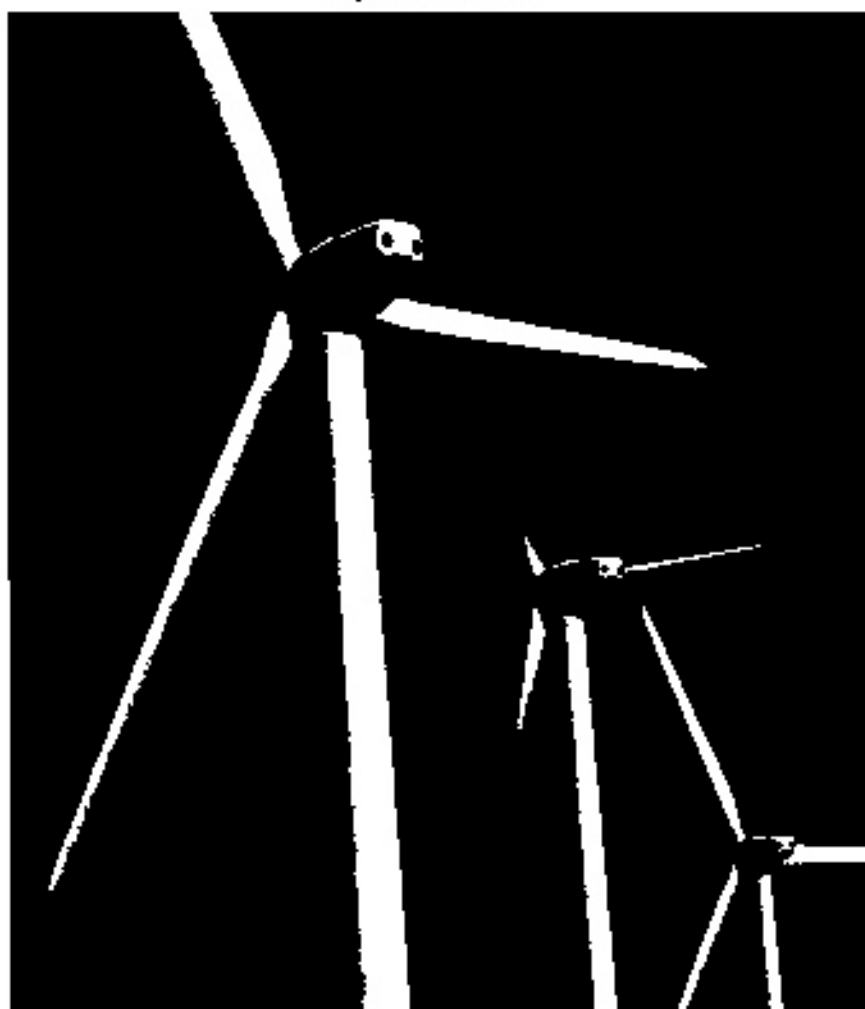


# Energy for Life

by ReadWorks



## **ENERGY IS THE KEY**

We use a lot of energy to live. Whether we're playing, studying or eating, energy makes these activities possible. We also use energy for production-to run machines, for instance. Much of this energy comes from fuels like oil, coal or natural gas. These fuels are used to make the blacktop and basketballs at recess, as well as generate the electricity for the lights all around you. Think of all the energy required to plant, grow, harvest, transport and cook your lunch, and you can start to understand that energy is a key to life!

## **NATURAL, BUT NOT FOREVER**

Fuels like natural gas, oil and coal are important natural resources. They are known as fossil

fuels and take millions of years to form. We've used them for hundreds of years, and they've powered everything from planes and trains to cars and computers. Unfortunately, fossil fuels are non-renewable forms of energy. Our power plants burn them faster than nature makes them, and when they are burned, power plants create emissions harmful to the environment.

To use fossil fuels, we first need to get them out of the earth with technologies like oil rigs, coal mines and natural gas wells. The drilling, mining and pumping of these natural resources often requires very large operations. These procedures result in producing the important energy we need, but they need fossil fuels themselves to operate and can often negatively impact the land where these fuels are found.

