

# 21

# Chapter Review

## the BIG idea

**Rocks, fossils, and other types of natural evidence tell Earth's story.**



**CONTENT REVIEW**  
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### KEY CONCEPTS SUMMARY

#### 1 Earth's past is revealed in rocks and fossils.

**Fossils** are traces or remnants of past life. Many fossils are found in rock. Rocks, fossils, and other natural evidence provide information about how Earth and life on Earth have changed over time.

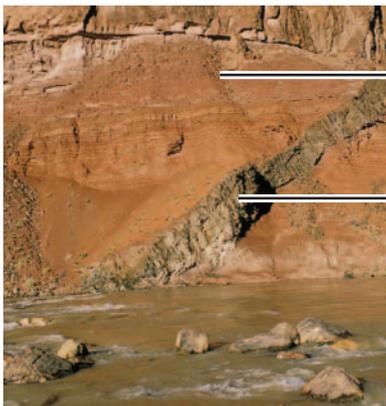
#### VOCABULARY

**fossil** p. 715  
**original remains** p. 716  
**ice core** p. 721



A cast fossil is formed when minerals take the shape of a decayed organism.

#### 2 Rocks provide a timeline for Earth.



Sedimentary rock layers show the order in which rocks formed. The order of the layers is used to determine the **relative ages** of fossils found in the rock.

Radioactive dating can be used to determine the **absolute age** of igneous rock.



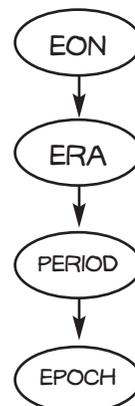
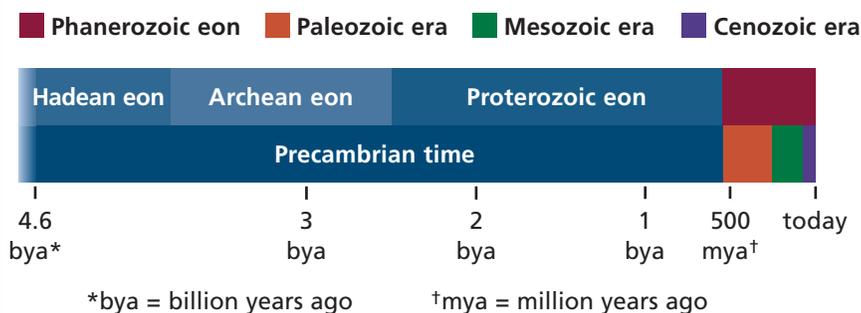
Scientists combine information about the relative and absolute ages of rocks and fossils to construct a timeline of Earth.

#### VOCABULARY

**relative age** p. 723  
**index fossil** p. 725  
**absolute age** p. 727  
**half-life** p. 727

#### 3 The geologic time scale shows Earth's past.

The **geologic time scale** divides Earth's history into eons, eras, periods, and epochs. The divisions are based on major changes or events that occurred in Earth's history.

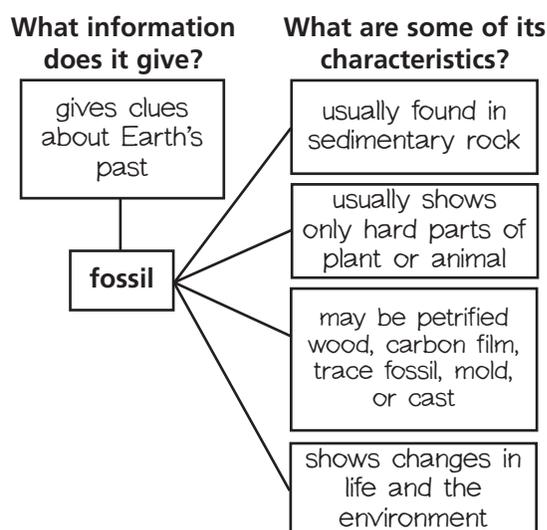


#### VOCABULARY

**uniformitarianism**  
p. 732  
**geologic time scale**  
p. 733

## Vocabulary

Make a concept definition map for each of the vocabulary terms listed below. Write the term in the center box. Fill in the other boxes by answering the questions. A sample is shown below.



