

Chapter 2 Minerals

Study Guide

1. Properties of Minerals

a. What is a **Mineral**?

- i. Naturally Occurring
- ii. **Inorganic**
- iii. Solid
- iv. Crystal Structure
 1. **Crystal**
- v. Definite Chemical Composition
 1. **Element**
 2. **Compound**
 3. **Mixture**

b. Identifying Minerals

- i. Hardness
 1. **Mohs hardness scale**
- ii. Color
- iii. **Streak**
- iv. **Luster**
- v. **Density**
- vi. Crystal Systems
- vii. **Cleavage and Fracture**
- viii. Special Properties
 1. **Fluorescence**

2. How Minerals Form

- a. Processes that form Minerals
- b. Minerals from Magma
 - i. **Magma**
 - ii. **Lava**
- c. Minerals from hot water Solutions
 - i. **Solution**
 - ii. **Vein**

d. Minerals formed by Evaporation

e. Where Minerals are Found

3. Mineral Resources

a. The Uses of Minerals

i. **Gemstones**

ii. Metals

iii. Other useful Minerals

b. **Ore**

c. Prospecting

d. Mining

e. **Smelting**

i. **Alloy**

SECTION 2-1

REVIEW AND REINFORCE

Properties of Minerals

◆ Understanding Main Ideas

Fill in the blanks in the table below.

Mineral Property	Test
1.	Perform scratch test
Color	Observe surface of mineral
2.	Observe color of powder on unglazed tile
Luster	Observe how mineral reflects light
3.	Find mass per unit volume
4.	Observe number and angle of crystal faces
Cleavage and Fracture	Break mineral apart to see if it splits along flat surfaces

Answer the following questions on a separate sheet of paper.

- List the five characteristics necessary for a substance to be a mineral.
- Explain why each mineral has its own properties, different from every other mineral.

◆ Building Vocabulary

Match each term with its definition by writing the letter of the correct definition on the line beside the term.

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- _____ 7. cleavage
- _____ 8. streak
- _____ 9. luster
- _____ 10. compound
- _____ 11. fluorescence
- _____ 12. fracture
- _____ 13. Mohs hardness scale
- _____ 14. crystal
- _____ 15. element

- a. the property of glowing under ultraviolet light
- b. how a mineral reflects light from its surface
- c. a substance composed of a single kind of atom
- d. the property of splitting evenly along flat surfaces
- e. two or more elements chemically joined
- f. how a mineral breaks apart when it does not split evenly
- g. the repeating pattern of a mineral's particles in a solid
- h. the color of a mineral's powder
- i. a ranking of minerals from softest to hardest

SECTION 2-2

REVIEW AND REINFORCE

How Minerals Form

◆ Understanding Main Ideas

Fill in the blanks to complete the flowchart below.

1. _____ heats water underground. → 2. _____
dissolve in the hot water to form solutions. → These solutions follow cracks
within the rock. → Elements and compounds leave the solutions during
cooling and 3. _____ as minerals. → The minerals form a
narrow channel or slab in the rock called a(n) 4. _____.

Answer the following questions on a separate sheet of paper.

5. In general, what are the two ways in which minerals form?
6. Describe conditions in which large and small crystals are likely to form.
7. How do minerals form around chimneys on the ocean floor?
8. Describe how halite deposits form.

◆ Building Vocabulary

Fill in the blank to complete each statement.

9. A(n) _____ is a mixture in which one substance dissolves in another.
10. _____ is molten material from Earth's mantle that hardens to form rock.

SECTION 2-3 REVIEW AND REINFORCE

Mineral Resources

◆ Understanding Main Ideas

Fill in the blanks to complete the table below.

Mineral(s)	Use(s)
1.	tools, machinery, light-bulb filaments, steel girders
2.	jewelry, decoration, mechanical parts, abrasives
3.	glass, electronic equipment
4.	wallboard, cement, stucco

Answer the following questions in the spaces provided.

5. What are the three types of mines?

6. Describe the smelting of iron ore.

7. Why are alloys useful? Describe an example.

◆ Building Vocabulary

Fill in the blank to complete each statement.

8. A(n) _____ is a solid mixture of two or more metals.

9. A(n) _____ is a rock that contains a metal or economically useful mineral.

10. A process in which an ore is melted to separate the useful metal from other elements the ore contains is called _____.

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Name: _____

Class: Earth Science
Ch. 2 Review

Choose the letter of the correct answer.

