

**Rocks** • Guided Reading and Study

## Sedimentary Rocks

This section describes how sedimentary rocks form and how they are classified and used.

### Use Target Reading Skills

As you read about sedimentary rocks, use the headings to complete the outline below.

Sedimentary Rocks	
I. From Sediment to Rocks	
A. Erosion	
B.	<u>Deposition</u>
C.	<u>Compaction</u>
D. Cementation	
II. Types of Sedimentary Rock	
A.	<u>Clastic Rocks</u>
B. Organic Rocks	
C.	<u>Chemical Rocks</u>
D.	<u>_____</u>
III.	<u>Use of Sedimentary Rocks</u>

### From Sediment to Rock

1. What remains of living things may sediment include? shells, bones, leaves, and stems
2. Small, solid pieces of material that come from rocks or living things are called sediment.
3. Is the following sentence true or false? Sedimentary rocks form from particles deposited by water and wind. true

### Sedimentary Rocks (continued)

4. List three forces that can carry sediment.

- a. running water
- b. wind
- c. ice

Match the process with its description.

Process	Description
<u>c</u> 5. erosion	a. Dissolved minerals glue sediments together.
<u>d</u> 6. deposition	b. Sediments are pressed together in layers.
<u>b</u> 7. compaction	c. Water or wind loosen and carry away fragments of rock.
<u>a</u> 8. cementation	d. Sediments settle out of water or wind.

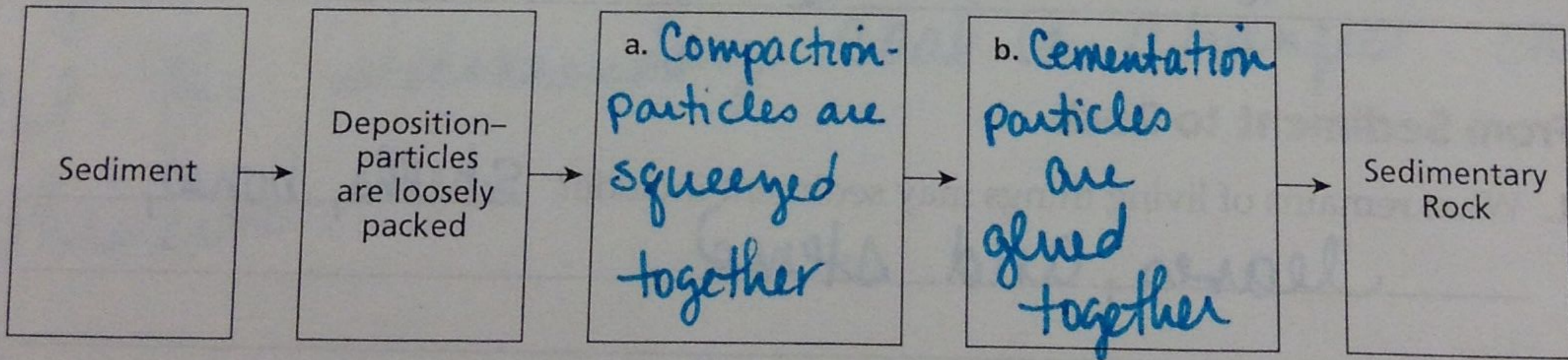
9. What happens to rock fragments and other materials carried by water?

They sink to the bottom of a lake or ocean

10. The process in which thick layers of sediment press down on the layers beneath them is called Compaction.

11. Complete the flowchart to show how sediment is turned into sedimentary rock and what happens to it at each step.

Sedimentary Rock Formation



c. Describe what happens to sediment as it is changed to sedimentary rock.

The particles in the sediment are being exposed to greater pressure at each step

12. Is the following sentence true or false? It takes millions of years for sedimentary rock to form. true

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**Types of Sedimentary Rock**

13. How do geologists classify sedimentary rock? according to the type of sediments that make up the rock
14. List the three major groups of sedimentary rock.
- clastic
  - organic
  - chemical
15. Is the following sentence true or false? The same process forms all types of sedimentary rock. false
16. Is the following sentence true or false? Clastic rocks form when rock fragments are squeezed together. true
17. How are clastic rocks classified? They are grouped by the size of the rock fragments, or particles of which they are made.
18. Complete the table to show the different materials from which clastic rock forms.

