

BEFORE YOU READ

After you read this section, you should be able to answer these questions:

- How do sedimentary rocks form?
- How do geologists classify sedimentary rocks?
- What are some sedimentary structures?

National Science Education Standards

ES 1c, 1d

How Does Sedimentary Rock Form?

Remember that wind, water, ice, and gravity can cause rock to break down into fragments. These fragments are called *sediment*. During erosion, sediment is moved across the Earth’s surface. Then the sediment is deposited in layers on the Earth’s surface. As new layers are deposited, they cover older layers. The weight of the new layers *compacts*, or squeezes, the sediment in the older layers.

Water within the sediment layers can contain dissolved minerals, such as calcite and quartz. As the sediment is compacted, these minerals can crystallize between the sediment pieces. The minerals act as a natural glue and hold the sediment pieces together. As the loose sediment grains become bound together, a kind of sedimentary rock forms.

Unlike igneous and metamorphic rocks, sedimentary rock does not form at high temperatures and pressures. Sedimentary rock forms at or near the Earth’s surface. ✓

Sediment is deposited in layers. Therefore, most sedimentary rocks contain layers called **strata** (singular, *stratum*).



These “monuments” in Monument Valley, Arizona, formed as sedimentary rock eroded over millions of years.

STUDY TIP

Reading Organizer As you read this section, create an outline of this section using the headings from this section.

Say It

Infer and Discuss In what kinds of areas are you likely to find sediment? Write down four places that sediment can be found. Think about the size of the sediment pieces that may be found at each place. Then, discuss your ideas with a small group.

READING CHECK

1. Describe Where does sedimentary rock form?

SECTION 3 Sedimentary Rock *continued*

How Do Geologists Classify Sedimentary Rock?

Like other kinds of rock, sedimentary rock is classified by how it forms. Some sedimentary rock forms when rock or mineral fragments are stuck together. Some forms when minerals crystallize out of water. Other sedimentary rock forms from the remains of plants and animals.

CLASTIC SEDIMENTARY ROCK

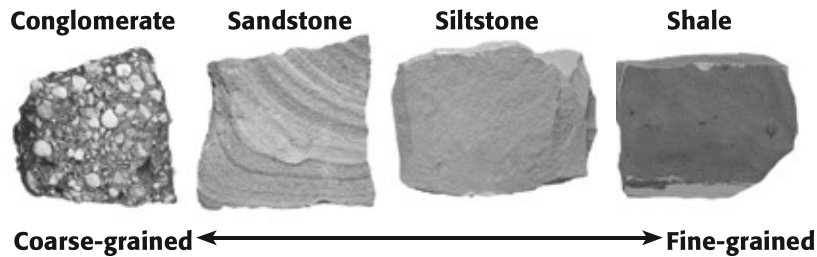
Most sedimentary rock is clastic sedimentary rock. *Clastic sedimentary rock* forms when fragments of other rocks are cemented together. In most cases, the cement is a mineral such as calcite or quartz. The sediment pieces in different rocks can be of different sizes. Geologists group clastic sedimentary rocks by the sizes of the sediment pieces in them. ✓

READING CHECK

2. Identify Give two minerals that can act as cement in sedimentary rocks.

TAKE A LOOK

3. Describe What is the texture of conglomerate?



Coarse-grained sedimentary rocks, such as conglomerate, contain large sediment pieces. Fine-grained rocks, such as shale, are made of tiny sediment pieces.

CHEMICAL SEDIMENTARY ROCK

Chemical sedimentary rock forms when minerals crystallize out of water. Water moves over rocks on the Earth's surface. As the water moves, it dissolves some of the minerals in the rocks. When the water evaporates, the dissolved minerals can crystallize to form chemical sedimentary rocks. ✓

Many chemical sedimentary rocks contain only one or two kinds of mineral. For example, evaporite is a chemical sedimentary rock. Evaporite is made mainly of the minerals halite and gypsum. These minerals crystallize when water evaporates.

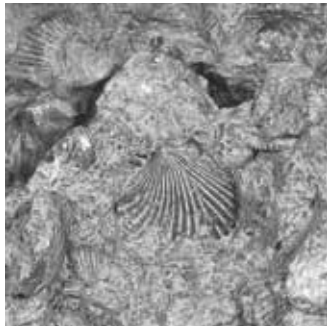
READING CHECK

4. Explain How do chemical sedimentary rocks form?

SECTION 3 Sedimentary Rock *continued***ORGANIC SEDIMENTARY ROCK**

Organic sedimentary rock forms from the remains of plants and animals. Coal is one type of organic sedimentary rock. Coal forms from plant material that has been buried deep underground. Over millions of years, the buried plant material turns into coal.

Some organic sedimentary rock forms from the remains of sea creatures. For example, some limestone is made from the skeletons of creatures called *coral*. Coral are tiny creatures that make hard skeletons out of calcium carbonate. These skeletons and the shells of other sea creatures can be glued together to form *fossiliferous limestone*.



The shells of sea creatures can be cemented together to form fossiliferous limestone.

TAKE A LOOK

5. Define What is fossiliferous limestone?

What Are Some Features of Sedimentary Rock?

The features of sedimentary rocks can give you clues about how the rocks formed. For example, many clastic sedimentary rocks show **stratification**. This means that they contain strata. Clastic sedimentary rocks show stratification because sediment is deposited in layers. ✓

Some sedimentary rock features show the motions of wind and water. For example, some sedimentary rocks show ripple marks or mud cracks. *Ripple marks* are parallel lines that show how wind or water has moved sediment. *Mud cracks* form when fine-grained sediment dries out and cracks.



These ripple marks show how sediment was moved by flowing water.

READING CHECK

6. Explain Why do many clastic sedimentary rocks show stratification?

Section 3 Review

NSES ES 1c, 1d

SECTION VOCABULARY

strata layers of rock (singular, <i>stratum</i>)	stratification the process in which sedimentary rocks are arranged in layers
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1. **Define** Write your own definition for stratification.

2. **List** Give three examples of clastic sedimentary rocks.

3. **Compare** How are clastic and organic sedimentary rocks different?

4. **Describe** How does evaporite form?

5. **Describe** How does fossiliferous limestone form?

6. **Infer** Imagine that a geologist finds a sedimentary rock with ripple marks in it. What can the geologist guess about the environment in which the sediment was deposited? Explain your answer.
