

Renewable and Nonrenewable Resources

Reflect

You use Earth's resources every day. When you eat cereal with milk for breakfast, you use resources from plants and from animals. When you ride the bus to school, you use energy (fuel) resources. When you take a drink of lemonade or iced tea, you use water resources.

A resource is anything on Earth that humans use. We can use some kinds of resources over and over. Other kinds of resources can run out. What are some examples of resources on Earth? What might happen if they run out? How can we keep them from running out?

What are renewable resources?

Renewable resources can be replaced in our lifetime by natural processes. Some renewable resources, such as plants and animals, provide food for humans. Other renewable resources, such as sunlight and wind, provide energy. What are some of our renewable resources?

- **Sunlight:** Sunlight is a renewable resource. The Sun will continue to shine for billions of years. We can use energy from the Sun in many important ways. Solar panels capture sunlight and turn it into electricity. Humans use this electricity to power homes and businesses.
- **Air:** Wind can be used to create electricity, too. Large windmills, called turbines, spin in fast-moving wind. The movement of the turbine's blades creates electricity.
- **Water:** Humans cannot survive without freshwater. The freshwater we use is replaced by water cycle.

water cycle: the process by which water moves between Earth's surface and the air



Wind blowing past these turbines (top) provides us with renewable energy. Carrots (bottom) are also an example of a renewable resource. Every year, new carrots grow. Humans use carrots as a source of food.



Renewable and Nonrenewable Resources

Reflect

Water is also a source of energy. Dams along rivers can use moving water to create electricity. The movement of water during tides can also provide energy.

- Plants and animals: Plants provide food, energy, and useful products for humans. For example, trees provide wood. Wood can be burned to heat a home. Wood can also be turned into paper or lumber. Plants such as corn, strawberries, and carrots provide food for many animals, including humans. Animals, such as fish and cows, also provide food.

What are non-renewable resources?

Non-renewable resources have a limited amount and natural processes cannot replace them in a human's lifetime. Many minerals (such as metals such as aluminum and iron) that we mine from the earth are non-renewable resources. These resources take a very long time to form. When we use these resources too quickly, they can run out because there is not enough time to replace them. A group of non-renewable resources, called fossil fuels, include coal, oil, and natural gas. They are named fossil fuels because they form from organisms that have died.

- Coal: Coal is a solid material that takes millions of years to form. Coal comes from plants that died millions of years ago. Some coal formations occur in areas that used to be swamps with moss and ferns. Thick layers of rocks and soil covered the dead plants. The pressure of the rocks and soil turned the plants into a solid called coal. Humans dig coal out of the ground. Burning coal releases its energy. We can use this energy to produce electricity.



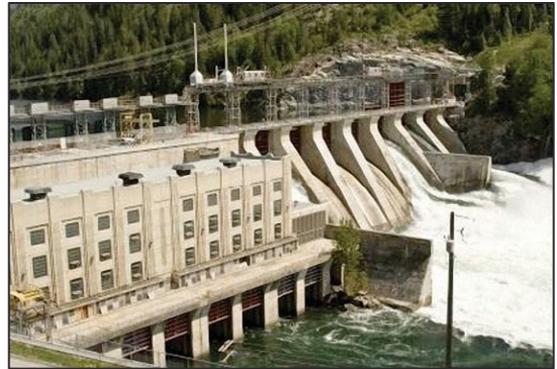
This machine, called a pump jack, pulls oil up from deep under Earth's surface.

- Oil: Oil is a liquid fuel that also takes millions of years to form. Oil comes from tiny animals that died in the ocean millions of years ago. Layers of mud pressed down on the dead animals. The pressure from the mud turned the dead animals into liquid, called oil. Oil can be turned into gasoline and other kinds of fuels. Oil is also used to make products such as plastics, DVDs, and tires.
- Natural gas: Natural gas is formed in the same way as oil. Over millions of years, tiny dead animals are pressed down by mud and rocks. The pressure forms tiny bubbles of gas. Natural gas has no smell, so scientists add a chemical to natural gas to make it smell like rotten eggs. This way, when there is a gas leak, people can detect it, get to safety and call the gas company to help. Natural gas is used to heat homes and cook food.

Renewable and Nonrenewable Resources

What Do You Think?

Look at the two photographs below. Are these examples of renewable or non-renewable resources? Explain your answer.



How can we conserve renewable and non-renewable resources?

Non-renewable resources cannot be replaced in your lifetime. If we use all the coal, oil, and natural gas on Earth, there will be none left. It will take millions of years to replace these resources. How can we conserve, or save, non-renewable resources? One solution is to use less coal, oil, and natural gas. Here are some ways we can use less of them: use public transportation instead of driving a car (this way, there are fewer vehicles using gasoline), turn the lights off when you leave a room, and use fabric bags instead of plastic bags at the grocery store.

