

2 Energy Sources

We now know that we use energy in different forms all the time but where does each energy form come from? For example, we know that a toaster uses electrical energy to produce heat energy, but where did it get its electrical energy? In this unit, you will look at various energy sources.

After completing this unit, you will

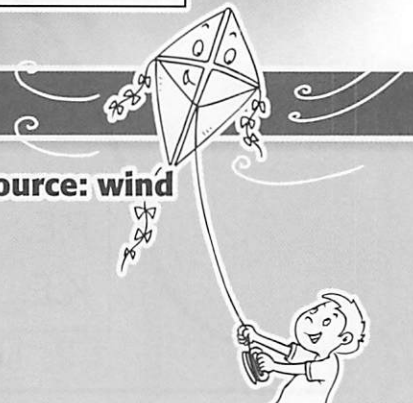
- be able to identify different energy sources.
- know where each source of energy comes from.
- know the characteristics of each kind of fossil fuel.



Vocabulary

energy source:
a material that produces energy

energy source: wind



Extension

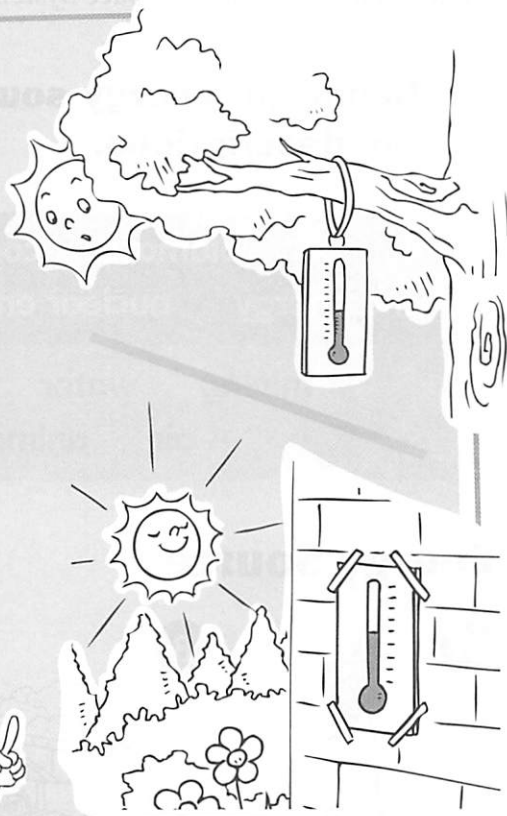
We know that plants get energy from the sun to grow and make their own food, but do you know how much energy the sun gives us? The sun gives off light, which allows us to see, and gives off heat to warm up the Earth. Can you feel the heat energy from the sun? On a hot, sunny day, hang a thermometer under the shade of a tree and hang another thermometer under the sun. After 1 hour, check and record the temperatures on the thermometers.



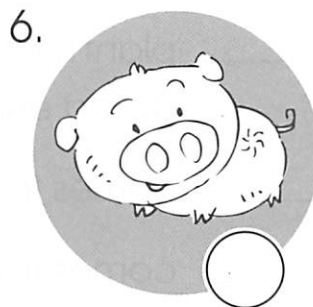
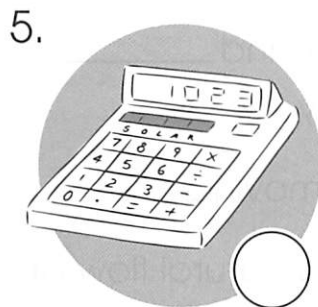
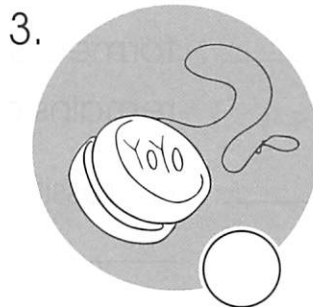
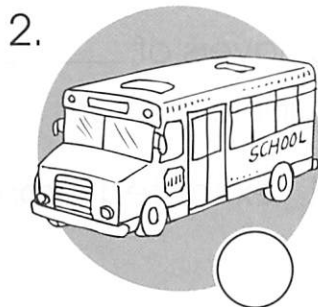
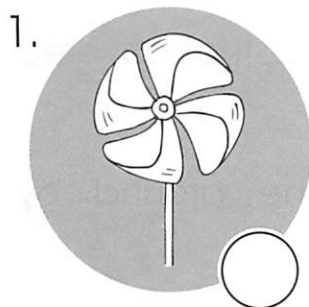
under the shade of a tree: _____