1. index fossil
2. ice core
3. original remains

## Reviewing Key Concepts

**Multiple Choice** Choose the letter of the best answer.

4. Which of the following might show evidence of a year with low rainfall?  
a. tree rings                      c. original remains  
b. index fossils                  d. sedimentary rock
5. In which time span did dinosaurs live?  
a. Cenozoic era                  c. Paleozoic era  
b. Mesozoic era                  d. Precambrian time
6. Half-life is a measurement of  
a. fossil age  
b. radioactive breakdown  
c. cold climates  
d. relative age

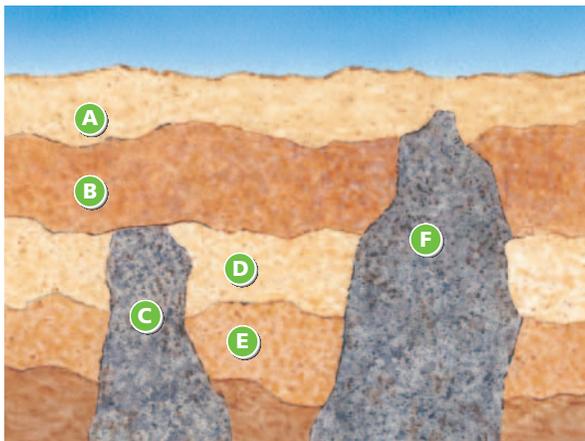
7. What is the age of Earth?  
a. 570 million years              c. 4.6 billion years  
b. 1.1 billion years              d. 9.5 billion years
8. What was the earliest form of life?  
a. a fish                              c. a one-celled organism  
b. a fern                              d. a reptile
9. Which statement best describes the theory of uniformitarianism?  
a. Earth continues to change as it always has.  
b. Earth is changing, but not as quickly as it used to.  
c. Earth is changing, but faster than it used to.  
d. Earth is no longer changing.
10. How does petrified wood form?  
a. A log falls into water that freezes.  
b. Sedimentary rock forms over a log.  
c. Igneous rock covers a log and heats it.  
d. Water seeps through a log, replacing its cells with minerals.
11. A cast fossil is formed from  
a. igneous rock                  c. amber  
b. a mold                              d. wood
12. Which of these substances best preserves soft parts of an organism?  
a. sedimentary rock              c. amber  
b. igneous rock                  d. air
13. Which part of an ancient reptile would you expect to see in a rock fossil?  
a. eye                                  c. heart  
b. bone                                d. muscle
14. Which type of fossil would be most likely to show the complete outline of a leaf?  
a. petrified wood                  c. cast fossil  
b. carbon film                      d. trace fossil

**Short Answer** Write a few sentences to answer each question.

15. Why are no fossils found in igneous rocks?
16. Why is radioactive dating not useful for determining the ages of sedimentary rocks?

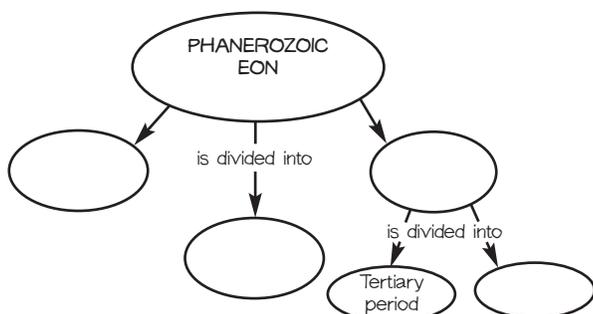
## Thinking Critically

**APPLY** Refer to the illustration below to answer the next four questions.

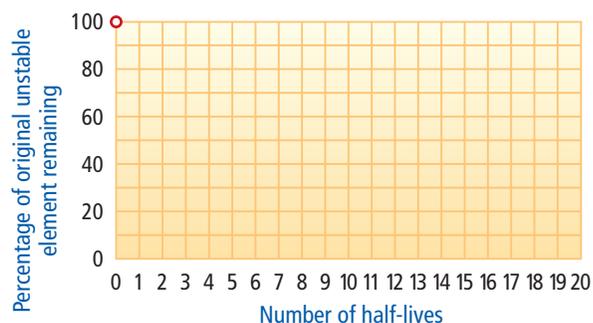


The illustration above is a side view of formations of sedimentary and igneous rock. C and F are igneous rock.

17. For which of the labeled rock formations could the absolute age be determined? Why?
  18. Which of the labeled rock formations is the youngest? How do you know?
  19. Which rock is younger, C or D? Why?
  20. Which of the labeled rock layers is the oldest? Why?
21. **INFER** Why do you think the Hadean, Archean, and Proterozoic eons are not divided into eras, periods, or epochs?
  22. **COMPARE AND CONTRAST** How is the geologic time scale like a calendar? How is it different?
  23. **CONNECT** Copy the concept map below. Use the geologic time scale on pages 734–735 to complete the map.



