

# IS IT A MINERAL?

On the table in front of you are a variety of objects. Using the definition of a mineral provided, determine whether each object is a mineral (yes or no) and why or why not. An example is provided.

<u>Substance</u>	<u>Mineral</u>	<u>Why or Why Not?</u>
Window glass	no	no regular internal structure
Amber	_____	_____
Coal	_____	_____
Diamond	_____	_____
Ice	_____	_____
Pearl	_____	_____
Pepper	_____	_____
Pyrite (Fools Gold)	_____	_____
Salt	_____	_____
Sugar	_____	_____
Water	_____	_____

➤ *Minerals are inorganic, naturally occurring homogenous solids, with definite chemical compositions, and ordered (crystalline) atomic arrangements.*

**Inorganic:** Involving neither organic life nor the products of organic life

**Naturally Occurring:** Formed by natural processes, i.e., not in a laboratory

**Homogeneous Solid:** chemically and physically uniform down to the atomic level. This homogeneity means that the mineral will have absolutely predictable physical properties (e.g., hardness, density, streak).

**Definite Chemical Composition:** The atoms, or groups of atoms, that make up the mineral must occur in specific ratios.

**Ordered Atomic Arrangement (Crystalline):** Crystalline materials are three-dimensional arrays of precise geometric arrangement of atoms. Glasses such as obsidian, which are disordered solids, liquids (e.g., water, mercury), and gases (e.g., air) do not have a crystalline structure and are therefore not minerals.

Want some more definitions?

- "A mineral is an element or chemical compound that is normally crystalline and that has been formed as a result of geological processes" (Nickel, E. H., **1995**).
- "Minerals are naturally-occurring inorganic substances with a definite and predictable chemical composition and physical properties." (O' Donoghue, **1990**).
- "A mineral is a naturally occurring homogeneous solid, inorganically formed, with a definite chemical composition and an ordered atomic arrangement" (Mason, et al, **1968**).
- "These... minerals ...can be distinguished from one another by individual characteristics that arise directly from the kinds of atoms they contain and the arrangements these atoms make inside them" (Sinkankas, **1966**).
- "A mineral is a body produced by the processes of inorganic nature, having usually a definite chemical composition and, if formed under favorable conditions, a certain characteristic atomic structure which is expressed in its crystalline form and other physical properties" (Dana & Ford, **1932**).
- "Every distinct chemical compound occurring in inorganic nature, having a definite molecular structure or system of crystallization and well-defined physical properties, constitutes a mineral species" (Brush & Penfield, **1898**).