



# Archaeology: 101

## *How old is it? Absolute Dating*

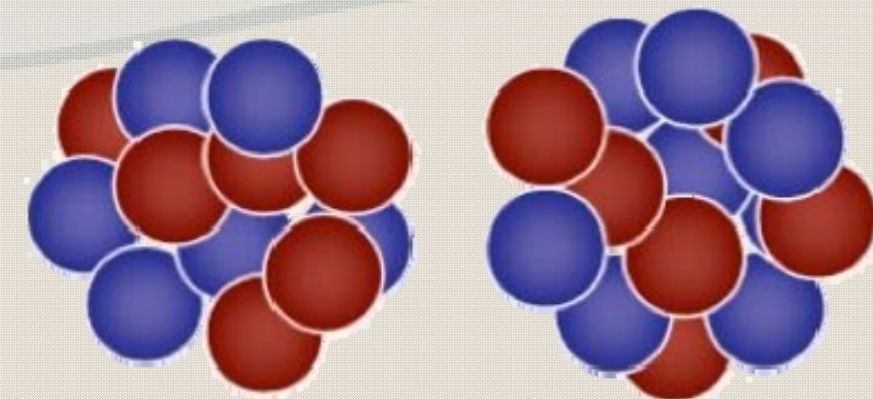
**Absolute dating** allows archaeologists to arrive at a definite date for an artifact. Let's say we find a coin at a site with the date 1886 stamped on it. Since we know the date of the coin absolutely, we can use **relative dating** to infer that the other artifacts at the site are from around the same time. Not all artifacts have dates stamped on them, however.

Another form of absolute dating is **carbon-14 dating**.

Carbon-14 dating is used to date organic artifacts (things that were once alive), such as bone and shell. The element carbon is absorbed by all living things during their lifetime.

A regular carbon has an atomic weight of 12: 6 protons and 6 neutrons.

Carbon-14 is an isotope of carbon and has two extra neutrons, giving it an atomic weight of 14.



