

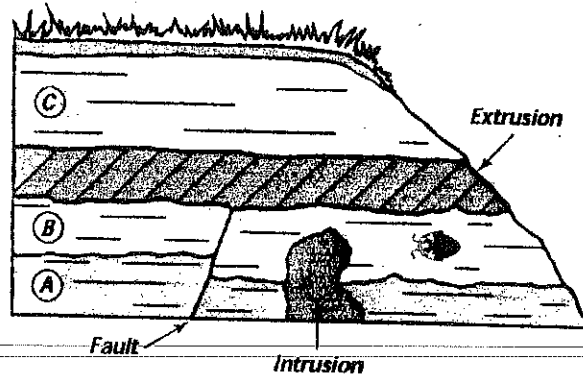
SECTION 4-2

REVIEW AND REINFORCE

Finding the Relative Age of Rocks

◆ Understanding Main Ideas

Use the figure below to answer questions 1–4. Write your answers on a separate sheet of paper.



1. What is the youngest rock layer on the figure? Explain.
2. Is the extrusion older or younger than rock layer B? Explain.
3. Is the fault older or younger than rock layer A? Explain.
4. How could a geologist use the fossil in rock layer B to date a rock layer in another location?

◆ Building Vocabulary

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

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|-------------------------------|--|
| _____ 5. fault | a. the number of years since a rock formed |
| _____ 6. extrusion | b. a break or crack along which rocks move |
| _____ 7. unconformity | c. the way to determine relative ages of rocks |
| _____ 8. relative age | d. a hardened layer of magma |
| _____ 9. law of superposition | e. the age of a rock compared with the age of other rocks |
| _____ 10. intrusion | f. fossils used to determine the relative ages of rock layers |
| _____ 11. absolute age | g. a place where an eroded surface is in contact with a newer rock layer |
| _____ 12. index fossil | h. a hardened layer of lava |

SECTION 4-2**SECTION SUMMARY****Finding the Relative Age of Rocks****Guide for Reading**

- ◆ How do geologists determine the relative age of rocks?
- ◆ How are index fossils useful to geologists?

The sediment that forms sedimentary rocks is deposited in flat layers. Over years, the sediment becomes deeply buried, hardens, and changes into sedimentary rock. At the same time, remains of organisms in the sediment may become fossils. These rock layers provide a record of Earth's geologic history.

The **relative age** of a rock is its age compared to the ages of other rocks. The **absolute age** of a rock is the number of years since the rock formed. It can be difficult to determine the absolute age of a rock. Geologists use the **law of superposition** to determine the relative ages of sedimentary rock layers. **According to the law of superposition, in horizontal sedimentary rock layers the oldest is at the bottom. Each higher layer is younger than the layer below it.**

There are other clues to the relative ages of rocks. Geologists find some of these clues by studying extrusions and intrusions of igneous rock and faults. Igneous rock forms when magma or lava hardens. Lava that hardens on the surface is called an **extrusion**. The rock layers below an extrusion are always older than the extrusion. Beneath the surface, magma may push into bodies of rock. There, the magma cools and hardens into a mass of igneous rock called an **intrusion**. An intrusion is always younger than the rock layers around and beneath it.

More clues come from the study of faults. A **fault** is a break in Earth's crust. A fault is always younger than the rock it cuts through. The surface where new rock layers meet a much older rock surface beneath them is called an **unconformity**. An **unconformity** is a gap in the geologic record. An unconformity shows where some rock layers have been lost because of erosion.

To date rock layers, geologists first give a relative age to a layer of rock at one location and then give the same age to matching layers at other locations. Certain fossils, called **index fossils**, help geologists match rock layers. To be useful as an **index fossil**, a fossil must be widely distributed and represent a type of organism that existed only briefly. **Index fossils are useful because they tell the relative ages of the rock layers in which they occur.** Geologists use particular types of organisms, such as trilobites, as index fossils. Trilobites were a group of hard-shelled animals that evolved in shallow seas more than 500 million years ago. They later became extinct. Trilobite fossils have been found in many different places.