

Earth's Natural Resources: Mineral, Energy, and Groundwater

Natural resources are materials found in nature that people use for many purposes, such as building, powering machines, and providing clean water. This reading will explore three major types of Earth's natural resources: **mineral resources**, **energy resources**, and **groundwater**. Each plays a critical role in our daily lives and is shaped by geologic and environmental processes.

What Are Mineral Resources?

Mineral resources are naturally occurring solid substances found in Earth's crust.

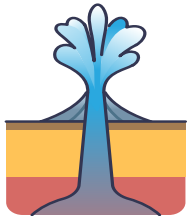
TWF SAMPLE



How Are Mineral Resources Formed?

Minerals form deep underground under intense **heat**, **pressure**, and **chemical**

reactions. One major way minerals are created is through **volcanic activity**.



When magma moves toward the surface, it carries hot, mineral-rich fluids. As these fluids cool, they leave behind deposits of metals and other minerals. Another important process happens near **hydrothermal vents**, where extremely hot water from beneath the Earth's crust rises and deposits minerals as it cools. These minerals collect in **ore deposits**, which are concentrated areas where mining can take place.

Where Are Mineral Resources Found?

Mineral resources are not evenly spread across the planet. Their location depends on past geologic processes, such as volcanic activity and movement of tectonic plates. For example, **copper** is often

TWF SAMPLE

Mining and Human Impact

To get minerals out of the ground, we use different types of **mining**. In **surface mining**, machines remove the top layers of soil and rock to reach minerals close to the surface. In **underground mining**, workers dig deep tunnels to reach minerals far below. Both types of mining can damage the



land, harm plant and animal life, and cause **pollution**. Mining also uses a lot of water and energy, which can stress local environments.

Sustainability and Recycling

Since minerals are non-renewable and mining has environmental costs, it's important to think

TWF SAMPLE

What Are Energy Resources?

Energy resources are materials that provide power to run our homes, schools, vehicles, and factories. The most commonly used energy resources are **non-renewable**, such as **fossil fuels** and **nuclear energy**. Fossil fuels—coal, oil, and natural gas—come from ancient plants and animals that were buried millions of years ago. **Nuclear energy** is made using uranium, a metal found underground. Renewable resources like solar and wind are becoming more popular, but we still rely heavily on non-renewables.



How Do Fossil Fuels Form?



Fossil fuels form from the remains of dead plants and animals. Over millions of

TWF SAMPLE

Where Are Energy Resources Found?

Fossil fuels are found in certain areas of the world, not everywhere. **Oil and gas** often form where ancient ocean life was buried. These fuels get trapped in rocks deep underground, in spaces that act like sponges. Countries like **Saudi Arabia**, the **United States**, and **Russia** have some of the largest supplies. Because these fuels are not evenly spread across the Earth, some countries depend on others for energy.

How Do We Extract and Use Them?

To get fossil fuels, we use **drilling** to reach oil and gas underground. Once oil is brought to the surface, it goes to a **refinery**, where it is cleaned and



TWF SAMPLE

Environmental and Social Impact

Burning fossil fuels releases **carbon dioxide**, a gas that contributes to **climate change**. It also causes **air pollution**, which can harm human health. Accidents like oil spills can pollute rivers and

TWF SAMPLE

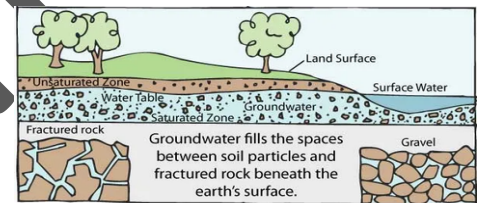
What Is Groundwater?

Groundwater is

TWF SAMPLE

How Does Groundwater Form and Move?

Groundwater forms when **rain and snow** soak into the ground. This process is called **infiltration**. Water moves slowly through the spaces in rocks and soil. The water cycle helps refill aquifers, but this process can take a long time. How easily water moves underground depends on the **porosity** (amount of spaces) and **permeability** (how easily water flows) of the rocks.



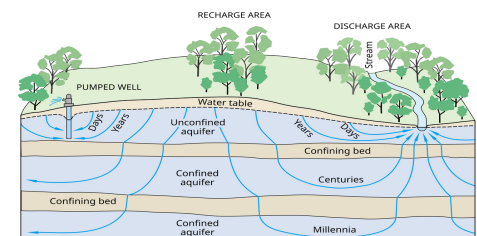
Where Is Groundwater Found?

Groundwater is stored in two types of aquifers

TWF SAMPLE

How Do We Use Groundwater?

People use groundwater for many things. We **drink** it, **water crops**, and use it in **factories**. To reach groundwater, people dig **wells** and use **pumps** to bring it to the surface. In many places, groundwater is the main source of water for homes and farms.



Problems and Protection

There are several problems with groundwater. **Overuse** can cause wells and rivers to dry up. **Contamination** from chemicals, farming, or waste can make it unsafe to drink. That's why we need to **conserve** groundwater by using less, fixing leaks, and keeping pollution out. Protecting groundwater is important for the health of people and the planet.

Understanding mineral,

TWF SAMPLE

Reading Comprehension Questions

1. What are
2. How are mineral resources formed deep underground?
3. Why are mineral resources considered non-renewable?
4. What are
5. Where do
6. What happens to oil after it is drilled from the ground?
7. What are two
8. What is groundwater and how is it different from surface water?
9. How do
10. What are two ways we

Extension Questions

1. What are some modern technologies or methods used to reduce the environmental impact of mining?
2. Compare
3. How are renewable energy sources like wind and solar power used in your area?
4. What are some
5. How does
6. What laws or regulations exist in your country to

Reading Comprehension Questions KEY

TWF SAMPLE

Extension Questions KEY

TWF SAMPLE

TWF Sample