

1. 4.5 BILLION years
2. Relative Time Scale and the Atomic Time Scale
3. James Hutton
4. Petrology
5. Paleontology
6. Eras and periods
7. Iron, Stoney Iron and Stoney
8. False; they have only an approximate date.
9. Index Fossils
10. 50,000

The Physical Geography Series

Geologic Time

KG1157

TEACHER'S GUIDE

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Glossary

Relative Time Scale- A scale based on the layering in the rocks.

Atomic Time Scale- A scale based on the natural radioactivity of chemical elements in some rocks.

Eras- Broad spans of time based on the general character of life that existed during these times.

Periods- Shorter spans of time based partly on evidence of major disturbances of the earth's crust.

Index Fossils- Forms of life which existed during limited periods of geologic time and thus are used as guides to the age of the rocks in which they are preserved.

Carbon 14- An isotope of carbon which is used to date once living materials. Its half-life is 5,730 years.

Isotopes- Atoms of the same element which have differing atomic weights.

Half-Life - The time it takes for one half of the nuclei in a sample to decay.

Suggested Teaching Activities

1. Assemble a small collection of fossils and discuss where they once lived (ocean or lake environment, land environment, etc.) and how they were preserved.

2. Discuss the concept of time and how man has learned how to keep time (sundials, sand clocks, water clocks, spring clocks, atomic clocks).

3. Using a layer cake and frosting show how a layer cake is similar to Sedimentary rock deposits. Build the cake from the bottom. The bottom layer is the oldest and the top frosting layer is the youngest.

4. Visit a nearby university or college who might be doing radioactive dating and see if you can visit their lab facilities.

5. Discuss the differences between the "relative time scale" and the "atomic time scale." Point out to students that unlike tree-ring dating where each ring is a measure of one year's growth, no precise rate of deposition can be determined for most of the rock layers. Therefore the actual length of geologic time represented by any given layer is usually unknown or at best, a matter of opinion.

Quiz

1. According to geologists, how old is the earth?

2. What two scales do geologists use to measure time?

3. Who was the Scottish geologist who came up with the principle that the bottom-most layers of rocks were deposited first and therefore the oldest?

4. The study of rocks is called what?

5. The study of the evolution of life as seen by fossil evidence is called what?

6. Earth's history is divided into these broad spans of time.

7. Name three kinds of meteors.

8. Scientists know the EXACT age of the earth (True or false).

9. These are forms of life which existed during limited periods of geologic time and so are used as guides to the age of rocks in which they are preserved.

10. Radioactive Carbon dating only works for dating events that have taken place within the past _____ years.