under the sun: _____

Why aren't the temperatures shown on the two thermometers the same?



A. What make things work or grow? Write the letters in the circles.



A wind

B food

C the sun

D gasoline

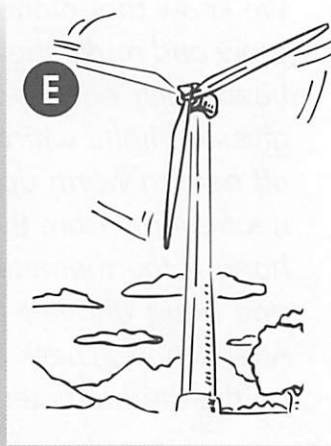
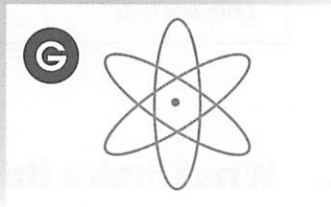
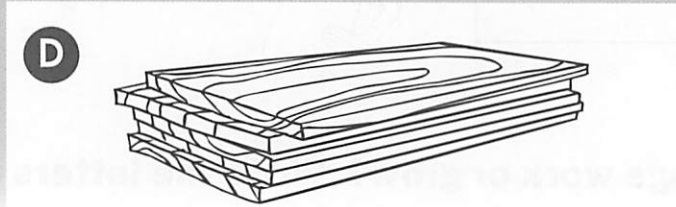
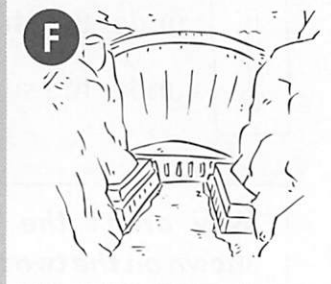
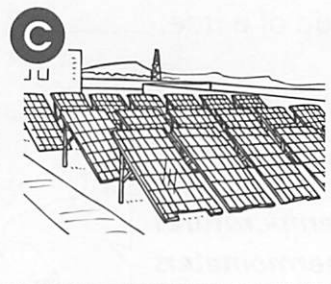
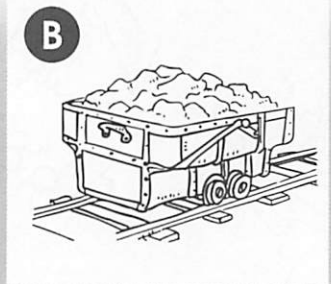
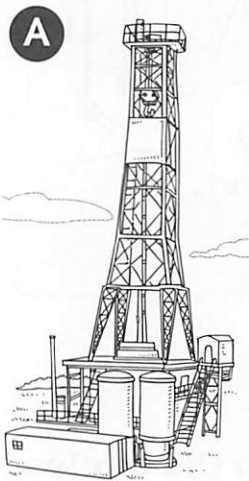
E battery

F muscles

B. Name the energy source and complete the descriptions.

oil	biomass	coal	solar energy
wind energy	nuclear energy	hydroelectricity	
mining	water	nuclear	rays
air	animal	mud	

