. What are some similarities and differences between the students' definitions and the teachers' definitions?

## Watch the Video (60 minutes)

As you watch the video, consider the following questions and answers:

1. What is energy?

***Energy is the ability to do work.***

2. What are some forms of energy?

***Forms of energy include light, sound, heat, mechanical, and chemical.***

3. Where does energy come from?

***The Sun is the source of almost all energy on Earth that we use.***

4. How did scientists develop the concept of energy?

***Scientists arrived at the idea of energy by investigating heat.***

## Going Further (30 minutes)

### Making Meaning

In this program, several different metaphors for energy were introduced. Discuss with a group which of the metaphors was easiest for you to understand? Why?

### Lights, Camera, Energy!

With a partner, discuss the following: You have been hired to design a video series based on the concept of energy. As you are outlining the plans for your work, be sure to consider the following list of questions.

1. What topics will you cover in the series?
2. What activities or demonstrations will you do to illustrate the concept of energy?
3. What real-life examples will you provide to help the audience better understand energy?

Share your ideas with the group and then look for them as you watch this video series.

# For Next Time

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## Homework Assignment

Later in the workshop, you are going to need some information that you will begin collecting now. Each time you go to the gas station for the next few weeks, please record the following data in the table below. You will discuss it during the Getting Ready for Workshop 7.

If you have two cars in your family, please collect separate data for each car. Record the make, model, year, and engine size (4-, 6-, or 8-cylinder) below.

### CAR 1:

Make \_\_\_\_\_

Year \_\_\_\_\_

Model \_\_\_\_\_

Engine size \_\_\_\_\_

Miles driven since last fill-up	Total gallons on this fill-up	Miles/gallon	Miles driven since last fill-up	Total gallons on this fill-up	Miles/gallon

### CAR 2:

Make \_\_\_\_\_

Year \_\_\_\_\_

Model \_\_\_\_\_

Engine size \_\_\_\_\_

Miles driven since last fill-up	Total gallons on this fill-up	Miles/gallon	Miles driven since last fill-up	Total gallons on this fill-up	Miles/gallon

## Reading

Read the article by Mary Kay Hemenway titled "Our Star the Sun," found in the Appendix of this guide. Identify three facts about the Sun that relate to energy.

## Materials Needed for Next Time

The Going Further section for Workshop 2 requires a ruler and a stopwatch.

# Notes

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