

Sedimentary and Metamorphic Rocks

SECTION 6.1 Formation of Sedimentary Rocks

In your textbook, read about the processes that form sedimentary rocks. Use each of the terms below to complete the following statements.

COLUMN A (1-3)

- A) chemical weathering
- B) sediment
- C) unsorted deposits

COLUMN B (4-6)

- A) cementation
- B) sedimentary rock
- C) clastic sediment

COLUMN C (7-10)

- A) sorted deposits
- B) lithification
- C) physical weathering
- D) deposition

1. _____ consists of solid material that has been deposited on Earth's surface by wind, water, ice, gravity, or chemical precipitation.
2. Glaciers and landslides tend to create _____ in which sediments of different sizes are mixed together.
3. During _____, the minerals in a rock are dissolved or otherwise chemically changed.
4. The process by which mineral growth binds sediment grains together into solid rock is _____.
5. Weathering produces _____, which are rock and mineral fragments.
6. When sediments become cemented together, they form _____.
7. As a result of _____, sediments are laid down on the ground or on the bottom of bodies of water.
8. The physical and chemical process called _____ transforms sediments into sedimentary rocks.
9. During _____, minerals remain chemically unchanged, and rock fragments simply break off of the solid rock along fractures or grain boundaries.
10. Sediments tend to form _____ when transported by water and wind.

col A

col B

col C

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SECTION 6.1 Formation of Sedimentary Rocks, continued

In your textbook, read about lithification.

For each statement below, write *true* or *false*. TRUE = A FALSE = B

- A B 11. Lithification begins with erosion.
- A B 12. Muds may contain up to 60 percent water and shrink as excess water is squeezed out.
- A B 13. Sands are usually poorly compacted during deposition, and they tend to compact a great deal during burial.
- A B 14. Groundwater, oil, and natural gas are commonly found within pore spaces in sedimentary rocks.
- A B 15. The temperature in Earth's crust decreases with depth.
- A B 16. Physical weathering changes the composition of mineral fragments.
- A B 17. In one type of cementation, a new mineral grows between sediment grains.
- A B 18. Mud compacts more than sand.

In your textbook, read about the features of sedimentary rocks.
Use each of the terms below to complete the passage.

- | | | | |
|-------------------|------------|--------------------|-------------------|
| (A) cross-bedding | fossils | (B) graded bedding | (C) lithification |
| (D) ripple marks | sand dunes | transport | (E) bedding |

The primary feature of sedimentary rocks is (19) _____, or horizontal layering.
 The type of bedding that occurs depends upon the sediment's method of Transport _____.
 Bedding is called 20 _____ when the heaviest and coarsest material is on the bottom. A second type of bedding called 21. _____ forms as inclined layers of sediment migrate forward across a horizontal surface. Large-scale cross-bedding can be formed by migrating Sand dunes _____. When sediment is moved into small ridges by wind or wave action, 22 _____ can form. Many sedimentary rocks contain Fossils _____, the preserved remains, impressions, or any other evidence of once-living organisms. During 23 _____, parts of an organism can be replaced by minerals and turned into rock.

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SECTION 6.2 Types of Sedimentary Rocks

In your textbook, read about the about different types of sedimentary rocks.

Complete the table by filling in the type of sedimentary rock. A= detrital B= biochemical C= chemical

	Description	Type of Sedimentary Rock
24)	3. Breccias and conglomerates are examples.	
25)	2. Classified by particle size	
26)	3. Coal is an example.	
27)	4. Formed from the remains of once-living things	
28)	5. Formed from deposits of loose sediments	
29)	6. Often contains calcite, halite, or gypsum	
30)	7. Forms evaporites	
31)	8. Sandstone is a medium-grained example.	
32)	9. Formed from precipitation and growth of mineral crystals	
33)	10. Formed from the shells of sea organisms	

In your textbook, read about how sedimentary rocks form and their importance to humans.
Answer the following questions.

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How does fossil-containing limestone form?

Some have smooth textures that are formed by interlocking grains of calcite

shells from the dead sea animals settle to the bottom during burial and lithification. The Calcium carbon is precipitated out of the water.

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What information can fossils provide?

Fossils are the remains or other evidence of once-living organisms that are preserved in sedimentary rocks

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What do some of the features of sedimentary rocks indicate about ancient bodies of water?

horizontal, cross-bedding, and ripple marks that would still be there. Location, life, wave direction, shorelines.

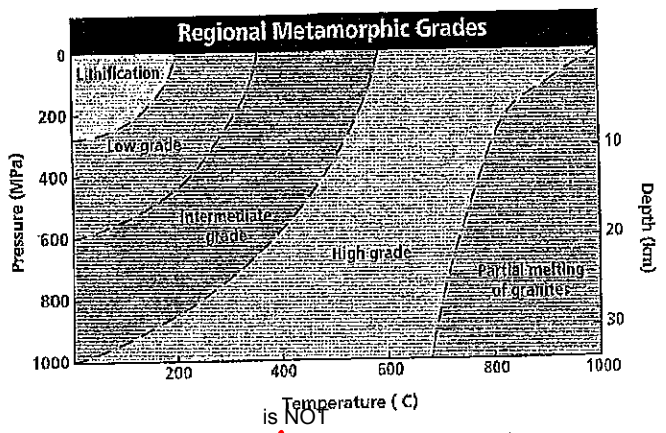
CHAPTER 6 **STUDY GUIDE**

SECTION 6.3 Metamorphic Rocks

In your textbook, read about metamorphic rocks.
 For each item in Column A, write the letter of the matching item in Column B.

