

Age of Earth

Early Indirect Estimates

In the 18th and 19th centuries, geologists (scientists who study Earth and its history) used indirect methods to estimate Earth's age.

- Geologists examined the amount of sediment a stream deposited in a year to calculate the duration for a stream to deposit an ancient sediment layer.
- British geologist Charles Lyle estimated that the first shelled animals appeared 240 million years ago

In 1892, William Thomson (later known as Lord Kelvin) calculated Earth to be 100 million years old by assuming that it began as a molten ball and cooled off to its current temperature.

In 1896, Thomson's calculation was confirmed to be invalid when radioactivity was discovered, meaning that heat was continuously produced from radioactive elements under Earth's surface.

Modern Quantitative Analysis

Understanding radioactivity has allowed scientists to date Earth materials such as rocks from Earth's crust and meteorites that are known to have formed at the same time as Earth. By considering the age of rocks and fossils, scientists created a timeline of geological history of 4.6 billion years.

Concept Check

- How did 18th century geologists estimate Earth's age?
- How do modern scientists evaluate Earth's age?

Study Tip

Make a timeline that shows the evolving method of how geologists estimated the age of the earth.



Evidence for an early Earth is found in rocks. By examining the radioactive elements within rocks, geologists are able to predict the age of the Earth. Diagrams such as these can be constructed from the evidence gathered.