

Minerals Short Study Guide

Multiple Choice

Identify the letter of the choice that best completes the statement or answers the question.

- ____ 1. Minerals always exist in a(n) ____ form.
- liquid
 - gaseous
 - solid
 - organic
- ____ 2. The most abundant elements in Earth's crust are ____.
- aluminum and potassium
 - halite and coal
 - oxides and carbonates
 - oxygen and silicon
- ____ 3. Silver, gold, and copper have shiny surfaces and thus are said to have ____.
- dull luster
 - metallic luster
 - waxy luster
 - nonmetallic luster
- ____ 4. Ores near Earth's surface generally are obtained from ____.
- waste-removal facilities
 - underground mines
 - open-pit mines
 - bodies of water with high concentrations of dissolved minerals

Matching

Match each item with the correct statement below.

- | | |
|------------|-------------|
| a. crystal | d. mineral |
| b. gem | e. ore |
| c. magma | f. silicate |
- ____ 5. Naturally occurring, inorganic solid with specific chemical composition and crystalline structure
- ____ 6. Solid in which the atoms are arranged in repeating patterns
- ____ 7. Mineral that contains silicon and oxygen
- ____ 8. Mineral that contains a useful substance that can be mined for profit
- ____ 9. Valuable mineral prized for its rarity and beauty

Short Answer

10. Explain the meaning of the terms *naturally occurring* and *inorganic* as they relate to mineral characteristics.

Compare and contrast each pair of related terms or phrases.

- density, specific gravity
- luster, streak
- What accounts for the large diversity of silicates?

14. Why is color one of the least reliable tests for identifying minerals? Give an example to support your answer.
15. What conditions typically result in the formation of large, well-shaped mineral crystals?
16. Why do geologists usually use a combination of tests to identify a mineral?
17. Which mineral would react to iron filings—magnetite or graphite? What special property would that mineral have?
18. What three factors should be considered before mining a newly found mineral deposit?

Use this table for the six mineral samples to answer the following questions.

Mineral	Specific Gravity	Chemical Formula	Breakage Pattern
Gold	19.3	Au	Hackly
Apatite	5	Ca ₅ (PO ₄) ₃ (F, OH, Cl)	Uneven fracture
Pyrite	5.2	FeS ₂	Uneven fracture
Garnet	3.5–4.3	(Mg, Fe, Ca) ₃ (Al ₂ Si ₃ O ₁₂)	Conchoidal fracture
Beryl	2.75	Be ₃ Al ₂ Si ₆ O ₁₈	Uneven fracture
Corundum	4	Al ₂ O ₃	Fracture

19. List the six minerals in order from most dense to least dense.

Problem

Three pairs of mineral samples are brought to you for testing. Both samples in one pair look like gold, but one is pyrite, or fool's gold. Both samples in the second pair look like emeralds, but one is nonprecious apatite. Both samples in the third pair look like rubies, but one is a less valuable garnet. Use the information in the table to complete the dichotomous key to identify each mineral.

Mineral	Color	Hardness
Gold	Metallic gold	2.5–3
Apatite	Blue, green	5
Pyrite	Metallic pale brass, gold	6–6.5
Garnet	Red, deep red, brown	6.5–7.5
Beryl	Bluish green, green	7.5–8
Corundum	Red, deep red	9

20. Which mineral can scratch at least one of the green stones?

Name: _____

ID: A

21. Which mineral can scratch neither green stone?
22. Which mineral can scratch at least one of the red stones?
23. Which mineral can scratch neither red stone?
24. Which mineral can scratch both green stones?

Minerals Short Study Guide Answer Section

MULTIPLE CHOICE

1. C
2. D
3. B
4. C

MATCHING

5. D
6. A
7. F
8. E
9. B

SHORT ANSWER

10. A naturally occurring substance is one that is made by natural processes. Thus, a substance developed in a lab, such as a synthetic diamond, cannot be considered a mineral. An inorganic substance is one that is not alive nor has ever been alive. Therefore coal, formed by an organic process, is not a mineral.
11. Density is the ratio of the mass of a substance divided by its volume. Specific gravity is the most common measure of density. It is the ratio of the weight of a substance to the weight of an equal volume of water.
12. Both are tests used to identify a mineral. Luster is the way a mineral reflects light from its surface, while streak is the color of a mineral when it is broken up and powdered.
13. A silica tetrahedron has the ability to share oxygen atoms with other tetrahedrons. This allows elements to combine chemically and structurally in many ways.
14. Color is not a reliable test because a lot of minerals have the same color and can be mistaken for one another. Pyrite and gold, for example, cannot be distinguished by color alone.
15. Large, well-shaped crystals tend to form from magmas that cool slowly in an unrestricted space.
16. Some minerals have characteristics similar to other minerals. Therefore, more than one test may be necessary to accurately identify the minerals.
17. Magnetite would react to the iron filings. It is naturally magnetic.
18. Answers may vary. Students may say the cost of mining the mineral, the demand for the mineral, and the environmental impact of the mine. Accept all reasonable answers.
19. gold, pyrite, apatite, garnet, corundum, beryl

PROBLEM

20. pyrite
21. gold
22. beryl
23. apatite
24. corundum