## **POWERING THE FUTURE**

Fortunately, there are forms of renewable energy out there. They also come from nature and don't harm the environment as much as fossil fuels. Furthermore, they aren't consumed to produce energy, so we can use them again and again. One form of renewable energy is solar energy. Solar energy uses solar panels, which collect sunlight and convert it directly into electricity.

Another form of renewable energy is wind energy. Like an extremely large pinwheel, wind turbines have blades that rotate when the wind blows, and this movement generates electricity. Some solar and wind energy power plants are connected to batteries so they can supply electricity even when the sun isn't shining or the wind isn't blowing.

One form of renewable energy that has been around for a very long time is hydropower. Hydropower is energy produced by falling and running water. Hydropower technologies can be as simple as a watermill on a stream or as complex as a hydroelectricity dam. Hydropower is a great source of renewable energy: in Washington state (in the USA), for instance, it produces approximately 75% of the entire state's energy!

## **THE RIGHT PLAN**

Using renewable energy is a good way to reduce our dependence on fossil fuels, though renewable energies have some negative impacts on the earth as well. Solar power plants are usually built in deserts where sunshine is reliable and strong, but the desert land that is disrupted for the construction and operation of these power plants is actually rich with plant and animal life.

Wind energy power plants are called wind farms and require a lot of land. Though each turbine only takes up a small area of land, wind farms can easily have hundreds or thousands of turbines. With that many turbines together, their presence can easily affect birds, bats and

other wildlife in the area.

Hydropower plants can generate a lot of energy and electricity, but their existence can dramatically alter the environment around them. Many hydropower plants use dams to create the electricity. Fish can be easily blocked by a dam and prevented from swimming to important spawning grounds. Dams can also fail and cause massive flooding. Also, in the event of a drought, the electricity produced could truly be limited to a trickle!

However, by carefully planning the locations of renewable energy power plants, their harmful impact to the planet can be minimized and their renewable and sustainable benefits maximized.

## **LOOKING FORWARD**

Almost everything we do requires some sort of energy. It's important to understand where our energy comes from, how it is produced and what effect each type has on our environment. As technology improves, we can balance the use of non-renewable fossil fuels with renewable energy for a healthier planet.

Name: \_\_\_\_\_ Date: \_\_\_\_\_

1. What do people use energy for?

- A. People use energy to cause massive floods.
- B. People use energy to create more oil and coal.
- C. People use energy to play, study, and live.
- D. People use energy to minimize sustainable benefits from the sun.

2. What does the passage compare and contrast with fossil fuels?

- A. The passage compares and contrasts playing, studying, and eating with fossil fuels.
- B. The passage compares and contrasts coal mines and natural gas wells with fossil fuels.
- C. The passage compares and contrasts Washington State with fossil fuels.
- D. The passage compares and contrasts forms of renewable energy with fossil fuels.

3. Humans use energy from several different sources.

What evidence from the passage supports this statement?

- A. People use energy to play, study, eat, make basketballs, and generate electricity.
- B. People use energy from natural gas, oil, coal, the sun, wind, and water.
- C. Wind turbines can affect birds, bats, and other wildlife around them.
- D. When a dam that produces hydropower fails, it can cause massive flooding.

4. What is true of all types of energy discussed in the passage?

- A. They are all non-renewable.
- B. They are all renewable.
- C. They all have some negative impacts on the earth.
- D. None of them has any negative impacts on the earth.

5. What is this passage mainly about?

- A. the importance of energy and where energy comes from
- B. watermills, dams, and other forms of hydropower
- C. planting, growing, harvesting, transporting, and cooking food
- D. the different ways children play and study

6. Read the following sentences: "Fortunately, there are forms of **renewable** energy out there. They also come from nature and don't harm the environment as much as fossil fuels. Furthermore, they aren't consumed to produce energy, so we can use them again and again."

What does the word **renewable** mean?

