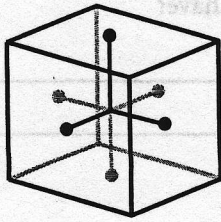
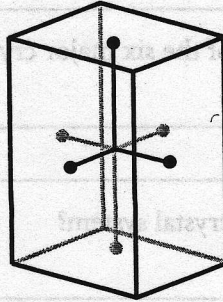


Crystal Systems

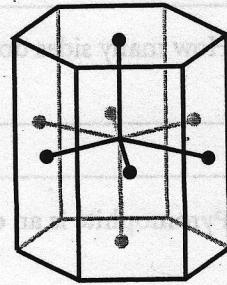
Crystal Systems



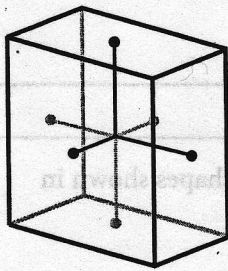
Cubic



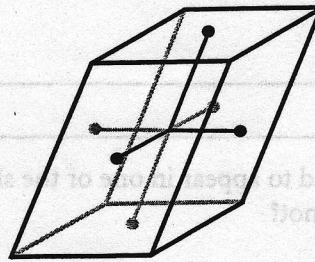
Tetragonal



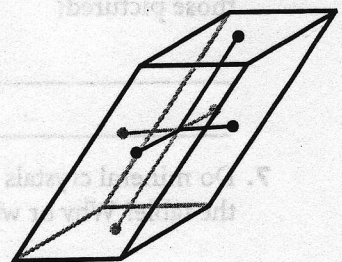
Hexagonal



Orthorhombic



Monoclinic



Triclinic

Copyright © Glencoe/McGraw-Hill, a division of The McGraw-Hill Companies, Inc.

Crystal Systems

1. What is a crystal?

2. How many sides do crystals of each of the six major crystal systems have?

3. Pyromophite is an example of what crystal system?

4. How would you use crystal structure to tell a crystal of pyrite from a crystal of gypsum?

5. Name a mineral in the triclinic crystal system.

6. Under what conditions can minerals grow to form well-defined crystal shapes like those pictured?

7. Do mineral crystals tend to appear in one of the six well-defined shapes shown in the table? Why or why not?

8. How are atoms arranged in crystalline structures?

Mohs Hardness Scale

Mohs Hardness Scale

Hardness		Hardness of Common Objects
Talc	1 (softest)	
Gypsum	2	finger nail (2.5)
Calcite	3	piece of copper (3.5)
Fluorite	4	iron nail (4.5)
Apatite	5	glass (5.5)
Feldspar	6	steel file (6.5)
Quartz	7	streak plate (7)
Topaz	8	scratches quartz
Corundum	9	scratches topaz
Diamond	10 (hardest)	scratches all common materials

Use with Chapter 4
Section 4.2

Mohs Hardness Scale

1. What does the property of mineral hardness measure?

2. What is the softest mineral shown, and what is its hardness on the Mohs scale?

3. What is the hardest mineral shown, and what is its hardness on the Mohs scale?

4. Explain how you could estimate the hardness of a mineral that does not appear on the Mohs scale.

5. Which common object will scratch feldspar?

6. Which minerals on the Mohs scale will scratch apatite? Which will apatite scratch?

7. What is the hardness of a mineral that scratches gypsum but cannot scratch calcite? Explain your answer.

SECTION 4.1 *What is a Mineral?*

In your textbook, read about mineral identification.

Use each of the terms below just once to complete the passage.

cleavage

color

fracture

hardness

luster

specific gravity

streak

texture

Geologists use physical properties to identify minerals. For example, the **(16)** _____ of a mineral is caused by the presence of different trace elements. The way a mineral reflects light from its surface is called **(17)** _____, which is described as metallic or nonmetallic. How a mineral feels to the touch is called **(18)** _____. A mineral's **(19)** _____ is the color of a mineral when it is broken up and powdered. A measure of how easily a mineral can be scratched is called **(20)** _____.