24. **APPLY AND GRAPH** Copy the graph below on your paper. Plot a point on the graph above each of the half-life numbers to show what percentage of the original unstable element remains. Note that the first point has been placed on the graph to show that all of the original element remains at the beginning, when no half-lives have passed.



## the BIG idea

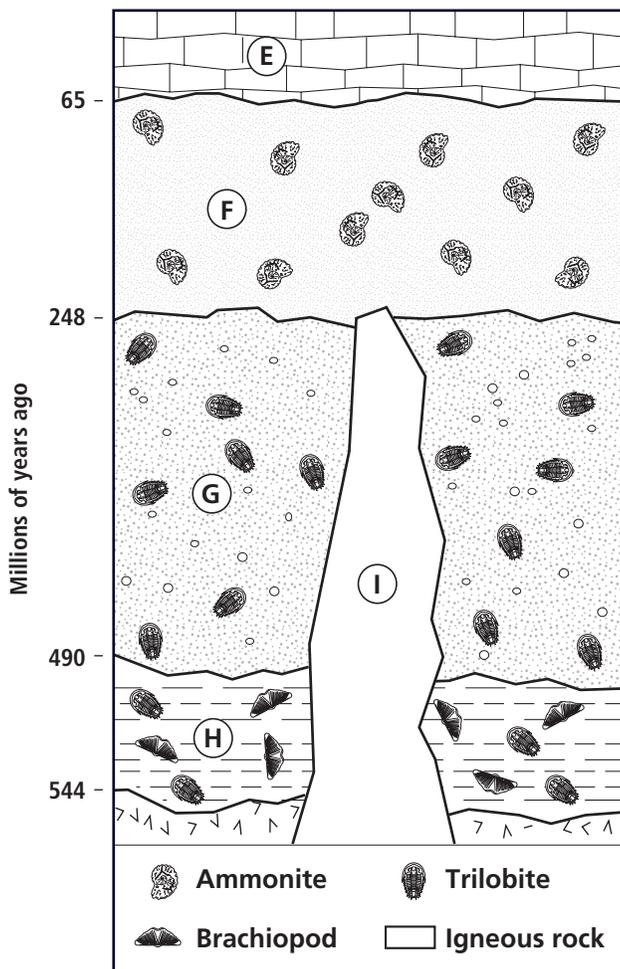
25. **SYNTHESIZE** Look at the geologic time scale and think about the major events in the history of Earth and the changes in life forms that it shows. How do rocks, fossils, and other natural evidence tell Earth's story?
26. **PREDICT** What do you think will remain as evidence of today's world 100,000 years from now? How will the types of evidence differ from those that remain from 100,000 years ago?

## UNIT PROJECTS

If you need to create graphs or other visuals for your project, be sure you have grid paper, poster board, markers, or other supplies.

## Analyzing a Diagram

This diagram shows a cross section of rock layers. All of the layers are sedimentary, except for the area marked as igneous. Use the diagram to answer the questions below.



- What is the approximate age of the oldest ammonite fossil shown in the diagram?
  - 65 million years
  - 248 million years
  - 480 million years
  - 540 million years
- When did trilobites live on Earth?
  - within the last 65 million years
  - between 65 million years ago and 248 million years ago
  - between 248 million years ago and 544 million years ago
  - more than 544 million years ago
- Which fossils are most common in the rock that is 500 million years old?
  - brachiopods
  - trilobites
  - ammonites
  - theropods
- What is the best estimate of the age of rock I?
  - less than 300 million years old
  - 300 million years old
  - more than 300 million years old
  - more than 544 million years old
- Which point shows where a fossil that is 500 million years old would most likely be found?
  - E
  - F
  - G
  - H

## Extended Response

Answer the two questions below in detail. Include some of the terms shown in the word box. In your answers, underline each term you use.

- Azeem is part of a team of scientists studying the natural history of a region. What types of natural evidence might he and his team look for? Why?

index fossils	original remains	igneous rock
layers	folded	bent
ice core	tree ring	trilobite

- In studying fossils found in her community, Yvette noticed a pattern in their ages. People found older fossils close to the surface and younger fossils at greater depths. Explain how that might be.