- A. harmful to the environment
- B. able to be used more than once
- C. produced by falling and running water
- D. made in the United States of America

7. Choose the answer that best completes the sentence below.

Wind is a form of renewable energy; \_\_\_\_\_, oil is not renewable.

- A. for example
- B. particularly
- C. soon
- D. on the other hand

8. Where does hydropower come from?

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**9. What effects does hydropower have on the environment?**

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**10. The passage states that it is "important to understand where our energy comes from, how it is produced and what effect each type has on our environment." Explain why understanding these things is important, using evidence from the passage.**

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# How Mountains Form

This text is excerpted from an original work of the Core Knowledge Foundation.

Mountains are formed in several different ways. To understand how mountains are formed, you need to remember that the Earth has a crusty shell made up of gigantic plates. These plates can shift, crack, and wrinkle.

Folded mountains are created when Earth's crust shifts. As it shifts, one piece of rock folds on top of another. The Himalayas (/him"uh"lae"uhz/) in Asia are folded mountains. Some of the Appalachian (/ap"uh"lae"chun/) Mountains in the eastern United States are folded mountains, too.



*Folded mountains are created when one piece of rock folds over another. Both the Himalayas (left) and the Appalachians (right) are folded mountains.*

Fault block mountains are also created by shifting plates. In this case, pieces of rock are broken off and driven upward by the force of the shifting plates. The Sierra Nevadas of western North America are fault block mountains.



photo: Cullen328 (CC BY 3.0); illustration: Core Knowledge

*Fault block mountains are created when pieces of rock are driven up. The Sierra Nevadas are fault block mountains.*

Dome mountains are created when melted rock called magma pushes up below the surface of the Earth. As the magma moves up, it makes bumps on Earth's surface.

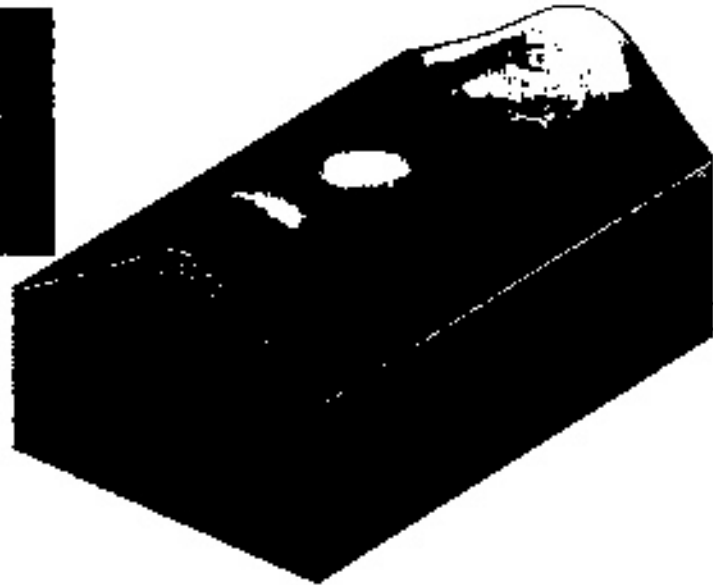


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*Magma pushing up below the surface of the Earth forms dome mountains. The Black Hills of South Dakota are dome mountains.*

These bumps often look more like hills than mountains. The Black Hills of South Dakota are dome mountains.

Volcanic mountains form when a volcano erupts and breaks a hole in Earth's crust. Lava and ash flow down the sides of the volcano and harden into a mountain. Many islands, such as the Hawaiian Islands, are actually the tops of volcanic mountains. Japan's highest mountain, Mount Fuji, is a volcano. It last erupted in 1707.



*Japan's Mount Fuji is a volcano.*



*Mountains sometimes form when a volcano erupts. The Hawaiian Islands are the tops of volcanic mountains.*

The highest mountain in Africa, Mount Kilimanjaro (/kil\*uh\*man\*iar\*oe/), is an extinct



(/ek\*stinkt/) volcano.