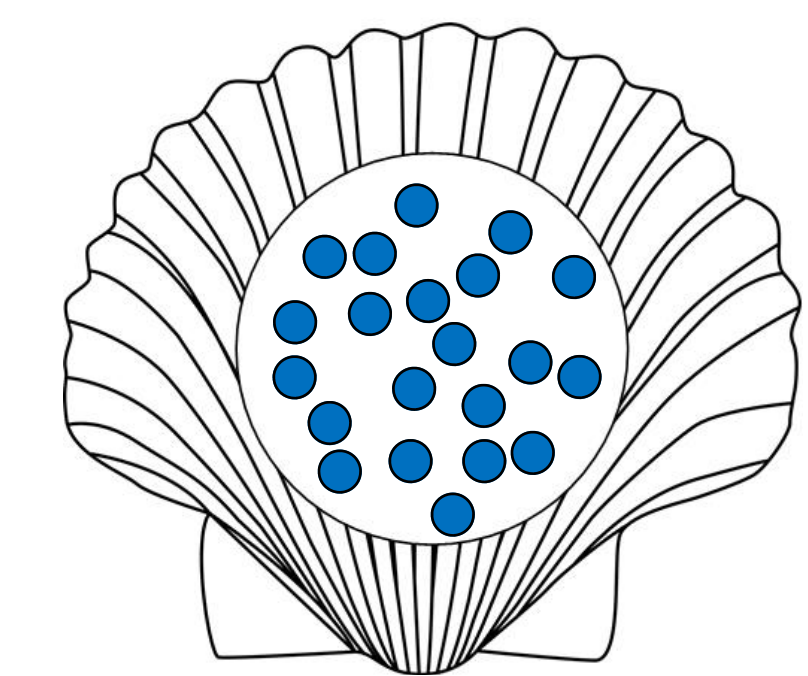
**CARBON 12**  
6 Protons  
6 Neutrons

**CARBON 14**  
6 Protons  
8 Neutrons

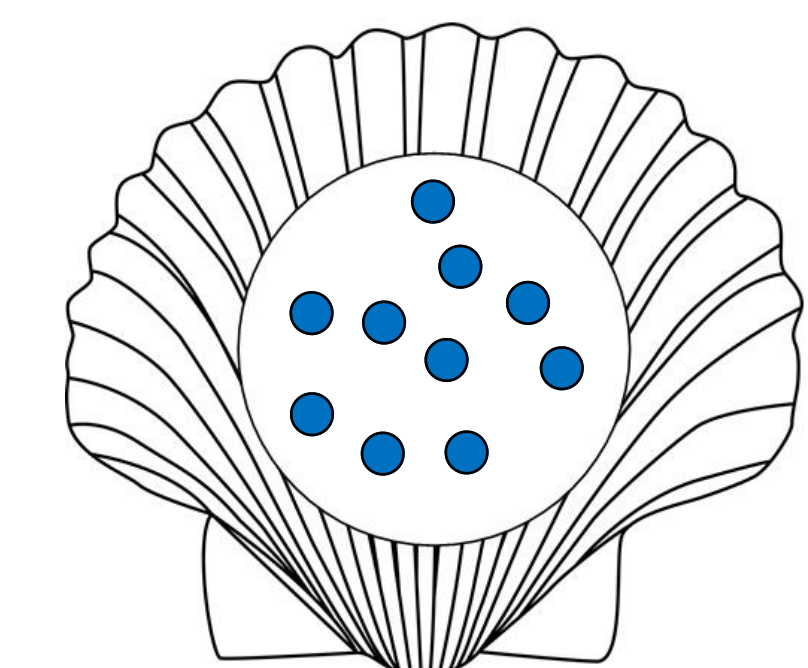
Carbon 12 and 14 are absorbed by all living things. The ratio of each is about the same as what is in the atmosphere.

However, when the plant or animal dies, the number of carbon-14 atoms start to decline. Scientists know the rate of decay and can measure the remaining carbon-14 in the object to determine how old it is. Carbon-14 dating can be used for organic objects 500 to about 50,000 years old.

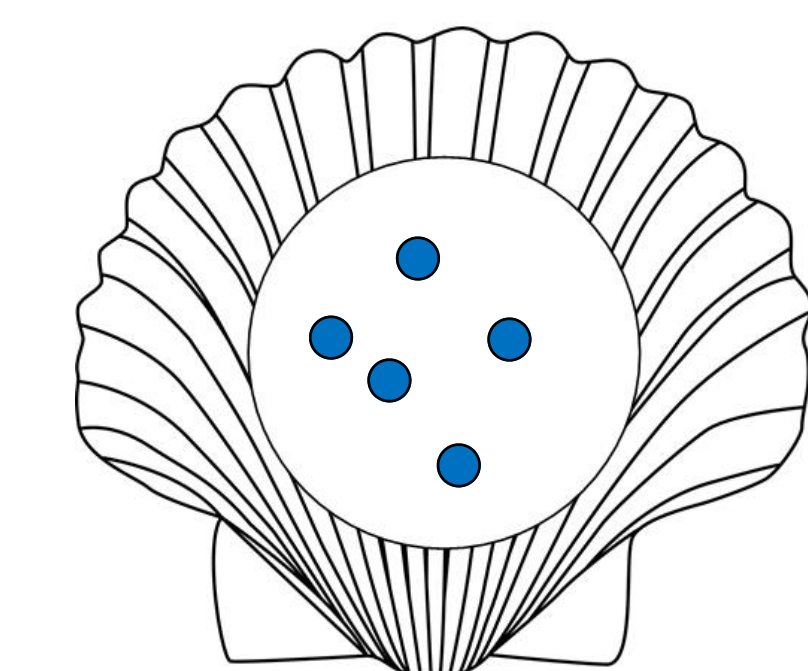
After the shellfish dies, the C-14 atoms began to decay. C-14 has a half-life of 5,730 years, so there would be half as many C-14 atoms after 5,730 years. By counting how many C-14 atoms remain, scientists can determine when the shellfish was alive.



Year 0  
100% C-14 left



Year 5,730  
50% C-14 left



Year 11,460  
25% C-14 left