



# Energy

by Vijaya Khisty Bodach

## *A Little Background*

Many things in people's daily lives (including people themselves!) require energy. Energy is the ability to do work, and without it, humans, nature, animals, and machines would not be able to accomplish what they need and want to do.

Energy comes in many forms: electricity, biomass (energy from plants), geothermal (energy from the Earth's core), fossil fuels (coal, oil, natural gas), hydropower (energy from water), nuclear, solar (energy from the Sun), and wind energy. A main difference between the many different forms of energy is that some are renewable energy sources while others are irreplaceable, or nonrenewable. Once fossil fuels are used, they are gone forever; however, solar, water, wind, and geothermal power are renewable because nature will replace and replenish these resources. While the Earth has enough fossil fuels right now for everyone's energy needs, fossil fuels will not last forever. Because of this, scientists and governments are busy trying to use alternate energy sources as much as possible.

Energy can also be classified in two ways: potential energy, which is stored energy that is not being used; and kinetic energy, which is moving energy that is actually doing work. When changing from potential energy to kinetic energy, the form of the energy can also

change. For example, a house that has solar panels would store up potential energy from the sun until it was needed for electricity, at which time it would become kinetic energy.

The United States is the world's largest producer and consumer of energy. We are also the largest importer of oil, natural gas, coal, and electricity. Without energy, our society would not have lightbulbs, computers, refrigerators, microwaves, indoor plumbing (toilets, baths, and showers!), televisions, radios, cars, boats, airplanes, heat, air conditioning, etc. The list seems never-ending! Without electricity, our lives would be cold, dark, and quiet.

**Guided Reading Level:** I/J

**Lexile:** 410

**Word Count:** 318

**Vocabulary**

• **Content Words:**

batteries, electricity, energy, hydropower, light energy, motion energy, muscle, power plants, solar energy, stored energy

## Preview the Book

Write the word *energy* on the board and discuss its meaning.

*Has someone ever told you that you have lots of energy? What did they mean?*

Explain that scientists define *energy* as “the ability to do work.” Work doesn’t just mean chores or jobs, it means getting anything done. People, animals, nature, and machines all use and need energy to survive and work properly.

### *Jump Start* (ELL & Struggling Readers)

The content vocabulary and concepts will most likely be new to all students and are more effectively taught as they are presented in context when children read the book and during after-reading discussions. Due to the heavy concept load in this title, it is suggested that the book be read and discussed chapter by chapter. Classroom discussion, while helpful to all students, is so beneficial for those students at a disadvantage due to their limited English proficiency or below-grade-level literacy skills.

## Let's Read

### Before Reading

- Introduce the book by asking a volunteer to read aloud the title and the author.

*What animal is on the front of the book? (a tiger)*

*Why is there a tiger on the front of a book about energy? (Tigers need energy to run.)*

- Ask children to turn to the Table of Contents on page 2. Explain that previewing the Table of Contents can provide an overview of what readers can expect to learn in a book. Ask for a volunteer to read the title of Chapter 1. Use the Concept Web graphic provided on p. 106 to create an overhead transparency. Write the word *Energy* in the center circle. Then demonstrate how to turn the chapter title into a category on the energy web by writing “What it is” in one of the circles. Continue in the same manner with the other 4 chapter titles. Once the web is completed, read it aloud to show all that children can expect to learn when they read *Energy*.

- Ask a volunteer to read the question on the back cover. Explain to children that this question will be answered as they read *Energy*. It might be best to have children read and discuss this title chapter by chapter. The comprehension questions offered in the next section are presented by chapters.

## After Reading Comprehension

- Use the following questions to discuss what children have read.

### Chapter 1: What Is Energy?

1. What does work mean? (*getting anything done*)
2. Is it work to ride a bike? (*yes*) Does it take energy to ride a bike? (*yes*) Do you need more energy to ride a bike up or down a hill? (*up a hill*)

### Chapter 2: Where Does Energy Come From?

3. What do you do to get energy? (*eat food*)
4. What do animals do to get energy? (*eat food*) What food do they eat? (*other animals and plants*)
5. Where do plants get their energy? (*from the Sun*)

### Chapter 3: How Is Energy Stored?

6. How do animals store energy in their bodies? (*as muscles and fat*)
7. When a tiger runs, what happens to the stored energy in his muscles? (*It turns into motion energy.*)
8. What do power plants and batteries do? (*They store energy.*)

### Chapter 4: All Kinds of Energy

9. What is energy from the Sun called? (*solar energy*)
10. What is energy from moving water called? (*hydropower*)
11. Wind power is another source of energy. What is wind power used to create? (*electricity*)
12. Electricity and heat are two other forms of energy. What do we use them for? (*Electricity gives us light. We use heat to cook our food and keep us warm.*)

### Chapter 5: Energy Changes Form

13. Look at pages 14–15. Without eating the chicken, is there another way you could get the energy from the Sun to ride your bike? (*eat the corn*)

- Arrange the children in pairs to reread the book. Pair less-able readers with better readers.

## Word Study

- Have children read the first sentence on page 11. Ask if anyone knows why the words *Sun* and *Earth* are capitalized in the sentence. Explain that *Sun* and *Earth* are **proper nouns** (Earth because it is referring to the specific planet and Sun because it is the specific sun that is the center of our solar system). Proper nouns are capitalized because they refer to a specific person, place, or thing. Street names, a person's name, school names, city names, and days and months are always capitalized because they are proper nouns.

Write the following common nouns on the board. Ask a volunteer to suggest a proper noun to match each common noun. Complete the first pair for the children.

girl/ \_\_\_\_\_  
 boy/ \_\_\_\_\_  
 day/ \_\_\_\_\_  
 month/ \_\_\_\_\_  
 town/ \_\_\_\_\_  
 state/ \_\_\_\_\_

## Think Like a Scientist

- Refer to the Energy Concept Web created before reading. Provide children with a blank copy of the reproducible Concept Web graphic on page 106. Encourage them to choose one of the outside circles from the prereading web as the subject (center circle) of their new web and to fill in the outside circles with related information. Encourage children to refer to *Energy* to help them complete their webs.
- Focus on electrical energy. As a group, tour the classroom and list everything that uses electricity. Record the list on the board or on chart paper. Then ask children to turn their focus to their homes and continue listing everything they can think of that uses electricity. It will soon become clear to children how much we rely on electricity.
- Remind children that we have renewable and nonrenewable sources of energy. Gas that we use to power our cars is a nonrenewable source of energy. Brainstorm ways our society can use less of this nonrenewable resource. (take advantage of alternate sources of fuel, such as those made with ethanol and gas; drive smaller cars or hybrid cars that use less gas; limit the number of trips we take; walk or ride a bike instead of driving everywhere; use public transportation, such as buses, subways, trains, etc.)