Volcanic mountains can be produced by a few days of huge eruptions. However, most mountains take thousands, or even millions, of years to form. They form so slowly that, in real life, you can't see them changing.

Some of Earth's mountains, such as the Appalachians, were formed more than two hundred million years ago. Others, such as the Rocky Mountains in western North America, were formed only about a million years ago. You can often tell whether mountains are young mountains or old mountains by their shape. Young mountains are usually steep, have a high elevation, and are often sharp or pointy. Old mountains have been worn down by many years of erosion (/er\*oe\*zhun/).

Look at the picture of Mount Everest. You'll notice that there is snow on top of the mountain. Most tall mountains are covered with snow all year long. That is because the farther above sea level you go, the colder it gets. We use the term sea level to explain land elevation in relation to the surface level of the world's oceans. You may have noticed this if you have ever hiked up a mountain or driven to the top of one.



*Mount Everest is the highest mountain in the world.*

Mountaintops are usually cold, even when they are located in hot places. Snow covers the top of Mount Kilimanjaro, in the African country of Tanzania (/tan\*zuh\*nee\*uh/), all year long even though it is very close to the equator.

Name: \_\_\_\_\_ Date: \_\_\_\_\_

1. How are folded mountains formed?

- A. Huge pieces of rock break off the Earth's crust when it moves, piling up to form mountains.
- B. Magma from below the Earth's crust pushes upwards, causing the crust to swell upwards.
- C. Lava erupts through the Earth's crust, forming a mountain of hardened lava.
- D. When the Earth's crust shifts, one piece of rock folds on top of another to form mountains.

2. In this passage, the author describes how mountains can change over time. Over time, what effect does erosion have on mountains?

- A. Erosion wears down mountains over time.
- B. Erosion makes mountains sharp and pointy over time.
- C. Erosion causes new mountains to form over time.
- D. Erosion causes mountain tops to hold more snow over time.

3. The text states that fault block mountains are formed when, "pieces of rock are broken off and driven upward by the force of the shifting plates." Based on this evidence, what conclusion can you draw about the force of Earth's shifting plates?

- A. The force of Earth's shifting plates is somewhat gentle.
- B. The force of Earth's shifting plates is loud.
- C. The force of Earth's shifting plates is very powerful.
- D. The force of Earth's shifting plates is created quickly.

4. Based on the information in the text, what is one feature of a mountain that a person could look at to draw conclusions about how that mountain formed?

- A. the color of the rock that makes up the mountainside
- B. how cold and snowy it is around the mountain
- C. how sharp and pointy or smooth and hilly the mountain is
- D. how quickly the rocks of the mountain are shifting

5. What is the main idea of this text?

- A. Mountains are all very cold, but they come in all shapes and sizes.
- B. Mountains can form in different ways and look different based on how they formed.
- C. Mountains can be made of rock, Earth plates, or lava.
- D. Mountains can form on land or in the ocean when volcanoes erupt and lava hardens.

6. Please read the following sentences from the text. "...the Earth has a crusty shell made up of gigantic plates. These plates can **shift**, crack, and wrinkle. Folded mountains are created when Earth's crust **shifts**. As it **shifts**, one piece of rock folds on top of another."

Based on these sentences, what does the word **shifts** mean?

- A. moves
- B. explodes
- C. shrinks
- D. shivers

7. Please choose the answer that best completes the sentence below.

Most mountains take thousand or millions of years to form, \_\_\_ volcanic mountains can be produced in just a few days.

- A. also
- B. before
- C. therefore
- D. but

**8.** The text says you can often tell whether mountains are old or young by their shape. What do young mountains usually look like?

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**9.** The text says, "Some of Earth's mountains, such as the Appalachians, were formed more than two hundred million years ago. Others, such as the Rocky Mountains in western North America, were formed only about a million years ago." Using evidence from the text, describe how these two mountain ranges might look different.

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**10.** Imagine you are going on a hike. In the distance, you see a huge, rocky mountain range with several pointed, snow-covered peaks at the top. What kind of mountains could these be? Use evidence from the passage in your answer.

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