

The task #3

Forum #7 - How is the past dated?

There are two primary techniques used to determine the age of fossils or related materials: relative and absolute.

Relative dates are based on the arrangement of artifacts or events in a sequence. Dates produced with this measurement are relative to one another but lack ties to calendrically measured time. As a result, relative dates are expressed as a range of time (date and +/- years). One example would be the arrangement of artifacts or fossils in a typological sequence or seriation based on stratigraphic analysis. Age is inferred based on the evidence surrounding the deposit/artifact/fossil. Here is an example of stratigraphic layers at an archaeological site in Canterbury. The same method applies to paleoanthropological efforts. Unless intrusion has occurred, generally, the deeper levels will be the oldest because they were deposited first.

By contrast, absolute (chronometric) dating methods rely on measurements derived from processing chemical, organic, or radiometric material. These are accurate and precise but do not always reflect when human interaction occurred. Some of these techniques can date rock material but that does not differentiate when a rock might have been shaped into a tool. Carbon dating is a well-known absolute method of dating based on the decay rate of the half-life of carbon isotopes. It is important to remember that each technique has strengths and weaknesses. When dating paleontological material, the greater the number of techniques and dates that can be determined about a site or find, the stronger the evidence to support conclusions based on those discoveries. Here is a hypothetical C14 dating sample.

The textbook lists many of the most common dating techniques and methods but there are tons of others, some quite unusual, you are welcome to explore.

Understanding how the past is dated is important so that we can assess other changes:

For example, let's consider that not all hominid characteristics evolved at the same time. The act of becoming human was a process of adding different components such as bipedalism, the manipulation of objects into tools, the physiological expansion of the brain, etc. These events occurred at different times in the history of hominin development...so... trying to determine the actual moment when our ancestors became recognizable as *humans* is complex. This is a highly contentious argument - you'll find different answers dependent upon identifying criteria.