How Clastic Rock Forms	
Type of Clastic Rock	Material From Which It Forms
a. <u>Shale</u>	Tiny particles of clay
b. <u>Sandstone</u>	Small particles of sand
c. <u>Conglomerate</u>	Different-sized rock fragments

- d. How are the types of clastic rocks shown in the table similar and different? Similar - formed from other rocks  
Different - particles of rock that make them are diff. sizes
19. The type of rocks that form where the remains of plants and animals are deposited in thick layers is called organic rock.

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**Sedimentary Rocks** (continued)

20. List two important organic rocks.
- a. coal
  - b. limestone
21. Organic rock that forms from the remains of swamp plants buried in water is coal.
22. How does organic limestone form? Coral, clams, oysters, and other living things in the ocean that have hard shells or skeletons made of calcite die. Their shells pile up on the ocean floor in layers. Over millions of years, compaction and cementation change the sediment to limestone.
23. Circle the letter of each sentence that describes a way that chemical rocks can form.
- a. Minerals that are dissolved in a solution crystallize.
  - b. Sediments of plants and animals form oil and other chemicals in rock.
  - c. Mineral deposits form when seas or lakes evaporate.
  - d. Tiny particles of clay are cemented together with chemicals.
24. Is the following sentence true or false? Some limestone is considered to be a chemical rock. true
25. Rock salt crystallizes from the mineral halite.

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Uses of Sedimentary Rocks

26. Why have sandstone and limestone been used as building materials for thousands of years? Both types of stone are soft enough to be cut easily into blocks or slabs.
27. Is the following sentence true or false? The White House in Washington, D.C., is built of limestone. false
28. What are some ways that builders today use sandstone and limestone? for decorating or for covering the outside walls of buildings
29. Is the following sentence true or false? Limestone is used for making cement. true

Rocks • Review and Reinforce

# Sedimentary Rocks

## Understanding Main Ideas

The flowchart below shows a sequence of processes that form sedimentary rock. Put the processes into the correct sequence by writing their letters in the correct order in the blank.

- a. Compaction ⇒ b. Erosion ⇒ c. Cementation ⇒ d. Deposition

1. b, d, a, c

Classify each of the following sedimentary rocks by writing *Clastic*, *Organic*, or *Chemical* in the blank beside it.

- |                 |   |                 |              |
|-----------------|---|-----------------|--------------|
| <u>Clastic</u>  | 2. Sandstone                                | <u>Organic</u>  | 6. Coal      |
| <u>Organic</u>  | 3. Limestone made from shells               | <u>Clastic</u>  | 7. Breccia   |
| <u>Clastic</u>  | 4. Conglomerate                             | <u>Chemical</u> | 8. Rock salt |
| <u>Chemical</u> | 5. Limestone made from precipitated calcite | <u>Clastic</u>  | 9. Shale     |

