

RENEWABLE ENERGY

Renewable Energy Resources (ri nü' ə bəl en' ə r jē rē' sōrs əs)

energy resources that can be replaced in 30 years or less

Inexhaustible Resources (in' eg zōs'tə bəl rē' sōrs əs)

energy resources that can never be used up

Using SCIENCE Words

1. Wind energy is a(n) _____.
 - A. renewable energy resource
 - B. nonrenewable energy resource
 - C. inexhaustible energy resource

- 1 Fossil fuels such as coal, oil, and natural gas are major sources of energy. But supplies of fossil fuels are limited. As fossil fuels are used up, people are turning to alternative sources of energy.
- 2 Wind energy, energy from the sun, and heat energy from inside Earth are some alternative forms of energy. These supplies can't be exhausted, or used up. Energy sources that can't be used up are called **inexhaustible resources**.
- 3 People have used wind energy for hundreds of years to grind grain in windmills and to pump water. Today, wind energy is used to produce electricity. The wind must blow most of the time at 12 km per hour or more to produce electric current.
- 4 The wind spins many large turbines. The moving energy of the turbines produces electricity. In the United States, most of the land suitable for using wind energy is in the western states.
- 5 Solar energy is used to heat water and homes. The most common solar collectors are rooftop water heaters and windows that face the sun. Solar energy can also be converted and stored as electricity. Solar cells convert energy from the sun directly into electricity.
- 6 At some solar energy stations, thousands of mirrors focus solar energy on a central receiver. This solar energy is converted to thermal energy and is used to boil water. The water changes to steam, which turns turbines to generate electricity.
- 7 A third inexhaustible resource is the thermal energy inside Earth. This energy is called geothermal energy. Some of the water under Earth's surface is heated as it flows over very hot rocks. When steam pressure builds up, some of the steam and hot water escapes through Earth's crust in hot springs and geysers. The steam produced by geysers and hot springs is used in some parts of the world to produce electricity.
- 8 The use of wind energy, solar energy, and geothermal energy to produce electricity isn't practical in many areas. Electricity generated from geothermal energy is used in a few western states and also in New Zealand and Iceland. Once facilities for converting geothermal energy, wind, and solar energy are built, they're not expensive to operate.
- 9 The energy of moving water and the energy of once-living materials are two other sources of electricity. These sources are called **renewable energy resources** because they're replaced naturally in fewer than 30 years. Water is constantly used and replenished in the water cycle.
- 10 When moving water is used to produce electricity, huge amounts of water are collected in human-made lakes and held back by dams. When the dams are opened, the water falls. This moving energy spins turbines to generate electricity.
- 11 Some materials that were once living or that come from living things can be burned to produce electricity. For example, paper, cardboard, and yard wastes all come from plants. These materials, as well as solid waste from animals, can be burned at power stations. The thermal energy they produce is converted into electricity.

COMPREHENSION

Write the letter of the best answer.

2. Thermal energy inside Earth is _____.
 - a. a fossil fuel
 - b. a renewable energy resource
 - c. an inexhaustible energy resource
3. Most wind energy used in the United States is produced in _____.
 - a. the western states
 - b. areas with geysers and hot springs
 - c. the winter
4. Resources that can be replaced within 30 years are _____.
 - a. renewable
 - b. nonrenewable
 - c. inexhaustible
5. Water used to produce electricity is controlled by _____.
 - a. turbines
 - b. dams
 - c. generators
6. Waste materials from plants and animals are used in power plants _____.
 - a. to produce solar energy
 - b. to replace electricity
 - c. to produce electricity

LEARN ABOUT WORDS

A. You can often tell the meaning of a word by reading the words around it. Look at each number in parentheses. Find the paragraph in the reading with the same number. Then find the term that fits the given meaning. Write the term.

7. other (1)
8. energy source that can't be used up (2)
9. natural fountains of hot water (7)
10. thermal energy from inside Earth (8)
11. resources that can be replaced within 30 years (9)

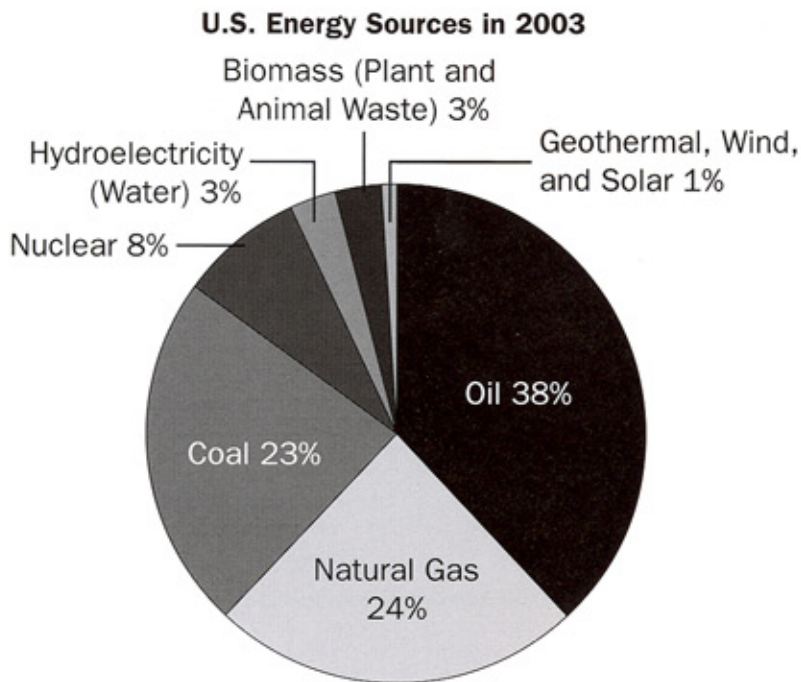
B. The **doctor** smiled at **Joe**. (persons)
Jungles in **Peru** are hot. (places)
The **car** needs **oil**. (things)

The words in **bold type** are nouns. A noun indicates a person, place, or thing. Each phrase below contains one noun. Write the noun.

12. using water to generate
13. Some energy is renewable
14. in wet regions
15. to build solar-powered cars
16. higher than its temperature

THINK ABOUT IT

Look at the circle graph. Then answer the question.



17. Which statement best summarizes the circle graph?
- A. The United States depends on a variety of renewable energy sources.
 - B. The United States is dependent on fossil fuels as energy sources.
 - C. The United States needs to use more nuclear energy.
 - D. Coal is the major energy source of the United States.

Using SCIENCE Words

1. C

Comprehension

2. c
3. a
4. a
5. b
6. c

Learn About Words

- A.
7. alternative
 8. inexhaustible resource
 9. geysers
 10. geothermal energy
 11. renewable energy resources
- B.
12. water
 13. energy
 14. regions
 15. cars
 16. temperature

Think About It

17. B

Writing About Science

Describe an area where geothermal energy could be used.