Date

Class

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Evidence for Evolution

Scientists use fossils to better understand how organisms evolve. But how do scientists determine the age of a particular fossil? Read the passage below. Then use a separate sheet of paper to answer the questions that follow.

Dating the Fossil Record

Paleontologists, or scientists who study fossils, use two basic methods to identify the age of fossils: relative dating and radiometric dating.

Relative dating determines the age of a fossil by looking at its relative position in the layers of rock in the ground. This method is also known as stratigraphic dating. Stratigraphic refers to the order and relative position of the layers of rock. For example, a fossil is found in a certain layer of rock, so the layers below the fossil are older and layers above the fossil are younger. Index fossils are an important tool used in relative dating. These are commonly found fossils that have a known range in the geologic record. For instance, trilobites first appeared 570 to 500 million years ago and died out about 265 million years ago. Paleontologists can use the general age of trilobites to determine the age of other fossils found in the same rock layer.

Relative dating is not a precise measurement, however. Scientists can only say when it first appeared in the fossil record and compare this information to fossils found in earlier or later layers.

To be more precise, paleontologists use radiometric dating. In this method, scientists measure the amounts of naturally occurring radioactive isotopes (atoms that carry an electrical charge) found in rocks. This tells scientists how old the rock layer is, as well as the age of fossils in that rock layer.

Radiometric dating has drawbacks as well. Most radiometric dating can only be used on igneous rocks, not sedimentary rocks or actual fossils. Fossils are found in sedimentary rock. So paleontologists have to use radiometric dating information on igneous rocks found in layers below and above the fossils in order to determine an age range of the sedimentary rock.

- 1. How do scientists use relative dating to determine the age of a fossil?
- 2. What are index fossils?
- 3. Identify a drawback of using radiometric dating to determine the age of a fossil.