

Name: _____
Period: _____

DATING FOSSILS

The diagram provided by the instructor shows a sandstone wall in Hadar, Africa. Fossils in the wall along with layers of volcanic ash have been exposed by erosion caused by a flowing river. Hadar sits in an area where the tectonic plates meet. The movement of these plates into one another created many active volcanoes during the time when hominids (any member of the human family Hominidae) were evolving.

Scientists are able to date layers of volcanic ash using potassium-argon dating. Once the age of the volcanic ash has been determined, you can infer the approximate age of the fossils between the ash layers.

Potassium-argon Dating:

The potassium-argon method is used only to date volcanic rocks and minerals. Volcanic materials contain potassium. It is a fact that about one part in 10,000 of naturally occurring potassium is radioactive and decays slowly but steadily to the stable isotopes argon (^{40}Ar) and calcium (^{40}Ca). The half-life of ^{40}K is 1,250 million years. By comparing the amounts of ^{40}K and ^{40}Ar an age for the volcanic material; can be calculated.

Potassium-argon ages can usually be used only to date the ages of volcanic layers between which fossils may lie. They will only provide boundary dates unless you are able to find a fossil embedded in the volcanic layer. It is somewhat common for hominid fossils to be found embedded in layers of volcanic ash.

Directions: Use the graph on the back of this page to find the answers to the questions below.

- Age of volcanic layer "A"(millions of years)_____
- Age of volcanic layer "B"(millions of years)_____
- Age of volcanic layer "C"(millions of years)_____
- Age of volcanic layer "D"(millions of years)_____

- Approximate age of fossil "A" (millions of years)_____
- Approximate age of fossil "B" (millions of years)_____
- Approximate age of fossil "C" (millions of years)_____
- Approximate age of fossil "D" (millions of years)_____
- Approximate age of fossil "E" (millions of years)_____