SECTION 4

Natural Resources

TEKS 3D, 6B, 6C, 21B, 21C, 22A, 22D

What You Will Learn...

Main Ideas

1. Earth provides valuable resources for our use.
2. Energy resources provide fuel, heat, and electricity.
3. Mineral resources include metals, rocks, and salt.
4. Resources shape people's lives and countries' wealth.

The Big Idea

Earth's natural resources have many valuable uses, and their availability affects people in many ways.

Key Terms

natural resource, *p. 68*
renewable resources, *p. 69*
nonrenewable resources, *p. 69*
deforestation, *p. 69*
reforestation, *p. 69*
fossil fuels, *p. 69*
hydroelectric power, *p. 70*

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TAKING NOTES

Use the graphic organizer online to take notes on Earth's resources.

If YOU lived there...

You live in Southern California, where the climate is warm and dry. Every week, you water the grass around your house to keep it green. Now the city has declared a "drought emergency" because of a lack of rain. City officials have put limits on watering lawns and on other uses of water.

How can you help conserve scarce water?

BUILDING BACKGROUND In addition to plant and animal life, other resources in the environment greatly influence people. In fact, certain vital resources, such as water, soils, and minerals, may determine whether people choose to live in a place or how wealthy people are.

Earth's Valuable Resources

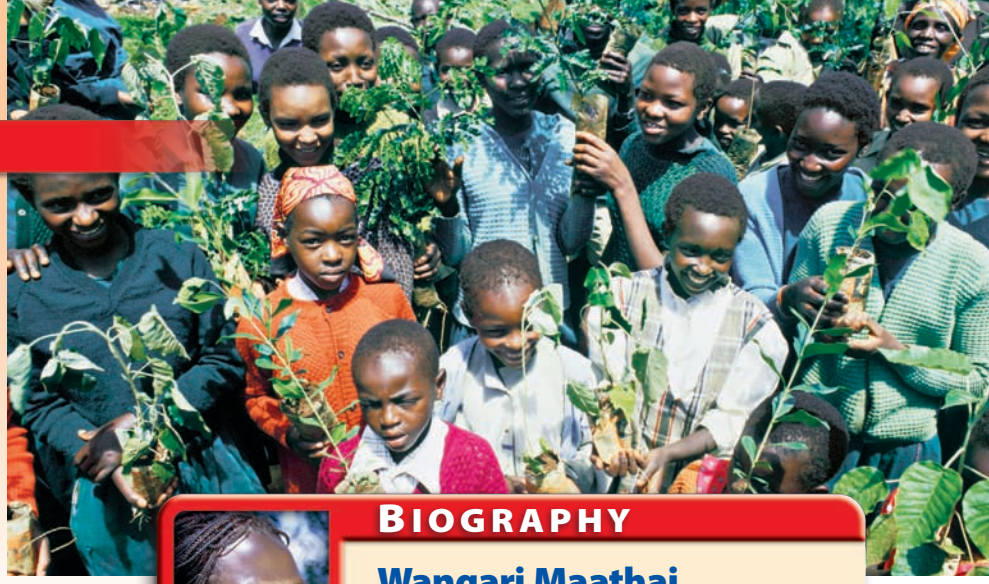
Think about the materials in nature that you use. You have learned about the many ways we use sun, water, and land. They are just a start, though. Look at the human-made products around you. They all required the use of natural materials in some way. We use trees to make paper for books. We use petroleum, or oil, to make plastics for cell phones. We use metals to make machines, which we then use to make many items. Without these materials, our lives would change drastically.

Using Natural Resources

Trees, oil, and metals are all examples of natural resources. A **natural resource** is any material in nature that people use and value. Earth's most important natural resources include air, water, soils, forests, and minerals.

Understanding how and why people use natural resources is an important part of geography. We use some natural resources just as they are, such as wind. Usually, though, we change natural resources to make something new. For example, we change metals to make products such as bicycles and watches. Thus, most natural resources are raw materials for other products.

Reforestation



Members of the Green Belt Movement plant trees in Kenya. Although trees are a renewable resource, some forests are being cut down faster than new trees can replace them. Reforestation helps protect Earth's valuable forestlands.

ANALYZING VISUALS **How does reforestation help the environment?**

BIOGRAPHY

Wangari Maathai
(1940–2011)

Can planting a tree improve people's lives? Wangari Maathai thinks so. Born in Kenya in East Africa, Maathai wanted to help people in her country, many of whom were poor. She asked herself what Kenyans could do to improve their lives. "Planting a tree was the best idea that I had," she says. In 1977 Maathai founded the Green Belt Movement to plant trees and protect forestland. The group has now planted more than 30 million trees across Kenya! These trees provide wood and prevent soil erosion. In 2004 Maathai was awarded the Nobel Peace Prize. She is the first African woman to receive this famous award.

