

CHAPTER

15

DIRECTED READING WORKSHEET

Rocks: Mineral Mixtures

As you read Chapter 15, which begins on page 392 of your textbook, answer the following questions.

It's What's Inside That Counts (p. 392)

1. Why do you think that rocks may seem unexciting on the outside?

2. How can the minerals inside a rock be seen clearly?

Pre-Reading Questions (p. 392)

Answer these questions in your ScienceLog now. Then later, you'll have a chance to revise your answers based on what you've learned.

Start-Up Activity (p. 393)

3. In this activity, materials are classified as _____
or as _____.

Section 1: From Minerals to Rocks (p. 394)

4. Which of the following are characteristics of a mineral?
(Circle all that apply.)
- a. It can be made in a laboratory.
 - b. It is nonliving material.
 - c. It is a liquid or a gas.
 - d. It has a repeating inner structure.
5. Minerals can be formed by plants or animals. True or False?
(Circle one.)



Chapter 15 Directed Reading, continued

Minerals: From the Inside Out (p. 394)

- 6. Which of the following is NOT a characteristic of crystals?
 - a. The arrangement of the atoms in a crystal creates its shape.
 - b. The arrangement of the atoms in a crystal depends on the elements that make up the mineral.
 - c. Atoms in a crystal are arranged in a repeating pattern.
 - d. Crystals are not solid substances.

Types of Minerals (p. 395)

- 7. Minerals are most often classified by _____ composition.
- 8. Silicate minerals must contain both _____ and _____.
- 9. Silicate minerals make up more than _____ percent of the Earth's crust.
- 10. The chemical and physical properties of nonsilicate minerals make them useless to humans. True or False? (Circle one.)

Look at Figure 3 on page 395 of your textbook. Choose the type of nonsilicate mineral in Column B that best matches the clue in Column A, and write the corresponding letter in the space provided. You may use items in Column B more than once.

Column A	Column B
___ 11. used to make toothpaste	a. carbonates
___ 12. used to make abrasives	b. halides
___ 13. used to make fireworks	c. oxides
___ 14. used to make aircraft parts	d. sulfates
___ 15. used to make fertilizer	
___ 16. used to make paint	

Identifying Minerals (p. 396)

- 17. By looking closely at a mineral, you can see all of its chemical properties. True or False? (Circle one.)
- 18. A mineral's use depends on its chemical and physical _____.
- 19. Amethyst is a type of quartz that gets its purple color from certain _____.

Chapter 15 Directed Reading, continued

20. Why isn't color a good way to identify a mineral?

21. The way the surface of a mineral reflects light is called _____.

22. Suppose you find a mineral on the way to school. You notice that it looks greasy and oily in light. How would you classify it using the luster chart in Figure 5 on page 396?

23. The mark that a mineral leaves when it is rubbed against a hard plate is called _____.

24. When a mineral's surface color is changed by weathering, its streak also changes. True or False? (Circle one.)

25. Gem cutters take advantage of a mineral's natural _____ to remove flaws from certain minerals, such as diamonds.

26. Cleavage and fracture both describe the way minerals break. How are cleavage and fracture different?

27. Figure 8 on page 397 shows a curved fracture pattern called

- a.** elliptical fracture.
- b.** circular fracture.
- c.** conchoidal fracture.
- d.** bending fracture.

28. A mineral's hardness can be determined by scratching its surface with materials that have a known hardness. True or False? (Circle one.)

29. Suppose you find a mineral that scratches calcite, is scratched by corundum, does not scratch topaz, and scratches quartz. What is this mineral's hardness on Mohs scale shown in Figure 9 on page 398?



Chapter 15 Directed Reading, continued

- 30. A golf ball feels heavier than a table-tennis ball because the golf ball has a _____ density.
- 31. Density is a ratio of an object's _____ to its _____.
- 32. Look at Figure 11 on page 399. Ultraviolet light is used to test a mineral for _____. A _____ is used to test a mineral for radioactivity.

Mid-Section Review (p. 399)

Now that you've finished the first part of Section 1, review what you learned by answering the Mid-Section Review questions in your ScienceLog.

Minerals Combine to Form Rock (p. 400)

- 33. Rocks are classified into three main categories by
 - a. what they look like.
 - b. what they are made of.
 - c. how they are broken down.
 - d. how they form.
- 34. Which of the following is NOT one of the main classifications of rock?
 - a. sedimentary
 - b. magma
 - c. igneous
 - d. metamorphic
- 35. What processes transform magma into igneous rock? (Circle all that apply.)
 - a. cooling
 - b. melting
 - c. hardening
 - d. squeezing
- 36. Sedimentary rock forms when existing rock is heated and squeezed. True or False? (Circle one.)
- 37. Each of the three main types of rock is further classified by _____ and _____.
- 38. Define the term *composition*.

Chapter 15 Directed Reading, continued

- 39.** Rock with very small or no visible crystals or mineral grains has a _____ texture. In contrast, rock with large crystals or mineral grains has a _____ texture.

The Rock Cycle (p. 401)

- 40.** Look at Figure 14 on page 401. The sediments that form sedimentary rock can come only from metamorphic rock. True or False? (Circle one.)
- 41.** Figure 14 shows that heat and pressure change igneous rock into _____ rock.
- 42.** Rock at Earth’s surface changes in the same ways as rock deep inside the Earth changes. True or False? (Circle one.)
- 43.** Water and wind can cause both weathering and erosion. What is the major difference between these two processes?

