

Name: _____

Period: _____ Date: _____

What Is a Mineral?

Read this passage and answer the questions that follow.

To be classified as a mineral, a substance must be a crystalline solid. It also must be inorganic and form through natural processes. In addition, it must have a definite chemical composition. Each of these properties is described next.

A crystalline solid is a substance that forms crystals. A crystal is a solid structure in which atoms or ions are arranged in a regular, repeating pattern. A given mineral always forms crystals with the same pattern of atoms or ions.

An inorganic substance is a substance that is not made by living things. (Organic substances, such as carbohydrates and proteins, are made by living things.) Both diamond and coal consist mainly of carbon. Diamond is a mineral, but coal is not. Coal looks like a mineral, but it is organic. It is a rock made of once-living things.

Minerals are made by natural processes that occur on or under Earth's surface. For example, diamond is created deep in Earth's crust when carbon is put under extreme pressure. Artificial "diamonds" can be made in a lab, by placing carbon under high pressure. However, artificial "diamonds" are not really minerals.

Some minerals, including gold and diamond, are made of single elements. But most minerals are chemical compounds that are made of two or more elements. Different minerals may contain many of the same elements. Elements commonly found in minerals include oxygen, silicon, and calcium. However, each mineral has a specific chemical composition. For example, halite is made of equal numbers of sodium and chloride ions. Quartz is always made of one silicon atom for every two oxygen atoms.

Questions

1. What is a **mineral**?
2. Describe a **crystalline solid**.
3. Contrast **organic** and **inorganic** substances.
4. **Diamond** and **coal** both consist of carbon. Why is diamond a mineral whereas coal is not?