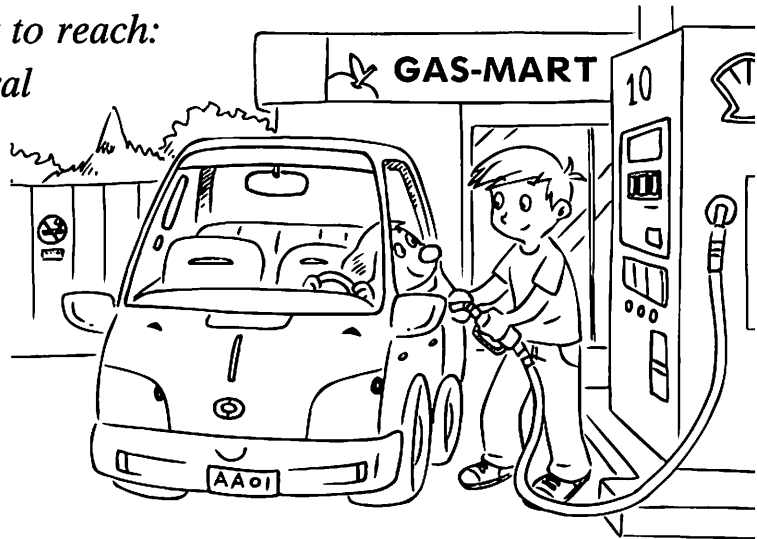
Energy Source



- A** _____ : formed under layers of _____ that covered remains of organic matter
- B** _____ : a fossil fuel extracted from the ground by _____
- C** _____ : comes from the sun's _____
- D** _____ : plant material and _____ waste that contain stored energy
- E** _____ : comes from moving _____
- F** _____ : comes from a natural flow of _____
- G** _____ : energy released by a _____ reaction

C. Read the paragraph. Then answer the questions.

Combined, fossil fuels are the main source of the world's energy. All fossil fuels were formed in a similar way: the bodies of dead plants and animals were covered with layers of sediment millions of years ago. Millions of years of exposure to intense heat and pressure from inside the Earth fossilized their remains, changing them chemically. They became black goo (oil), gas (natural gas), or black, rock-like solids (coal). Since fossil fuels form beneath the Earth's surface, they can be difficult to reach: coal must be mined, and oil and natural gas must be drilled for. The different fossil fuels come from different types of plants and animals that were exposed to different amounts of heat and pressure during fossilization.



1. How are fossil fuels formed?

2. Read the descriptions. Name the fossil fuels and fill in the blanks.

Types of Fossil Fuels

a.

- _____ goo
- can be obtained from drilling
- is commonly used for fuel

b.

- _____ solids
- can be obtained from _____
- is mainly used to generate _____
electricity/ideas

c.

