

Directed Reading A

Section: Metamorphic Rock

- _____ 1. Which rock's name comes from the Greek words for "changed" and "shape"?
- a. metamorphic
 - b. sedimentary
 - c. fossiliferous limestone
 - d. igneous
- _____ 2. What kind of rocks are rocks in which the structure, texture, or composition have been changed?
- a. fossiliferous limestone
 - b. igneous
 - c. metamorphic
 - d. sedimentary
- _____ 3. What force or forces can create metamorphic rocks?
- a. cooling
 - b. heat and pressure
 - c. melting
 - d. erosion

ORIGINS OF METAMORPHIC ROCK

4. The heat and pressure at which some metamorphic rocks originally form allow them to sometimes remain _____ at pressures and temperatures that would melt other rock.
5. Pressure caused by large movements within the crust sometimes cause the _____ in metamorphic rocks to align themselves in parallel bands.
6. During _____, rock is heated by nearby magma.
7. The effect of heat on rock decreases as the rock's _____ from the magma increases and its _____ decreases.
8. When pressure builds up in rock which is located under other rock formations, _____ occurs.
9. Regional metamorphism occurs deep in the Earth's _____.

Directed Reading A *continued*

COMPOSITION OF METAMORPHIC ROCK

- _____ 10. Which of the following is NOT a property of an index mineral?
- a. forms only at a certain temperature
 - b. forms only in sedimentary rock
 - c. forms only at certain temperatures
 - d. forms only in metamorphic rocks
- _____ 11. Which of the following minerals is an example of an index mineral?
- a. calcite
 - b. quartz
 - c. staurolite
 - d. hematite
- _____ 12. Which of the following is an example of a mineral that indicates that a metamorphic rock was formed at a great depth and under extreme heat and pressure?
- a. chlorite
 - b. mica
 - c. magma
 - d. garnet

TEXTURES OF METAMORPHIC ROCK

- _____ 13. What do we call metamorphic rocks in which mineral grains are NOT aligned?
- a. foliated
 - b. intrusive
 - c. nonfoliated
 - d. extrusive
- _____ 14. What is the process in which a mineral changes composition during metamorphism called?
- a. recrystallization
 - b. nonfoliation
 - c. foliation
 - d. deformation
- _____ 15. After quartz limestone has recrystallized, the new rock is called
- a. schist.
 - b. gneiss.
 - c. slate.
 - d. quartzite.

Directed Reading A *continued*

Match the correct description with the correct term. Write the letter in the space provided.

- | | |
|----------------------------------------------------------------------------------------------------------------|--------------------|
| _____ 16. a rock in which coarse-grained minerals separate into distinct bands | a. foliated |
| _____ 17. a foliated metamorphic rock made from shale | b. shale |
| _____ 18. the texture of a metamorphic rock in which the mineral grains are arranged in planes or bands | c. slate |
| _____ 19. a metamorphic rock made from phyllite that has been exposed to heat and pressure | d. phyllite |
| _____ 20. a sedimentary rock made of layers of clay | e. schist |
| _____ 21. a metamorphic rock made from slate that has been subjected to heat and pressure | f. gneiss |

METAMORPHIC ROCK STRUCTURES

- _____ **22.** What is a change in the shape of a rock caused by a force placed on it called?
- a.** deformation
 - b.** recrystallization
 - c.** foliation
 - d.** nonfoliation

Skills Worksheet

Section Review

Metamorphic Rock

USING KEY TERMS

1. In your own words, define the following terms: *foliated* and *nonfoliated*.

UNDERSTANDING KEY IDEAS

- _____ 2. Which of the following is not a type of foliated metamorphic rock?

- a. gneiss
- b. slate
- c. marble
- d. schist

3. Explain the difference between contact metamorphism and regional metamorphism.

4. Explain how index minerals allow a scientist to understand the history of a metamorphic rock.

Section Review *continued*

MATH SKILLS

5. For every 3.3 km a rock is buried, the pressure placed upon it increases 0.1 gigapascal (100 million pascals). If rock undergoing metamorphosis is buried at 16 km, what is the pressure placed on that rock? (Hint: The pressure of Earth's surface is .101 gigapascal.) Show your work below.

CRITICAL THINKING

6. **Making Inferences** If you had two metamorphic rocks, one that has garnet crystals and the other that has chlorite crystals, which one could have formed at a deeper level in the Earth's crust? Explain your answer.

7. **Applying Concepts** Which do you think would be easier to break, a foliated rock, such as slate, or a nonfoliated rock, such as quartzite? Explain.

8. **Analyzing Processes** A mountain range is located at a boundary where two tectonic plates are colliding. Would most of the metamorphic rock in the mountain range be a product of contact metamorphism or regional metamorphism? Explain.
