Absolute Dating: A Measure of Time

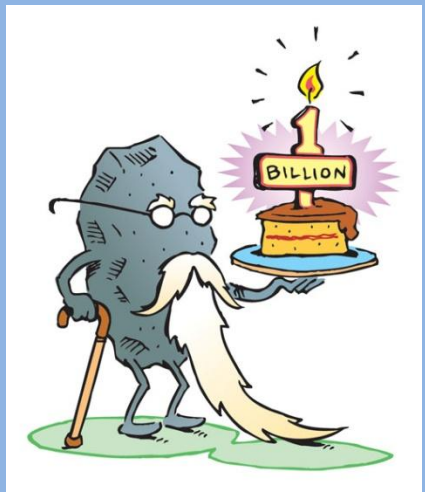
Objectives

- **Describe** how radioactive decay occurs.
- **Explain** how radioactive decay relates to radiometric dating.
- **Identify** four types of radiometric dating.
- **Determine** the best type of radiometric dating to use to date an object.

I. Radioactive Decay

A. **What Is Radioactive Decay?** Radioactive isotopes tend to break down into stable isotopes of the same or other elements in a process called radioactive decay.

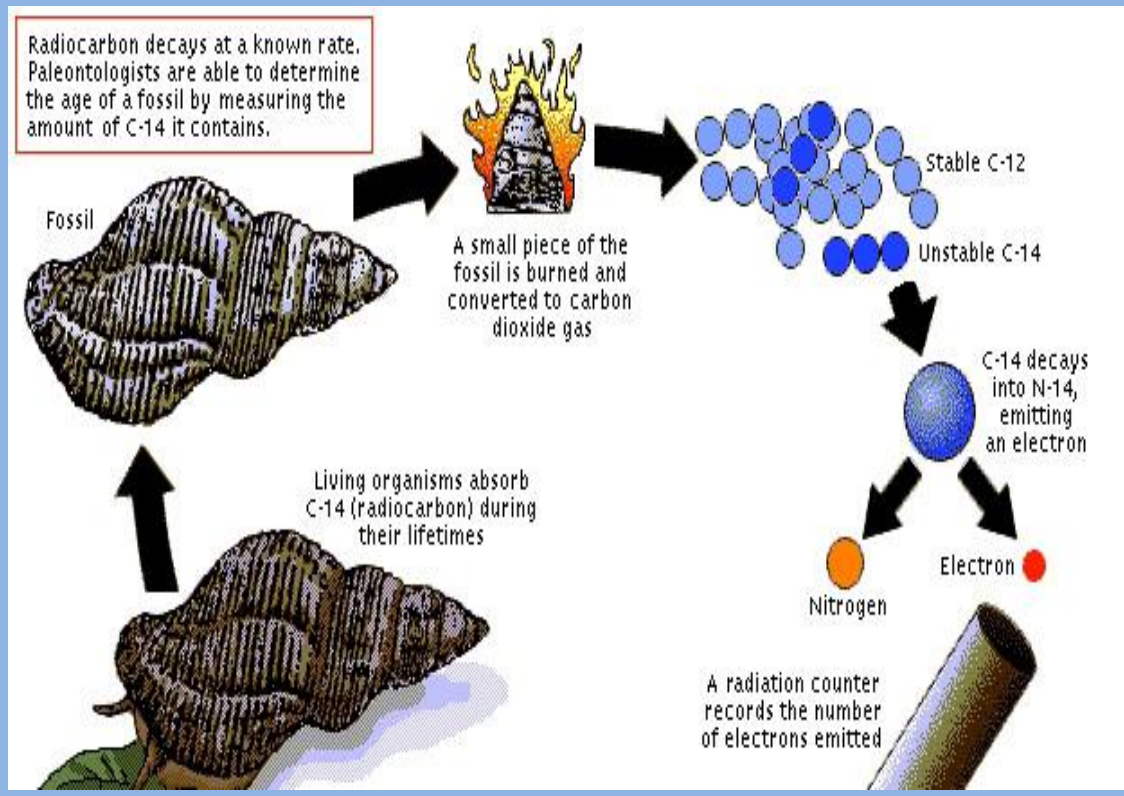
B. **Dating Rock—How Does It Work?** An unstable radioactive isotope is called the *parent isotop*e. The stable isotope produced by the radioactive decay of the parent isotope is called the *daughter isotope.* To date rock, scientists compare the amount of parent material with the amount of daughter material. The more daughter material there is, the older the rock is.



II. Radiometric Dating

A. **What Is Radiometric Dating?** Determining the absolute age of a sample, based on the ratio of parent material to daughter material, is called radiometric dating.

B. **Rate of Decay** If you know the rate of decay for a radioactive element in a rock, you can figure out the absolute age of the rock. A half-life is the time that it takes one-half of a radioactive sample to decay.



III. Types of Radiometric Dating

A. **Potassium-Argon Method** This method is used mainly to date rocks older than 100,000 years.

B. **Uranium-Lead Method** Uranium-lead dating can be used for rocks more than 10 million years old.

C. **Rubidium-Strontium Method** This method is also used to date rocks older than 10 million years.

D. **Carbon-14 Method T**his dating method is used mainly for dating things that lived within the last 50,000 years.

Grand Canyon's Three Sets of Rocks