- gas
- can be obtained from _____
- is mainly used to _____ systems
vacuum/heat

3 Renewable and Non-renewable Sources of Energy

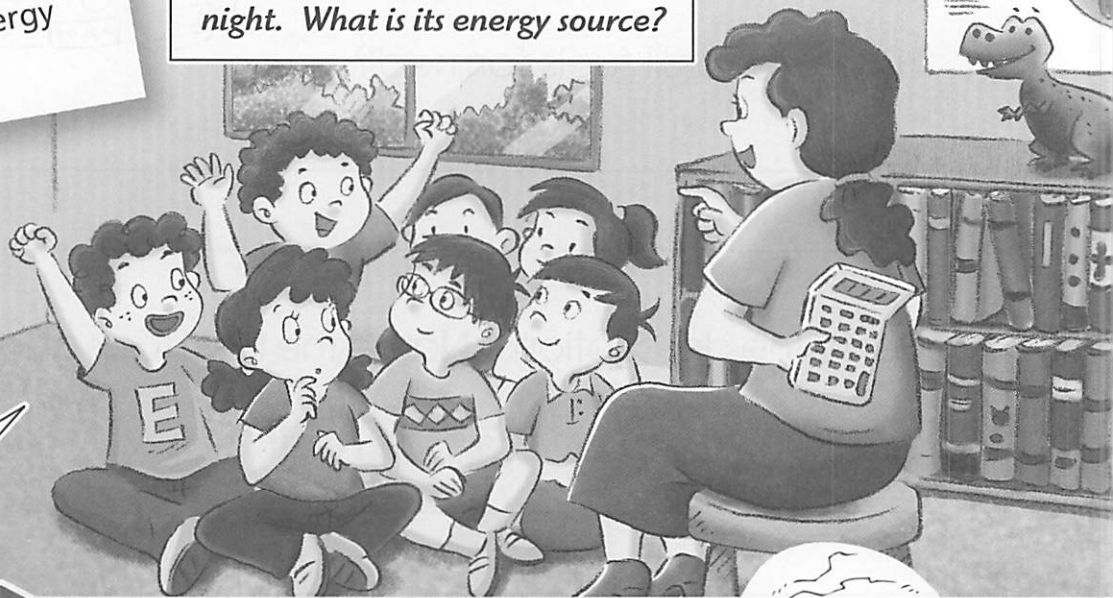
After completing this unit, you will

- know what renewable and non-renewable energy sources are.
- know the characteristics of some energy sources.

All energy sources are either renewable or non-renewable. In this unit, you will learn about these two kinds of energy sources and identify some energy sources as renewable or non-renewable.

I have a calculator that stores energy during the day so that it can work at any time, even at night. What is its energy source?

It is solar!

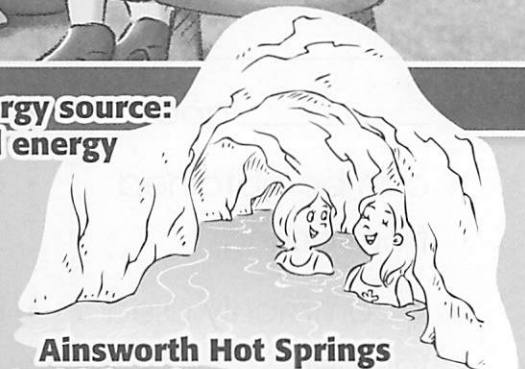


Vocabulary

renewable energy source:
geothermal energy

renewable energy source:
an energy source that will never run out

non-renewable energy source:
an energy source that is not replaced or is replaced only very slowly by natural processes



**Ainsworth Hot Springs
(British Columbia, Canada)**

Extension

Hydroelectric energy is produced by the force of moving water. Moving water is not the only way that we use water to make things work. People 200 years ago already knew how to use steam to make a locomotive move. Coal was the fuel used for heating the water in a locomotive. When heated, the liquid water turns to steam, which is gathered to push the piston that connects to the driving wheels to make the locomotive move. Water is an important energy source. Can you come up with an idea of using water power to do work at home?



A. Fill in the blanks with the given words.

replaced natural run
limited

examples
water oil sun
natural gas

Energy Sources

Renewable Energy Sources:

sources of energy that are generated by 1. _____
resources that will never 2. _____ out

