

# Dating Fossils

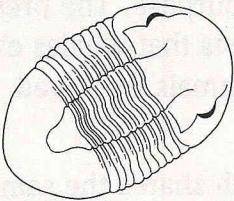
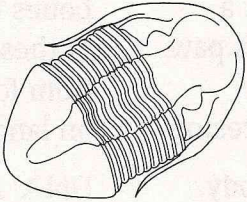
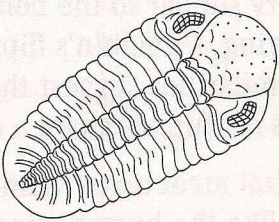
## How is the age of a fossil determined?

There are two ways to determine a fossil's age. When scientists use **relative dating**, they look to see where a fossil is relative to the other fossils around it. Because layers of sediments are deposited one on top of the other, the oldest layer is deposited first. Then younger layers are laid down one by one, with the layer closest to Earth's surface being the youngest. So, fossils found in lower rock layers are older than fossils found in upper rock layers. Relative dating orders the ages of fossils from oldest to youngest.

**Radiometric dating** uses radioactive isotopes to estimate the actual age of a fossil. **Isotopes** are atoms of the same element that have the same number of protons but different numbers of neutrons. **Radioactive isotopes** are atoms that are unstable,

meaning they decay, or break down, to form stable atoms of a different element. The rate at which radioactive isotopes decay is constant. Scientists know exactly how long it takes for a radioactive isotope to decay and form a new element. So, they can compare the amount of the isotope that remains in the fossil to the amount of the new element that has been formed to figure out how old the fossil is.

Some organisms lived over a wide area for a short time in geologic history. Fossils of these organisms serve as **index fossils** because scientists can use them to date other fossils. Any fossil that appears in the same rock layer as an index fossil can be assumed to be the same age as the index fossil.

<p><b>Illiaenus</b> 505-410 mya</p> 	<p><b>Isotelus</b> 500-400 mya</p> 	<p><b>Phacops</b> 430-345 mya</p> 
<p>mya = millions of years ago</p>		

Trilobites are valuable index fossils. Each species shown above lived on Earth during a specific time span.

### Show What You Know

Describe two ways in which relative dating and radiometric dating are different.

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