## Building Vocabulary

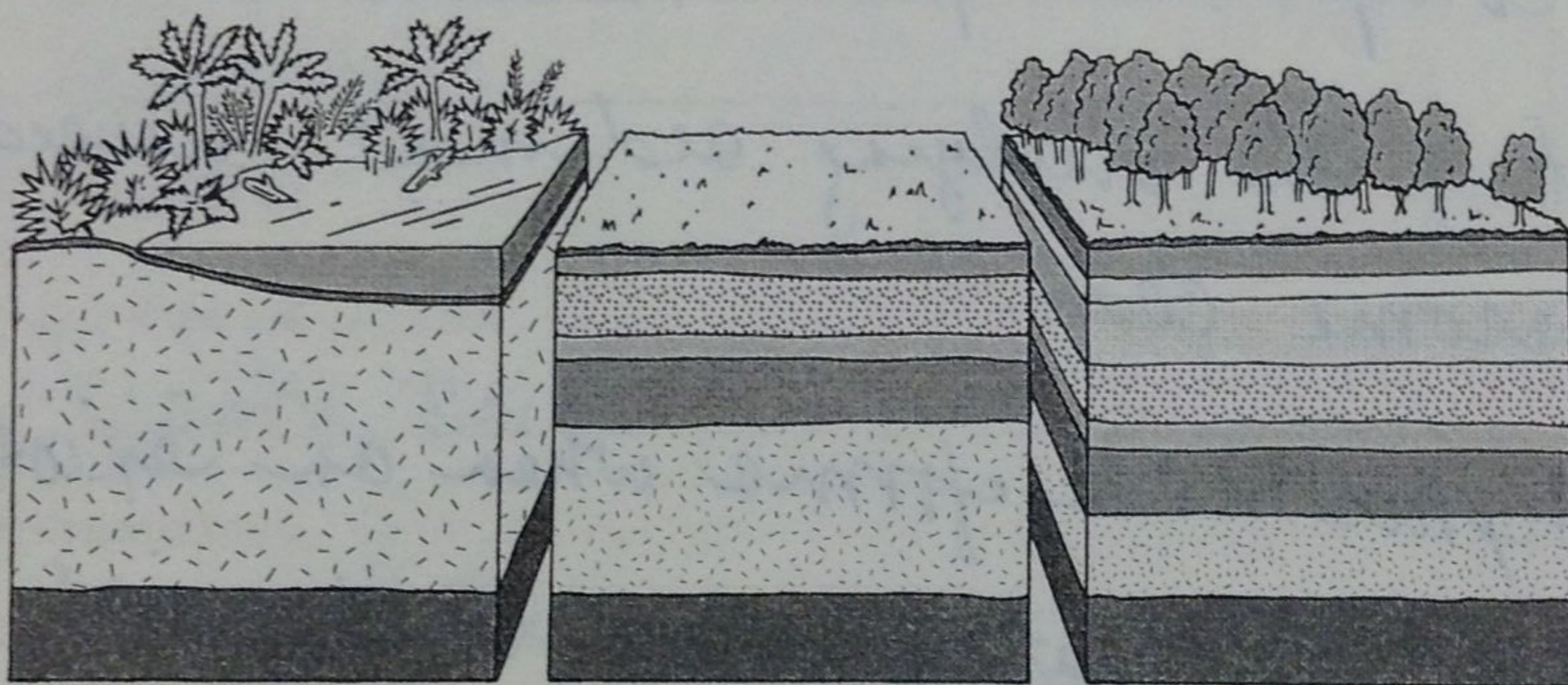
Match each term with its definition by writing the letter of the correct definition on the line beside the term.

- |                            |  |
|----------------------------|--|
| <u>d</u> 10. erosion       | a. small, solid pieces of material from rocks or living things                           |
| <u>f</u> 11. clastic rock  | b. the process that presses sediments together   |
| <u>a</u> 12. sediment      | c. sedimentary rock that forms from remains of plants and animals                        |
| <u>e</u> 13. cementation   | d. the process in which running water, wind, or ice loosen and carry away rock fragments |
| <u>c</u> 14. organic rock  | e. the process in which dissolved minerals crystallize and glue sediments together       |
| <u>b</u> 15. compaction    | f. sedimentary rock that forms when rock fragments are squeezed together                 |
| <u>h</u> 16. chemical rock | g. the process by which sediment settles out of wind or water                            |
| <u>g</u> 17. deposition    | h. sedimentary rock that forms when minerals dissolved in a solution crystallize         |

## The Formation of Coal

Coal is an organic sedimentary rock. One of its properties is that it burns. Coal provides energy for industries and for the production of electricity.

Much of the country's best coal is found in Pennsylvania, Ohio, West Virginia, Kentucky, Tennessee, and Alabama. The formation of this large coalfield began about 300 million years ago during a time geologists call the Carboniferous Period. During that period, vast tropical swamp forests covered much of North America. When these ancient trees died, they fell into the swamp water, which was low in oxygen. Instead of rotting—as they would in an oxygen-rich environment—the dead vegetation piled up. The sequence of pictures below tells the rest of the story of how this plant matter became coal.



Dead plant matter built up on the bottom of a vast swamp during the Carboniferous Period.

Layers of sediment were deposited. The weight of the sediment compacted the plant matter into a substance called peat.

More and more sediment was deposited on top of the peat. Over millions of years, the weight of overlying sediment compressed the peat into coal.

Answer the following questions on a separate sheet of paper.

1. What is coal?
2. When did the coal deposits of the eastern United States begin to form? What were environmental conditions like at that time?
3. What is peat?
4. What process caused the peat to become coal?
5. A type of coal called anthracite is classified by geologists as a metamorphic rock. It is much harder than sedimentary coal. Describe how you think anthracite forms.

1. Coal is an organic sedimentary rock that forms from the remains of swamp plants buried in water.
2. They began to form about 300 million years ago, during the Carboniferous Period. During that period, vast tropical swamp forests covered much of North America.
3. Peat is compacted plant matter.
4. The weight of the overlying sediment caused peat to become coal.
5. Metamorphic rock forms when an existing rock is changed by heat, pressure, or chemical reactions. Therefore, heat and pressure probably increase until the sedimentary coal is changed into anthracite.