- 44.** The process by which soft sediment is squeezed until it hardens into rock is called _____ .
- 45.** Which of the following factors metamorphose rock deep below Earth’s surface? (Circle all that apply.)
- | | |
|------------------|-----------------------|
| a. uplift | c. cementation |
| b. heat | d. pressure |

Section Review (p. 402)

Now that you’ve finished Section 1, review what you learned by answering the Section Review questions in your ScienceLog.

Section 2: Igneous Rock (p. 403)

- 1.** Which of the following factors affect the type of igneous rock that forms when magma cools? (Circle all that apply.)
- a.** the composition of the magma
 - b.** the climate
 - c.** the amount of time it takes the magma to cool
 - d.** the weather



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It's What's Inside That Counts (p. 392)

1. Why do you think that rocks may seem unexciting on the outside?

Accept all reasonable answers. Sample answer: Rocks often look dull and dark because we see them everyday.

2. How can the minerals inside a rock be seen clearly?

The minerals can be seen by slicing the rock very thinly and viewing the slices under a microscope.

Pre-Reading Questions (p. 392)

Answer these questions in your ScienceLog now. Then later, you'll have a chance to revise your answers based on what you've learned.

Start-Up Activity (p. 393)

3. In this activity, materials are classified as minerals or as nonminerals.

Section 1: From Minerals to Rocks (p. 394)

4. Which of the following are characteristics of a mineral? (Circle all that apply.)

- a. It can be made in a laboratory.
- b. It is nonliving material.
- c. It is a liquid or a gas.
- d. It has a repeating inner structure.

5. Minerals can be formed by plants or animals. True or False? (Circle one.)

Chapter 15 Directed Reading, continued

Minerals: From the Inside Out (p. 394)

6. Which of the following is NOT a characteristic of crystals?
- a. The arrangement of the atoms in a crystal creates its shape.
 - b. The arrangement of the atoms in a crystal depends on the elements that make up the mineral.
 - c. Atoms in a crystal are arranged in a repeating pattern.
 - d.** Crystals are not solid substances.

Types of Minerals (p. 395)

7. Minerals are most often classified by _____ **chemical** _____ composition.
8. Silicate minerals must contain both _____ **silicon** _____ and _____ **oxygen** _____.
9. Silicate minerals make up more than _____ **90** _____ percent of the Earth's crust.
10. The chemical and physical properties of nonsilicate minerals make them useless to humans. True or **False?** (Circle one.)

Look at Figure 3 on page 395 of your textbook. Choose the type of nonsilicate mineral in Column B that best matches the clue in Column A, and write the corresponding letter in the space provided. You may use items in Column B more than once.

Column A	Column B
<u> d </u> 11. used to make toothpaste	a. carbonates
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Identifying Minerals (p. 396)

17. By looking closely at a mineral, you can see all of its chemical properties. True or **False?** (Circle one.)
18. A mineral's use depends on its chemical and physical _____ **properties** _____.
19. Amethyst is a type of quartz that gets its purple color from certain _____ **impurities** _____.

Chapter 15 Directed Reading, continued

20. Why isn't color a good way to identify a mineral?

Color isn't a good way to identify a mineral because air and water and small amounts of impurities can change the color of a mineral.

21. The way the surface of a mineral reflects light is called luster.

22. Suppose you find a mineral on the way to school. You notice that it looks greasy and oily in light. How would you classify it using the luster chart in Figure 5 on page 396?

I would classify the mineral as having a waxy, nonmetallic luster.

23. The mark that a mineral leaves when it is rubbed against a hard plate is called streak.

24. When a mineral's surface color is changed by weathering, its streak also changes. True or False? (Circle one.)

25. Gem cutters take advantage of a mineral's natural cleavage to remove flaws from certain minerals, such as diamonds.

26. Cleavage and fracture both describe the way minerals break. How are cleavage and fracture different?

Cleavage is the tendency of some minerals to break along flat surfaces.
Fracture is the tendency of some minerals to break along curved or irregular surfaces.

27. Figure 8 on page 397 shows a curved fracture pattern called

- a. elliptical fracture.
- b. circular fracture.
- c. conchoidal fracture.
- d. bending fracture.

28. A mineral's hardness can be determined by scratching its surface with materials that have a known hardness. True or False? (Circle one.)

29. Suppose you find a mineral that scratches calcite, is scratched by corundum, does not scratch topaz, and scratches quartz. What is this mineral's hardness on Mohs scale shown in Figure 9 on page 398?

This mineral has about the same hardness as topaz: 8 on Mohs scale.

Chapter 15 Directed Reading, continued

30. A golf ball feels heavier than a table-tennis ball because the golf ball has a greater density.
31. Density is a ratio of an object's mass to its volume.
32. Look at Figure 11 on page 399. Ultraviolet light is used to test a mineral for fluorescence. A Geiger counter is used to test a mineral for radioactivity.

Mid-Section Review (p. 399)

Now that you've finished the first part of Section 1, review what you learned by answering the Mid-Section Review questions in your ScienceLog.

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 - d. metamorphic
35. What processes transform magma into igneous rock? (Circle all that apply.)
- a. cooling
 - b. melting
 - c. hardening
 - d. squeezing
36. Sedimentary rock forms when existing rock is heated and squeezed. True or False? (Circle one.)
37. Each of the three main types of rock is further classified by composition and texture.
38. Define the term *composition*.
- A rock's composition is its chemical makeup, or the combination of minerals it is made of.
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