

How Radiometric Dating Works

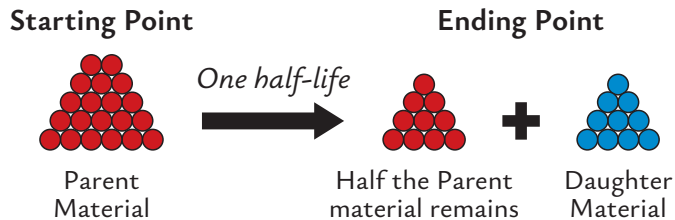
Radiometric dating is based on measurements of specific types of atoms in the rocks. Radioactive atoms, known as *parent* atoms, decay into *daughter* atoms of a different kind.

The amount of time for half the *parent* atoms to decay into *daughter* atoms is called the half-life. The age of the sample is calculated from the ratio of *parent* to *daughter* atoms.

Half-Life and Age

A Mathematical Rate of Decay

Measured by Half-life



The time in years depends on the kind of atom.

Calculating Age

Parent	Daughter	Age*
100	0	0
50	50	1
25	75	2
12.5	87.5	3
6.25	93.75	4

Sample half-lives (yrs)

$^{40}\text{K} - ^{40}\text{Ar}$	1.25 billion
$^{238}\text{U} - ^{206}\text{Pb}$	4.47 billion
$^{87}\text{Rb} - ^{87}\text{Sr}$	49.23 billion

*Age given in half-lives

After about 10 to 20 half-lives, not enough parent material remains to use.