Types of Natural Resources

We group natural resources into two types, those we can replace and those we cannot. **Renewable resources** are resources Earth replaces naturally. For example, when we cut down a tree, another tree can grow in its place. Renewable resources include water, soil, trees, plants, and animals. These resources can last forever if used wisely.

Other natural resources will run out one day. These **nonrenewable resources** are resources that cannot be replaced. For example, coal formed over millions of years. Once we use the coal up, it is gone.

Managing Natural Resources

People need to manage natural resources to protect them for the future. Consider how your life might change if we ran out of forests, for example. Although forests are renewable, we can cut down trees far faster than they can grow. The result is the clearing of trees, or **deforestation**.

By managing resources, however, we can repair and prevent resource loss. For example, some groups are engaged in **reforestation**, planting trees to replace lost forestland.

READING CHECK **Contrasting** How do renewable and nonrenewable resources differ?

Energy Resources

Every day you use plants and animals from the dinosaur age—in the form of energy resources. These resources power vehicles, produce heat, and generate electricity. They are some of our most important and valuable natural resources.

Nonrenewable Energy Resources

Most of the energy we use comes from **fossil fuels**, nonrenewable resources that formed from the remains of ancient plants and animals. The most important fossil fuels are coal, petroleum, and natural gas.

Coal has long been a reliable energy source for heat. However, burning coal causes some problems. It pollutes the air and can harm the land. For these reasons, people have used coal less as other fuel options became available.

Focus on Reading

In the second sentence on this page, what cause does the word *because* signal? What is the effect of this cause?

Today we use coal mainly to create electricity at power plants, not to heat single buildings. Because coal is plentiful, people are looking for cleaner ways to burn it.

Petroleum, or oil, is a dark liquid used to make fuels and other products. When first removed from the ground, petroleum is called crude oil. This oil is shipped or piped to refineries, factories that process the crude oil to make products. Fuels made from oil include gasoline, diesel fuel, and jet fuel. Oil is also used to make petrochemicals, which are processed to make products such as plastics and cosmetics.

As with coal, burning oil-based fuels can pollute the air and land. In addition, oil spills can harm wildlife. Because we are so dependent on oil for energy, however, it is an extremely valuable resource.

The cleanest-burning fossil fuel is natural gas. We use it mainly for heating and cooking. For example, your kitchen stove may use natural gas. Some vehicles run on natural gas as well. These vehicles cause less pollution than those that run on gasoline.

Renewable Energy Resources

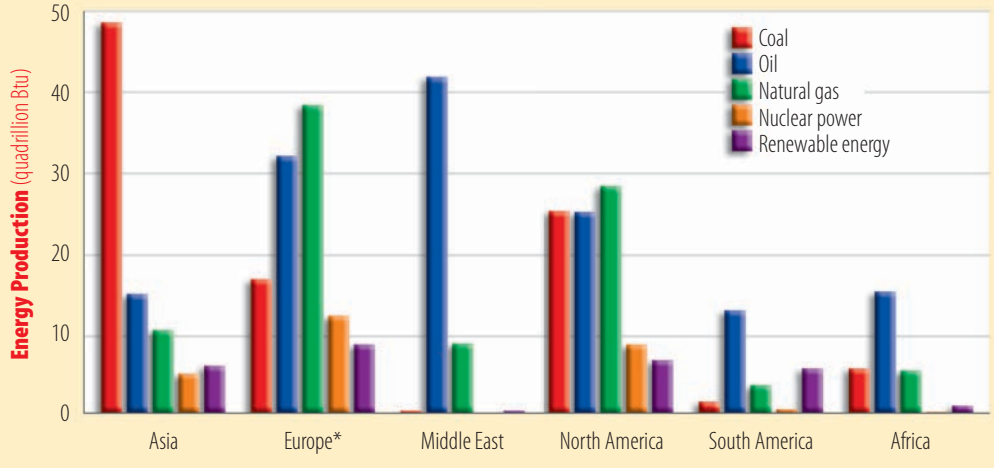
Unlike fossil fuels, renewable energy resources will not run out. They also are generally better for the environment. On the other hand, they are not available everywhere and can be costly.

The main alternative to fossil fuels is **hydroelectric power**—the production of electricity from waterpower. We obtain energy from moving water by damming rivers. The dams harness the power of moving water to generate electricity.

Hydroelectric power has both pros and cons. On the positive side, it produces power without polluting and lessens our use of fossil fuels. On the negative side, dams create lakes that replace existing resources, such as farmland, and disrupt wildlife habitats.

