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.

dependence de · pend · ance ; de · pend · ence

Advanced Definition

noun

1. the condition of being reliant on another for help, or to provide what one needs.
2. reliance; trust.
3. that which is relied upon.
4. the state of being conditioned or contingent upon something.
5. the state of being controlled or subjugated.

Spanish cognate

dependencia: The Spanish word *dependencia* means dependence.

These are some examples of how the word or forms of the word are used:

1. Pets are **dependent** on their owners for everything: food, companionship, and hygiene (cleanliness). Do you have enough time to devote to taking care of a pet?
2. The balloon has no propeller or engine, so Rodriguez can't change direction on his own-he's entirely **dependent** on the wind. The only thing he controls is altitude. He does this by changing the properties of two invisible gases: air and propane.
3. New technologies for tapping trees are always being developed so producers can extract more and more sap. However, some things are beyond their control. The amount of sap that a maple producer is able to collect in any given year is largely **dependent** on the weather.
4. The plan will allow India to reduce its **dependence** on fossil fuels, such as oil and coal. Fossil fuels are formed in Earth from plant and animal remains over millions of years. In addition, the United States and India will work together to develop new technologies for producing clean and safe energy.
5. Orchids and the insects that pollinate them are one of the most amazing examples of evolution. They are completely **dependent** on each other for survival, and scientists don't know which one came first. Most likely they evolved together.
6. A large number of different species (a great biodiversity) is one indicator of an ecosystem's health. Remarkably, biodiversity is not necessarily **dependent** upon the size of the ecosystem; some of the richest ecosystems in the world exist within narrow boundaries (sections of the Amazon rainforest, for example, and the Galapagos Islands).
7. Over the next thousand years, the people of the Southwest settled down gradually. They stopped living in caves and shallow pits, and began building homes. They moved from a strictly huntergatherer culture to one increasingly **dependent** on agriculture, growing beans and domesticating animals like turkeys. The more they farmed, the more water they needed, and they built dams, walls and other basic irrigation systems.
8. Bound feet forced women to hobble around and take extremely small steps. Many men found this shuffling sort of walk very attractive. Yet as a result of their compromised feet, women rarely participated in social or political life, often becoming very **dependent** on their husbands and families. Even this was seen as a virtue, for a woman who stayed at home was considered chaste and faithful to her husband.

generate gen · er · ate

Advanced Definition

transitive verb

1. to cause to be brought into being.

   The human body generates heat.

   The farm uses a windmill to generate its own electricity.

   The news generated a great deal of excitement.

   Establishment of the factory will generate more jobs in the area.

   The lottery generates significant revenue for the state.

2. to beget (offspring).

   Laboratory mice exposed to the chemicals were no longer capable of generating offspring.

Spanish cognate

generar: The Spanish word *generar* means generate.

These are some examples of how the word or forms of the word are used:

1. Many people in America are unfamiliar with life without electricity, but in Savannah's community people keep battery-powered flashlights and oil lamps stored in case the lights go out. Some people also use a generator-a machine that **generates** electricity from gasoline-whenever there are emergencies. Savannah's family uses a wood stove during winter storms for cooking and warmth.
2. If you're walking in the woods and you see a bear, your brain, having received the image of the bear through the eye's optic nerve, may start producing chemical compounds called hormones. Amongst other things, hormones affect moods and many behaviors. In this case, the brain will likely produce a hormone that **generates** the feeling of fear.
3. Similarly, a tsunami could be **generated** by a giant meteor splashing into the ocean from outer space. Or a volcanic eruption in an underwater volcano. And yet the most common causes of tsunamis remain underwater earthquakes.
4. Can you imagine such a thing as "preGearth" space? It's a pretty heavy concept. But imagine the part of the universe where the earth would soon be, but wasn't yet. There, when the hot

gases and particles were pulled together by gravity to create the early earth, immense heat was **generated**, and the resulting planetary core continues to cool to this day, radiating heat outward.

5. One of the reasons hydropower is preferred over most other methods people can use to **generate** energy is because it is clean and safe, though it does have its drawbacks.

6. And so it was that all of the men were crowded into the room watching a long grey cable. An air conditioner hummed in the background, fighting against both the heat outside, and the heat **generated** by the massive machine in the room.

7. Waves can be caused by many things, both natural and manmade. Tides can be caused by the moon, which has an influence on the ocean's motion. Waves are also frequently caused by weather. For example, winds **generated** by a hurricane can create waves.

renewable re · new · a · ble

Advanced Definition

adjective

1. able to be revived, regenerated, or restored to an original state or condition.

As bamboo grows fast, it is a highly renewable resource.

This license is good for three years and is not renewable.

These are some examples of how the word or forms of the word are used:

1. Solar energy is a clean form of energy, as is wind energy, captured by turbines and windmills and channeled into grids. These are both alternatives to fossil fuels, which pollute the environment. Wind and solar energy are both **renewable** and clean.
2. Since the task is to build a sustainable building, we should consider sustainable energy sources. It might be easier to use non-**renewable** energy (which is considered less sustainable than renewable energy), because it's often more readily available. However, our task is to create a sustainable building, so we need to find sustainable energy sources. Solar panels could be an option, if we are building in a sunny area.
3. Half a percent of the water is too far underground to be reached, which leaves about half a percent of fresh water for all the people and animals on Earth. Fresh water does not have any salt in it. Earth's fresh water supply is **renewable** only by precipitation, such as rain, sleet, or snow.
4. Believe it or not, soil is actually a valuable and **nonrenewable** resource, as it contains nutrients and minerals crucial for agricultural productivity. It takes thousands and thousands of years to build up enough soil in a region for the land to be productive, but erosion can wear it away much faster than that, especially at the rate it has been occurring in recent decades.
5. Fossil fuels are coal, oil, and natural gases that were created millions of years ago. Fossil fuels are not a **renewable** energy source; once they are used up, they are gone forever.
6. Luckily, there are some **renewable** energy sources we can use, that we can keep using. Unlike non-renewable fossil fuels, they will not run out. Three forms of renewable fuels are solar (coming from the sun) energy, water energy and wind energy.
7. Fossil fuels are gradually being used up. To conserve them, scientists are looking to **renewable** energy sources. Renewable energy is power from sources that can't be used up and do not pollute the environment. Water, wind, and solar power are types of renewable energy.

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?

9. What effects does hydropower have on the environment?

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.