- To restore land damaged by strip mining, mine operators
[A] leave the damaged land for nature to restore.
[B] build houses where they mined.
[C] fill the exposed areas with water.
[D] grade the surface and replace the soil.
- What type of crystal structure does halite have?
[A] monoclinic [B] hexagonal [C] cubic [D] glassy
- The color of a mineral's powder is called its
[A] streak. [B] density. [C] hardness. [D] luster.
- Steelmakers add other elements to iron to make
[A] softer alloys. [B] weaker alloys.
[C] alloys with special properties. [D] more brittle alloys.
- Which type of mine often has a network of tunnels that extend deep into the ground, following the veins of ore?
[A] shaft mine [B] vein mine [C] open pit mine [D] strip mine
- The repeating pattern of a mineral's particles forms a solid called a(n)
[A] compound. [B] element. [C] crystal. [D] rock.
- What do metal tools and machinery, the metal filament in a light bulb, and steel girders used to frame an office building all have in common?
[A] They are gems. [B] They are rare.
[C] They are magnetic. [D] They began as minerals inside Earth's crust.
- Magma that cools very slowly deep beneath the surface forms minerals with what type of crystals?
[A] small [B] large [C] cubic [D] very hard

Choose the letter of the correct answer.

9. A rare, colorful mineral with a brilliant luster and a hardness of 8 or 9 on the Mohs hardness scale would probably be used as a(n)
[A] ore. [B] gemstone. [C] alloy. [D] pure metal.

Fill in the word or phrase that best completes the statement(s).

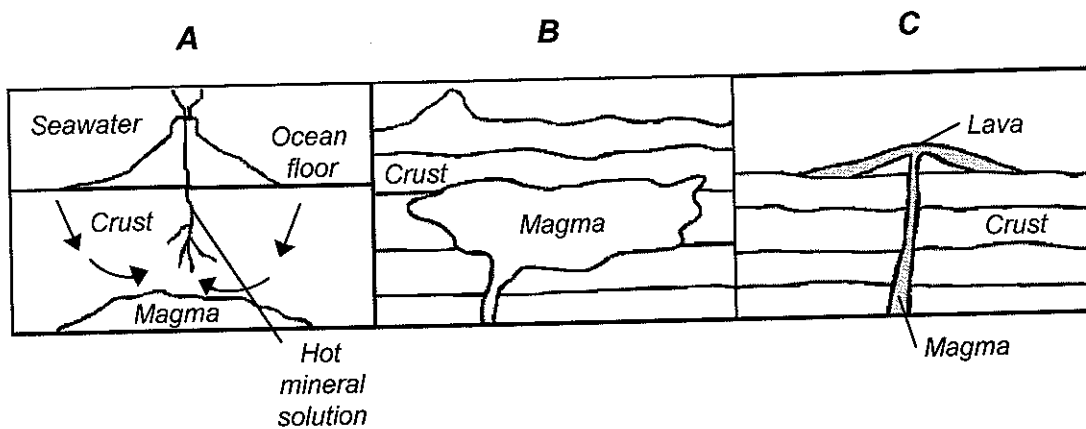
10. You can roughly compare the _____ of two mineral samples of the same size by hefting them.
11. Miners remove ore deposits that occur in veins by digging _____ mines.
12. Lava at Earth's surface or _____ below Earth's surface cools and hardens to form mineral crystals.
13. Geologists look for certain features on Earth's surface when they search, or _____, for ore deposits.
14. One way to identify a mineral is to rub it against a piece of unglazed tile to observe its _____.
15. Rocks that contain a useful mineral that can be mined at a profit are called _____.
16. When the elements that form a mineral dissolve in hot water, they form a mixture called a(n) _____.
17. The use of earthmoving equipment to dig a huge pit is called _____ mining.
18. Shiny minerals, such as galena, are said to have metallic _____.

If the statement is true, write true. If it is false, change the underlined word or words to make the statement true.

19. The process of prospecting involves mixing an ore with other substances and heating the mixture to a very high temperature.

Use the diagram to answer the question(s).

How Minerals Form



20. Describe how minerals form in Diagram B.
21. How would you expect the size of the mineral crystals in Diagrams B and C to compare?
22. What feature is shown in Diagram A and where might it occur?

Use the table to answer the question(s).

Mohs Hardness Scale

Mineral	Hardness
Talc	1
Gypsum	2
Calcite	3
Fluorite	4
Apatite	5
Feldspar	6
Quartz	7
Topaz	8
Corundum	9
Diamond	10

23. List the following minerals in order of decreasing hardness: apatite, calcite, corundum, feldspar, and talc.
24. Which minerals in the table will scratch quartz?
25. What would happen if you rubbed a piece of fluorite against a piece of feldspar?

Write an answer to the following question(s).

26. What are three properties for which gemstones are valued and two ways they are used in industry?
27. Describe the two types of chemical composition that characterize minerals.
28. A vein of silver is believed to occur 0.7 kilometers below the surface. It extends downward at an angle to an unknown depth. Which type of mine would be best for getting the silver? Explain your answer.
29. Describe the process of smelting.
30. What does a mineral's streak tell you and how do you test for it?

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