Another renewable energy source is wind. People have long used wind to power windmills. Today we use wind to power wind turbines, a type of modern windmill. At wind farms, hundreds of turbines create electricity in windy places.

World Energy Production



*includes the former Soviet Union

All countries need energy. Yet, energy resources are not evenly spread across Earth. As a result, energy production differs by region. For example, the Middle East has rich oil deposits. For this reason, the Middle East leads the world in oil production.

Interpreting Graphs
Which world region has the most balanced production of different types of energy?

A third source of renewable energy is heat from the sun and Earth. We can use solar power, or power from the sun, to heat water or homes. Using special solar panels, we turn solar energy into electricity. We can also use geothermal energy, or heat from within Earth. Geothermal power plants use steam and hot water located within Earth to create electricity.

Nuclear Energy

A final energy source is nuclear energy. We obtain this energy by splitting atoms, small particles of matter. This process uses the metal uranium, so some people consider nuclear energy a nonrenewable resource. Nuclear power does not pollute the air, but it does produce dangerous wastes. These wastes must be stored for thousands of years before they are safe. In addition, an accident at a nuclear power plant can have terrible effects.

READING CHECK **Drawing Inferences** Why might people look for alternatives to fossil fuels?

Mineral Resources

Like energy resources, mineral resources can be quite valuable. These resources include metals, salt, rocks, and gemstones.

Minerals fulfill countless needs. Look around you to see a few. Your school building likely includes steel, made from iron. The outer walls might be granite or limestone. The window glass is made from quartz, a mineral in sand. From staples to jewelry to coins, metals are everywhere.

Minerals are nonrenewable, so we need to conserve them. Recycling items such as aluminum cans will make the supply of these valuable resources last longer.

READING CHECK **Categorizing** What are the major types of mineral resources?

From the Ground to the Air

The photo shows a bauxite mine. Bauxite is used to make aluminum. This metal is used in many products, such as jet planes. See how many other products made from aluminum you can name.

Resources and People

Natural resources vary from place to place. The resources available in a region can shape life and wealth for the people there.

Resources and Daily Life

The natural resources available to people affect their lifestyles and needs. In the United States we have many different kinds of natural resources. We can choose among many different ways to dress, eat, live, travel, and entertain ourselves. People in places with fewer natural resources will likely have fewer choices and different needs than Americans.

For example, people who live in remote rain forests depend on forest resources for most of their needs. These people may craft containers by weaving plant fibers together. They may make canoes by hollowing out tree trunks. Instead of being concerned about money, they might be more concerned about food.

Products from Petroleum

This Ohio family shows some common products made from petroleum, or oil.

ANALYZING VISUALS What petroleum-based products can you identify in this photo?

Resources and Wealth

The availability of natural resources affects countries' economies as well. For example, the many natural resources available in the United States have helped it become one of the world's wealthiest countries. In contrast, countries with few natural resources often have weak economies.

Some countries have one or two valuable resources but few others. For example, Saudi Arabia is rich in oil but lacks water for growing food. As a result, Saudi Arabia must use its oil profits to import food.

READING CHECK Identifying Cause and Effect How can having few natural resources affect life and wealth in a region or country?

SUMMARY AND PREVIEW You can see that Earth's natural resources have many uses. Important natural resources include air, water, soils, forests, fuels, and minerals. In the next chapter you will read about the world's people and cultures.

Section 4 Assessment

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ONLINE QUIZ

Reviewing Ideas, Terms, and Places

1. **a. Define** What are **renewable resources** and **nonrenewable resources**?
   b. Explain Why is it important for people to manage Earth's natural resources?
   c. Develop What are some things you can do to help manage and conserve natural resources?
2. **a. Define** What are **fossil fuels**, and why are they significant?
   b. Summarize What are three examples of renewable energy resources?
   c. Compare Regions Look back at the graph of World Energy Production on page 70. How does energy production in the United States compare to energy production in the Middle East?
3. **a. Recall** What are the main types of mineral resources?
   b. Analyze What are some products that we get from mineral resources?
4. **a. Describe** How do resources affect people?
   b. Make Inferences How might a country with only one valuable resource develop its economy?

Critical Thinking

5. **Categorizing** Draw a chart like this one. Use your notes to identify and evaluate each energy resource.

Fossil Fuels	Renewable Energy	Nuclear Energy
Pros	Pros	Pros
Cons	Cons	Cons

FOCUS ON VIEWING myWriteSmart

6. **Noting Details about Natural Resources** What natural resources does the place you chose have? Note ways to refer to some of these resources (or the lack of them) in your weather report.