- | Column A | Column B |
|---|---------------------------------|
| _____ 34. Occurs when rocks come into contact with molten rock | a. contact metamorphism |
| _____ 35. Rock whose texture, mineralogy, or chemical composition has been altered without melting it | b. foliated metamorphic rock |
| _____ 36. Metamorphism resulting from high temperature and pressure that affects a large region | c. nonfoliated metamorphic rock |
| porphyroblasts _____ | d. metamorphic rock |
| hydrothermal metamorphism _____ | hydrothermal metamorphism |
| _____ 37. Characterized by wavy layers and bands of light and dark minerals | porphyroblasts |
| _____ 38. Composed mainly of minerals with blocky crystal shapes | e. regional metamorphism |

In your textbook, read about types of metamorphism.
 Use the diagram to answer the following questions.



39. What grades of regional metamorphism are shown on the graph?
 A) Pressure B) Temperature C) Depth D) Texture
40. Which grades represent the highest pressure conditions?
 A) Low B) Intermediate C) High D) BOTH Low & High E) BOTH Intermediate & High
41. Which grade generally occurs between 0 and 20 km below Earth's surface?
 A) Lithification B) Low Grade C) Intermediate Grade D) High Grade E) partial melting of Granites

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SECTION 6.3 Metamorphic Rocks, continued

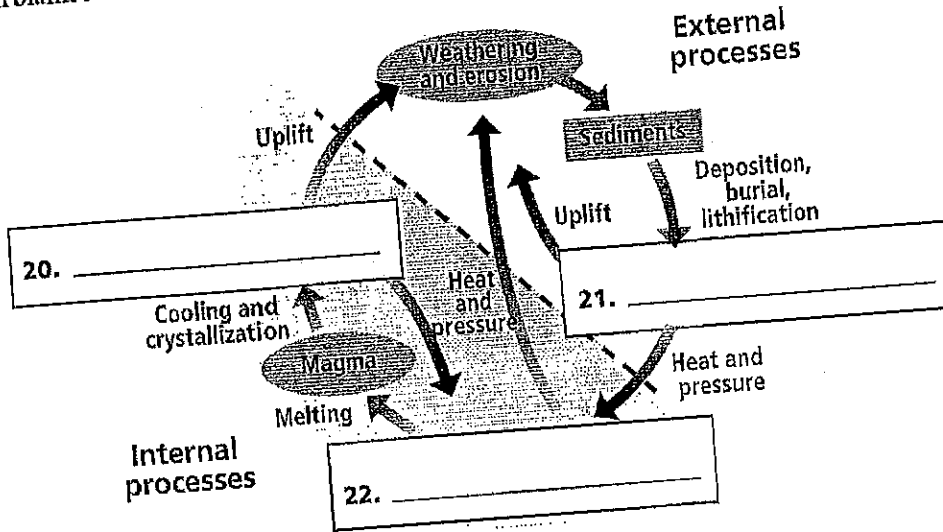
In your textbook, read about causes and types of metamorphism.
Circle the letter of the choice that best completes the statement.

42. The pressure required for metamorphism can be generated by
 a. pressure from weight of overlying rock.
 b. heat from magma bodies in contact with surrounding rock.
 c. cementation and lithification.
 d. hydrothermal solutions.
43. A regional metamorphic belt is divided into zones based upon
 a. the number of volcanoes in the area.
 b. mineral groups found in the rocks.
 c. types of fossils found in the rocks.
 d. current underground temperatures.
44. Contact metamorphism occurs under conditions of
 a. high temperature and high pressure.
 b. high temperature and moderate-to-low pressure.
 c. low temperature and very high pressure.
 d. low temperature and moderate-to-low pressure.
45. Minerals that crystallize at higher temperatures as a result of contact metamorphism tend to be found near
 a. coal deposits.
 b. bodies of water.
 c. coral reefs.
 d. igneous intrusions.
46. The type of metamorphism that occurs when very hot water reacts with and alters the mineralogy of rock is
 a. contact.
 b. regional.
 c. hydrothermal.
 d. local.
47. Metamorphic rocks in which the long axes of their minerals are perpendicular to the pressure that altered them are described as
 a. marble-like.
 b. quartzite-like.
 c. foliated.
 d. nonfoliated.
48. Metamorphic rocks that lack mineral grains with long axes oriented in one direction are described as
 a. marble-like.
 b. quartzite-like.
 c. foliated.
 d. nonfoliated.
49. Porphyroblasts differ from the minerals surrounding them in terms of
 a. size.
 b. color.
 c. axis of orientation.
 d. shape.
50. Hot fluids migrating into and out of a rock during metamorphism can change the rock's
 a. chemistry.
 b. energy.
 c. grade.
 d. fossil content.

CHAPTER 6

SECTION 6.3 Metamorphic Rocks, continued

In your textbook, read about the rock cycle. Label each blank below as igneous rocks, sedimentary rocks, or metamorphic rocks.



Answer the following questions.

23. How are igneous rocks formed?

24. What happens to igneous rocks that undergo weathering and erosion?

25. How do sediments become sedimentary rock?

26. What forces cause sedimentary rocks to be transformed into metamorphic rocks?

27. How can metamorphic rock be transformed into igneous rock?

28. How can sandstone be transformed into sediment without becoming metamorphic or igneous rock first?

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