Another property describes how a mineral will break. If a mineral splits easily and evenly along one or more planes, it has the property of **(21)** _____, while minerals that break along jagged edges are said to have **(22)** _____. The density of a mineral is usually expressed as **(23)** _____, which is the ratio of the weight of a substance to the weight of an equal volume of water at 4°C.

In your textbook, read about mineral identification.

Answer the following questions.

24. Can all minerals produce a streak on a porcelain plate? Why or why not?

25. Can minerals with cleavage have more than one cleavage plane? If so, give an example.

26. What is the difference between density and specific gravity?

27. How many minerals are represented on the Mohs scale of mineral hardness?
What is the range of hardness of those minerals?

Minerals

SECTION 4.1 *What is a mineral?*

In your textbook, read about mineral characteristics.

Answer the following questions.

1. What is a mineral?

2. Why is salt classified as a mineral, but sugar is not?

3. Can minerals occur as liquids? Why or why not?

4. Can the chemical composition of a single mineral vary? Explain your answer.

5. What is a crystal?

6. How does forming in a restricted space affect the structure of a crystal?

7. What does the definite crystalline structure of a mineral consist of?

8. Why are feldspars considered to be minerals even though their compositions can vary?

SECTION 4.1 *What Is a mineral?, continued*

In your textbook, read about minerals that formed from magma and that formed from solution. For each statement, write true or false.

- _____ 9. Minerals can form from the cooling of magma.
- _____ 10. Density differences can force magma upward into cooler layers of Earth's interior.
- _____ 11. If magma cools slowly, atoms do not have time to arrange themselves into large crystals.
- _____ 12. Small crystals form from rapidly cooling magma.
- _____ 13. When liquid evaporates from a solution, the remaining elements cannot form crystals.
- _____ 14. Minerals can form from elements dissolved in a solution.
- _____ 15. If a solution remains unsaturated, mineral crystals may precipitate.

SECTION 4.2 *Types of Minerals*

In your textbook, read about mineral uses.

Answer the following questions.

1. What makes a mineral an ore?

2. Is aluminum an ore? Explain your answer.

3. Can the classification of a mineral as an ore change? If so, how?

4. How are ores deep beneath Earth's surface removed?

5. How are ores near Earth's surface removed?

6. What two problems can result from removing waste material from ores?

In your textbook, read about mineral groups.

Complete the table by filling in the following terms: *silicates, carbonates, oxides*.

Mineral Group	Description
7. _____	Calcite, dolomite, and rhodochrosite are examples.
8. _____	Readily form silica tetrahedrons
9. _____	Composed of one or more metallic elements with the carbonate compound CO_3
10. _____	Composed of silicon, oxygen, and another element
11. _____	Compounds of oxygen and a metal
12. _____	Magnetite and hematite, both sources of iron, are examples.
13. _____	The most common minerals, feldspar and quartz, are examples.
14. _____	Primary minerals in limestone and marble

SECTION 4.2 *Types of Minerals, continued*

In your textbook, read about mineral uses.

Use each of the terms below to complete the statements.

open-pit mines ore underground mining overlourden

15. A(n) _____ is a mineral that contains a useful substance that can be mined at a profit.
16. An ore located deep within Earth's crust is removed by _____.
17. An ore near Earth's surface is obtained from large _____.
18. Unwanted rock and dirt, known as _____, are dug up along with valuable ore.

In your textbook, read about gems.

Use each of the terms below to complete the statements.

abrasive emeralds gem trace elements

19. A(n) _____ is a valuable mineral prized for its rarity and beauty.
20. Because of their relative rareness, rubies and _____ are more valuable than diamonds.
21. The presence of _____ can make one variety of a mineral more colorful and thus more prized than other varieties of the same mineral.
22. The mineral corundum, which is often used as a(n) _____, can also be found as rubies and sapphires.