Renewable resources also must be conserved. For example, trees can be used to make fuel, paper, and lumber. But what happens if you cut down all the trees in a forest? It will take many years for all of the trees to grow back. Humans should use some but not all of the renewable resources in an area. We should replace the resources we use as quickly as possible. For example, we should plant new trees to replace those that are cut down.



Some renewable and non-renewable resources can hurt the environment. Oil spills in the ocean can hurt or kill the animals living there. Burning coal releases gases and smoke into the atmosphere that can harm living things. Animal farms can create waste that drains into and pollutes rivers. One way to stop hurting the environment is to use less of these resources. We can find other ways to get energy that pollute less, with renewable resources such as solar and wind power.

Renewable and Nonrenewable Resources

Look Out!

Some products, such as gasoline or plastics, are made in special factories. You might think these resources are human-made and do not come from Earth. But all resources can be traced back to some natural material that came from Earth. Gasoline and plastic are made from oil. Oil is a non-renewable resource that comes from Earth.

Looking to the Future: Overfishing

Fish are an example of a renewable resource. Humans eat fish for food. The human population is very large. We have many people to feed. Better technology and bigger boats allow fishermen to catch more fish than we did hundreds of years ago. But, we may be catching too many fish.

Imagine that the ocean has 100 fish. What happens if we catch 90 of those fish? We will have lots of fish to eat. But only 10 fish are left to lay eggs and produce more fish.

These 10 fish cannot lay enough eggs to replace all of the fish we caught. The fish population will start to decrease. This kind of fish might even go extinct. This is an example of overfishing. Overfishing happens when humans catch too many fish in an area. The fish population cannot survive. We have seen evidence of this in the North Atlantic Ocean. In the 1990s, humans caught too many cod. A cod is a type of fish in the Atlantic Ocean. The population of cod became so small that cod almost went extinct. Scientists noticed the problem and stepped in. They recommended limits on the amount of cod that fisherman could catch. This allowed more adult cod to stay in the ocean and lay eggs. The population of cod began to grow again. Limiting the amount of fish that can be caught helps to keep fish populations healthy.



Renewable and Nonrenewable Resources

Try Now

Sunlight is an example of a renewable resource. Solar panels can convert sunlight into electrical energy. To do this, solar panels need to collect as much sunlight as possible. Try this short activity to learn more about solar panel design. You will need water, two foil pie pans, black construction paper, and two thermometers.

1. Cut a piece of black construction paper to fit into one of the pie pans. Place the construction paper at the bottom of the pie pan. Leave the other pie pan as it is.
2. Pour the same amount of water into each pie pan.
3. Record the temperature of the water in each pie pan.
4. Put both pie pans in direct sunlight. Leave them in the sunlight for 20 minutes.
5. After 20 minutes, record the temperature of the water in each pie pan.
6. In which pie pan did the temperature rise more? What does this tell you about how sunlight interacts with dark colors? If you were designing a solar panel, what color would you make it?



This house gets some of its energy from solar panels on its roof. The panels convert sunlight into electricity.

Renewable and Nonrenewable Resources

What Do You Think?

Use what you know about renewable and non-renewable resources to fill out the table below. First, decide if you agree or disagree with the statement in the left column. Then, explain why you agree or disagree in the right column.

Agree/Disagree?	Explanation
<p>Renewable resources cannot be replaced in our lifetime.</p> <p>_____ Agree</p> <p>_____ Disagree</p>	
<p>Solar power, natural gas, and wood are all non-renewable energy sources.</p> <p>_____ Agree</p> <p>_____ Disagree</p>	
<p>Both renewable and non-renewable resources should be conserved.</p> <p>_____ Agree</p> <p>_____ Disagree</p>	

Renewable and Nonrenewable Resources

Connecting With Your Child

Conducting a Survey

People use resources from Earth every day. Both non-renewable and renewable resources provide you with the energy, food, and products you need to live. Work with your child to create a survey that asks the people around you how they use Earth's resources. Here are some sample questions:

1. Describe how you heat your home. Do you use natural gas, oil, or another resource?
2. Where does the electricity in your home come from? Does it come from nuclear power, coal power, solar power, wind power, or another source?
3. Do you or your family members eat plant or animal products?
4. Are there any products in your home that come from non-renewable or renewable resources? These products could include plastics, DVDs and CDs, computers, cellophane tape, air mattresses, baby oil, disposable diapers, latex gloves, petroleum jelly, firewood, paper, toothpaste, etc.
5. How do you or your family try to conserve resources?

Try to construct questions that ask about both renewable and non-renewable resources. Conduct the survey with your neighbors, family members, or your child's classmates.

After the survey is completed, review the results with your child, and make a poster or pamphlet that describes the results.

Here are some questions to discuss with your child:

- How are people using non-renewable and renewable resources in their daily lives?
- Which resources are used most often?
- How are people conserving resources in their daily lives?