e.g. 3. _____

4. _____

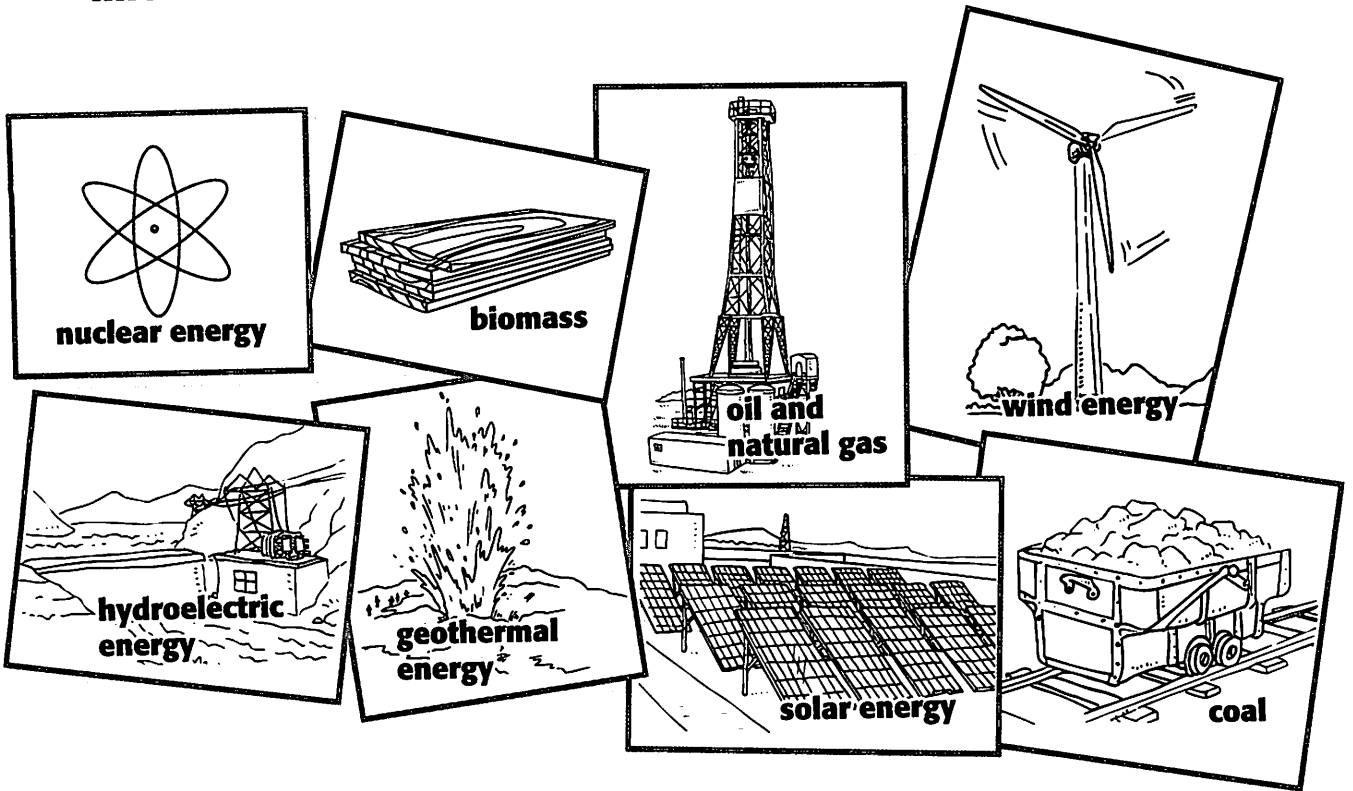
Non-renewable Energy Sources:

natural resources that cannot be 5. _____ quickly and have a 6. _____ supply

e.g. 7. _____

8. _____

B. Sort the energy sources into the correct columns. Then draw lines to match the terms with the correct descriptions.



**Renewable
Energy Sources**

**Non-renewable
Energy Sources**

- reliable sources; provide steady energy supply
- unreliable sources; they rely heavily on geographical activities
- difficult to find the right site to capture natural resources
- will be depleted

C. Read the paragraph. Then complete the diagram.

Biomass is a valuable renewable energy source that comes from non-fossil organic matter, such as wood, grass, and animal waste. In Canada, pulp and paper plants and saw mills are major users of biomass as an energy source. They use their own waste products, such as bark, wood chips, diseased or damaged trees, and sawdust, to generate electricity to meet both their own needs and the needs of the communities around them. Biomass can generate electricity in a number of ways, including burning it to heat water. This generates steam that causes turbines to turn and produce electricity. Mixing biomass with water and sealing it in a tank where it is digested by special bacteria produces a gas called biogas. This gas can then be used to generate electricity as well.

The Energy Source of a Pulp and Paper Plant

