

Name:

Date:

Block:

Properties of Minerals

Use the reading packet to answer the questions and fill in the notes below.

QUESTION 1: How do you think calcite hardened to form stalactites and stalagmites in the cave?

Defining Minerals

A _____ is a naturally occurring solid that can form by inorganic processes and that has a crystal structure and a definite chemical composition.

- Naturally Occurring: Minerals are formed by natural processes, such as magma _____ or _____ remains being subjected to intense pressure.
- Solid: Minerals are solid, with a definite _____ and _____ because the particles are packed together very tightly.
- Forms by Inorganic Processes: Minerals must be able to form from materials that were not a part of _____ things (but some can also be produced by living things).
- Crystal Structure: Mineral particles line up in a pattern that _____ over and over again. A crystal has flat sides, called faces, that meet at sharp edges and corners.
- Definite Chemical Composition: A mineral always contains certain _____ in definite proportions. (An element is a substance composed of a single kind of atom.)

COMPLETE THE CHART:

Mineral Characteristics	Quartz	Coal
Naturally occurring	✓	✓
Can form by inorganic processes		
Solid		
Crystal structure		
Definite chemical composition		

QUESTION 2: Are quartz and coal minerals or only naturally occurring substances?

Minerals, Compounds, and Elements

- Almost all minerals are _____: two or more elements are combined so that the elements no longer have distinct properties.
- Different minerals have a different _____ of elements.
- Some elements occur in nature in a _____ form, and not as part of a compound.

QUESTION 3: What makes a process inorganic?

QUESTION 4: Amber is a material used in jewelry. It forms only by the process of pine tree resin hardening into stone. Is amber a mineral? Explain.

How Are Minerals Identified?

Each mineral has characteristic properties that can be used to identify it.

- **Color:** Only a few minerals have their own _____ color.
- **Streak:** The color of a mineral's _____ when it is rubbed along a streak plate. Always the same for a specific mineral, it does not always match the _____ of the mineral.
- **Luster:** How _____ is reflected from a mineral's surface (metallic, glassy, earthy, silky, waxy, pearly).
- **Hardness:** Can be determined by a scratch test because a mineral can scratch any mineral softer than itself and can be scratched by any mineral harder than itself. The _____ ranks the hardness from 1 to 10.
- **Density:** Mass in a given space; or mass per unit volume. To measure density, scientists measure the mass of the mineral on a _____, then place it in water to determine the volume it _____. The density is then calculated using density = mass divided by volume.
- **Crystal Structure:** Geologists classify crystals by the number of faces, or sides, on the crystal. They also measure the _____ at which the faces meet.
- **Cleavage:** A property a mineral has if it splits easily along flat surfaces, depending on how the _____ in its crystals are arranged.
- **Fracture:** Describes how a mineral looks when it breaks apart in an _____ way.
- **Special Properties:** Some minerals bend _____, conduct electricity, glow when placed under ultraviolet light, or are _____.

QUESTION 5: Which is more useful when identifying a mineral: the mineral's color or the mineral's streak? Why?

QUESTION 6: You find a sample of the mineral magnetite. The sample has a mass of 151.0 g and a volume of 29.0 cm³. What is the density of magnetite?

QUESTION 7: What 2 features do geologists use to classify crystals?

QUESTION 8: Which properties do scientists use to identify minerals?

QUESTION 9: Lodestone is magnetic. How might you identify whether a mineral sample might be lodestone?

How Do Minerals Form?

A _____ is a rounded, hollow rock that is often lined with mineral crystals. Geologists believe these probably form when water containing dissolved minerals seeps in through a crack in a hollow rock.

_____ is the process by which atoms are arranged to form a material that has a crystal structure.

Minerals can form in 3 ways:

- From organic _____
 - Clams and corals produce shells and skeletons made out of the mineral _____. (Remember that calcite is also produced inorganically, so it is a mineral.)
- Crystallize from materials _____ in solutions
 - A _____ is a mixture in which one substance is dissolved in another.
 - Some minerals form when solutions _____.
 - Some minerals form when a hot water solution cools and the minerals come out of solution. This often forms a _____-a narrow channel or slab of a mineral that is different from the surrounding rock.
- Crystallize as magma and lava _____
 - When magma cools inside the crust or lava hardens on the surface, it forms _____.
 - The size of the crystals depends on several factors: cooling _____, amount of _____, and chemical _____.
 - Magma that cools deep below the surface cools very _____, forming large crystals.
 - Lava cools quickly at the surface and forms _____ crystals.

Where Mineral Resources are Found

- Earth's crust is made up mostly of the common _____ minerals combined in various types of rock.
- Less common minerals are not found evenly throughout the crust.
 - Several processes can _____ these minerals, or bring them together, in deposits.
 - An _____ is a deposit of valuable minerals contained in rocks.
 - Ores are mined and valuable metals/elements are separated from the rock.

QUESTION 10: What are the 3 general ways minerals form?