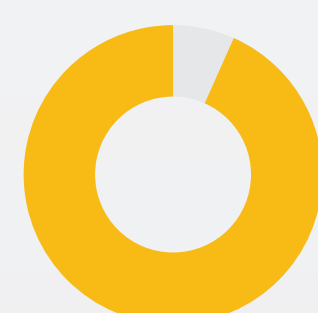
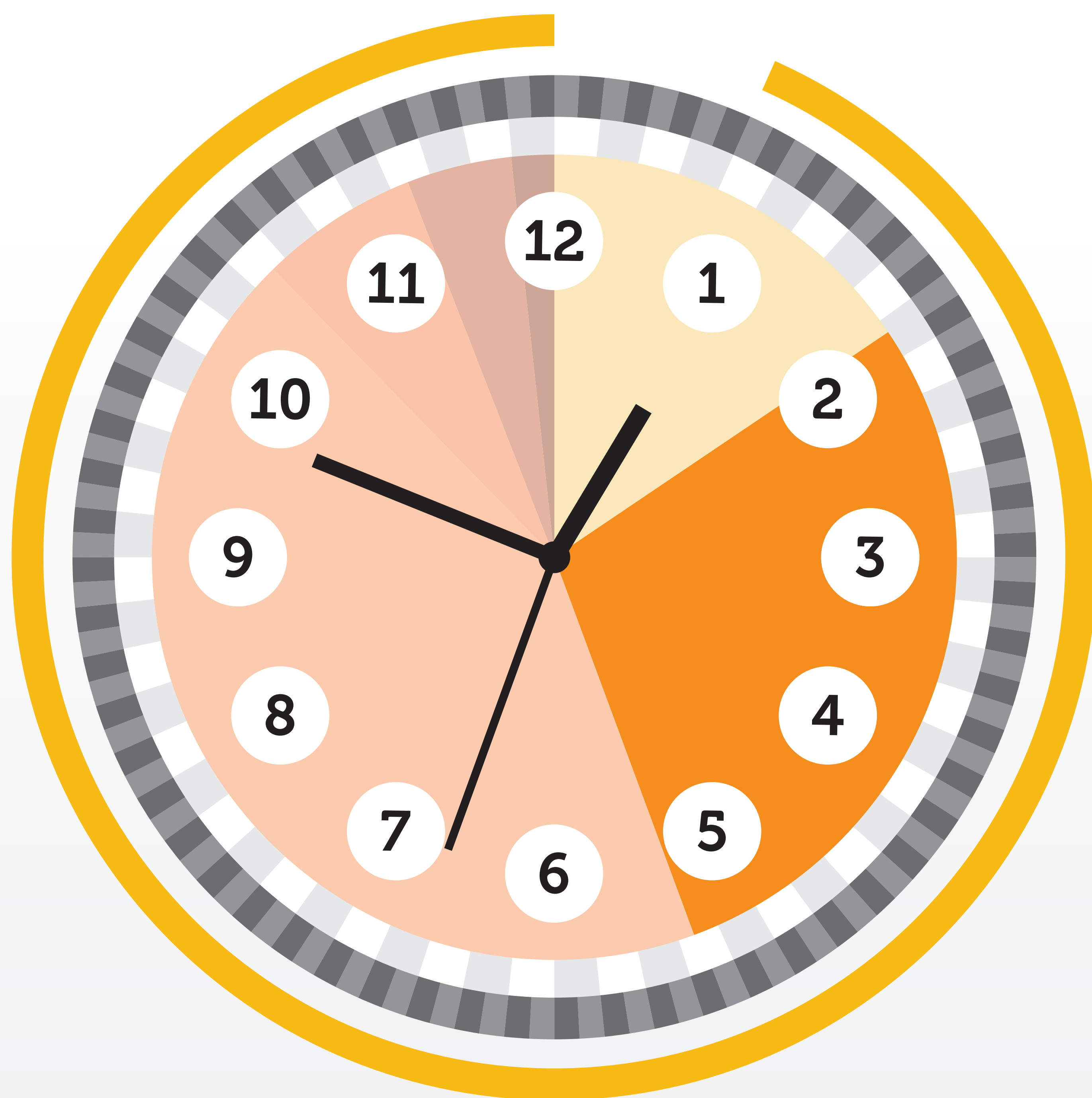


Important events in evolution

Significant events which impacted the history of Earth

3.9 billion years ago
The origin of life

01:49:33 HRS



Prokaryotes

Three types of evidence can help determine when life began.

The first consists of finding fossils, which are the remains of organisms trapped in rocks where minerals replaced their different body parts. The age of those fossils can be dated.

The second one is locating deposits with high Carbon content and looking for the fingerprints of life. The ratio between the two stable Carbon isotopes Carbon-12 and Carbon-13 provides the answer. If there is more Carbon-12 than Carbon-13, this is evidence of an organic material produced through photosynthesis. If there is less Carbon-12 than Carbon-13, that means it is an inorganic material, such as limestone, formed from the combination of carbon dioxide with calcium ions in sea water. And these rocks can be dated as well.

The third approach is the molecular evidence. Scientists know the time it takes for a mutation to appear and become stable in a species. Therefore, by finding differences in the genome of two species, it is possible to estimate how far apart they are in evolutionary history. The age of the most recent common ancestor of two species can be determined too.

The consensus is that life appeared on the planet between 3.9 and 3.8 billion years ago. The first prokaryotic organisms were very simple cells lacking a nucleus. The best-known prokaryotes are bacteria.

Eventually, eukaryotes, cells containing a nucleus and membrane-bound organelles, appeared 1.5 billion years ago, as the result of symbiosis between organisms of different species.