

Unit 2 (Q4): Rocks & Minerals Study Guide

Summary:

- **MINERALS** (and elements) are the building blocks of **ROCKS**. **MINERALS**, like all pure substances (elements, compounds), have unique chemical compositions (ingredient lists). Minerals are also all: solid, natural, crystalline, and inorganic (*not organic, not living*).
- **MINERALS** can **CRYSTALLIZE** (form crystals) out of hot solutions of magma, lava, or water. Minerals can also crystallize by evaporation of water, leaving the mineral crystals behind.
- **ROCKS** are classified (grouped) by **TEXTURE**, color, and composition (what they are made of). There are three major kinds of rocks: **IGNEOUS**, **SEDIMENTARY**, and **METAMORPHIC**.
- **ROCKS** are always, if slowly, changing due to natural forces (erosion, heat, pressure) of the **ROCK CYCLE**.
- The **MINING** of rocks and minerals is a very important industry as it supplies the ingredients that modern life relies on. However, mining is very dangerous, heavily polluting (air, water, and soil), and can sometimes lead to human rights abuses (conflict minerals) or power struggles between nations (rare earth minerals).

Important Vocabulary: element, mineral, rock, igneous rock (extrusive & intrusive), sedimentary rock (clastic, chemical, & organic), metamorphic rock (foliated & nonfoliated), sediment, erosion, deposition, compaction, cementation, ore, conflict minerals, rare earth minerals

	IGNEOUS	SEDIMENTARY	METAMORPHIC
Types	extrusive (volcanic) vs intrusive (plutonic)	clastic vs chemical vs organic	foliated vs nonfoliated
Origin	cools & hardens from molten material	(in order) erosion, deposition, compaction, cementation	existing rock put under intense heat & pressure
Examples	granite, pumice, obsidian, basalt, scoria	conglomerate, coal, halite, sandstone, limestone, flint	quartzite, shale, marble, gneiss, slate, schist

Concepts:

- What characteristics do geologists look for when studying a rock sample?
- What are the small particles of minerals or rock that make up rocks called?
- These small particles affect the look and feel of a rock, which is called the rock's _____.
- What is a fine-grained texture? What is a coarse-grained texture? How do these different textures form?
- What does a layered (banded, foliated) texture look like?
- Remember oceanic crust is mostly basalt, and continental crust is mostly granite. So, what major type of rock makes up most of Earth's crust (igneous, metamorphic, sedimentary)?
- Elements are a type of pure substance. What are elements made of?
- Minerals are a type of compound, which is also a type of pure substance. What are minerals made of?
- Rocks are not pure substances? What are they?
- How do intrusive igneous (plutonic) rocks form? How do extrusive (volcanic) igneous rocks form?
- What are organic sedimentary rocks made of? Where do the mineral crystals in chemical sedimentary rock come from? What is lithification?
- What is metamorphism? Where on (or in) the Earth are most metamorphic rocks formed? Can a metamorphic rock be changed into a new type of metamorphic rock?
- What is the difference between a gemstone and a gem? Do we use gemstones for things other than jewelry?
- Why are metals so important that we named an era of history after one of them (the Bronze Age)?
- Does modern society truly rely on minerals and the mining of them from the Earth?
- What is an ore? What is an alloy? Would you like a job as a miner? Why or why not?
- Why are people all over the world concerned about so-called "conflict minerals"? What are they?
- Why is our government concerned that China has 90% of the world's rare earth elements? What are they?