FOSSIL FUELS

Plants and fuel have a strong connection to the Earth. All plants get their energy from the Sun through a process called **photosynthesis**. People get energy from the plants and animals they eat. Indirectly then, the energy all animals need comes from the Sun.

In addition, homes need the energy to power them with electricity and heat. The energy is provided by a power plant, which also uses fuel that often comes from coal or natural gas. The fuels provide energy. All energy comes from the Sun. If all energy comes from the Sun, then it is logical to say that oil, natural gas, and coal would not be possible without the energy from the Sun.

However, as plants and people use energy from the Sun immediately, the energy used for vehicles, homes, and businesses comes from fuel that has taken millions and millions of years to be developed and processed. Oil, natural gas, and coal are called **fossil fuels**.

Fossils can be the ancient remains of plants and animals. About 300 million years ago, the Earth was mostly covered with extremely dense forests and swamps. There were no people cutting down trees or eating food for energy from the plants. However, the energy did not leave the plants when they died. When the plants and animals died, they would slowly decay, and then over time become buried under layers and layers of soil, mud, silt, or sand. Due to high temperatures and the extreme pressure on the remains, the once living things were transformed into fossil fuels.

In the United States, coal is the most abundant fossil fuel. **Coal** is a combustible (burnable) black or brown rock made up of carbonized plant matter. In other words, coal is a rock that has come from those dead and decaying plants from millions and millions of years ago. Today, it is burned and used for energy.

Coal has been used longer and more often than any other fossil fuel. Humans have been using it for hundreds or possibly thousands of years. One of its earliest uses was powering steam engines in trains. Coal is burned at power plants to produce electricity and used in the production of plastics, tar, fertilizers, and some medicines. As with all fossil fuels,

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coal is a **nonrenewable** energy source. It is classified as nonrenewable because it takes millions of years to form.

Crude oil was also formed from plants and animals that lived millions of years ago, but it exists in liquid form in underground pools or reservoirs. Most oil deposits began forming at the bottom of the ocean's surface. It is found in tiny spaces within sedimentary rocks or near the surface in tar or oil sands.

One of the best areas in the world where crude oil formed is the land in the Middle East and North Africa. At one time, this land was covered by the ancient Tethys Ocean. Due to plate tectonics and the changes in the Earth's crust, the ocean no longer exists, but the giant oil basins in the region remain.

Oil is a nonrenewable energy source and it too has problems associated with it. When it is burned, it gives off dangerous greenhouse gases contributing to global warming and acid rain. Car exhausts release gases into the air leading to diseases such as cancer and asthma, as well as causing damage to buildings.

The third nonrenewable fossil fuel is natural gas, a flammable gas consisting largely of methane and other hydrocarbons. It occurs naturally underground in the same manner as the crude oil; the decayed plants and animals transformed into coal, oil, or natural gas. The gas moved into large cracks and spaces between layers of overlying rock and can be found in coal deposits.

Natural gas is relatively a clean-burning fossil fuel and results in fewer emissions of nearly all types of air pollutants and carbon dioxide than coal or oil. If natural gas does leak into the atmosphere it adds to the greenhouse gases. If a leak occurs in an area where natural gas is produced, it is safer to burn off the gas than to allow the methane gas to escape into the Earth's atmosphere.

In the United States, the three major fossil fuels account for 78% of the country's energy production. The remaining production: 12% is from renewable energy sources such as solar power and 10% from nuclear electric power. Though each fossil fuel has advantages, the fossil fuels can also cause problems for the environment.

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1) Ultimately, where does all energy come from that plants and animals use?

- **A:** Coal
- **B:** Natural gas
- **C:** Oil
- **D:** The sun

2) Which of the following is the most abundant fossil fuel found in the United States?

- **A:** Coal
- **B:** Natural gas
- **C:** Oil
- **D:** None of the above

3) Which of the following is necessary for decayed plants and animals to be transformed into energy?

- **A:** Millions of years
- **B:** High temperatures
- **C:** Extreme pressure
- **D:** All the above

4) Which of the following fossil fuel is found in liquid form?

- **A:** Coal
- **B:** Natural gas
- **C:** Crude oil
- **D:** Both A and C

5) One of the best areas in the world where crude oil may be found is in which of the following places?

- **A:** The Middle East and North Africa
- **B:** Europe and China

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- **C:** The United States and Canada
- **D:** South America and Africa

6) Which of the following fossil fuels is relatively clean-burning?

- **A:** Coal
- **B:** Natural gas
- **C:** Crude oil
- **D:** Both A and C

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