



STARDOME OBSERVATORY & PLANETARIUM FACTS, RESOURCES AND ACTIVITIES ON...

LIFE ON EARTH!

As far as we know, life requires liquid water. It is possible that life began on Earth soon after it cooled enough for liquid water to exist, but the earliest evidence of life came almost 1 billion years later. The earliest lifeforms that we know of were simple bacteria and organisms living in the early ocean. For a very long time, it seemed that these tiny, single-celled creatures were the only life on Earth.

Although they were small, these creatures had dramatic effect on our young planet. For example, were you to step back in time to when life first began you'd find it impossible to breathe. There was little to no oxygen in the air back then! Oxygen only began to build up in our atmosphere when a group of these simple organisms known as cyanobacteria evolved a way of getting energy from sunlight. This process is known as photosynthesis, and involves the release of oxygen. Trees and other plants get their energy in the same way and keep the air enriched with the oxygen we need to breathe.

More complex lifeforms wouldn't appear until around 600 million years ago and once they did, they diversified quickly. The ancestors of jellyfish appear 580 million years ago followed by fish, 530 million years ago. Early relatives of crabs evolved 512 million years ago and the first corals appeared 490 million years ago. At this time, life was confined to the ocean but it didn't take much longer to get a foothold on land as well, with the first land plants appearing 450 million years ago.

On both land, and in the oceans, life continued to evolve and diversify. The first amphibians evolved 370 million years ago, reptiles 340 million years ago. A few tens of millions of years after the first reptiles, a group of animals called synapsids also evolved. Though reptilian in appearance, synapsids were not closely related to reptiles, rather, they were the ancestors of all mammals, including humans. It would be another 100 million years before one of Earth's most famous lifeforms came onto the scene; dinosaurs! For almost 150 million years, dinosaurs dominated the land of Earth while in their shadow,



CYANOBACTERIA. IMAGE CREDIT: WIKIPEDIA/COMMONS

While Earth seems to be the only planet in our Solar System with life, life almost certainly exists on some of the billions of other planets in the Universe.

true mammals evolved from the synapsids. But the reign of the dinosaurs would come to an end 65 million years ago when an asteroid struck what is now named the Yucatan Peninsula in Mexico. This event caused the extinction of most species alive on Earth at the time, including almost all dinosaurs with the exception of some birds, and the Tuatara.

In the wake of this massive extinction event, mammals took over. Our primate ancestors evolved a few million years after the asteroid impact that took out the dinosaurs but humans did not arrive on the scene until very recently indeed. The first close relatives of humans evolved only 1 million years ago. Modern humans, only 100,000 years ago.

Check out this other resource...

http://www.bbc.co.uk/science/earth/earth_timeline

DISCUSSION POINTS

What might life look like in the future?

Some very strange lifeforms existed in the distant past. Find the oddest looking creature from Earth's past that you can. Why does it look the way it does?

SCIENCE CONTENT/CURRICULUM LINK

NATURE OF SCIENCE - INVESTIGATING IN SCIENCE AND EXTENDING THEIR EXPERIENCES AND PERSONAL EXPLANATIONS OF THE NATURAL WORLD THROUGH EXPLORATION, PLAY, ASKING QUESTIONS, AND DISCUSSING SIMPLE MODELS



ACTIVITY

STARDOME OBSERVATORY & PLANETARIUM

WORLD HISTORY IN ONE DAY



Objective...

For this exercise, we're going to condense the entire history of Earth into a 12-hour clock! The Earth is over 4 billion years old. That's a very hard number to conceptualise. The Earth Clock helps students visualise how long it took the Earth to form, the important events in Earth's history, and how little time humans have been present.

You'll need...

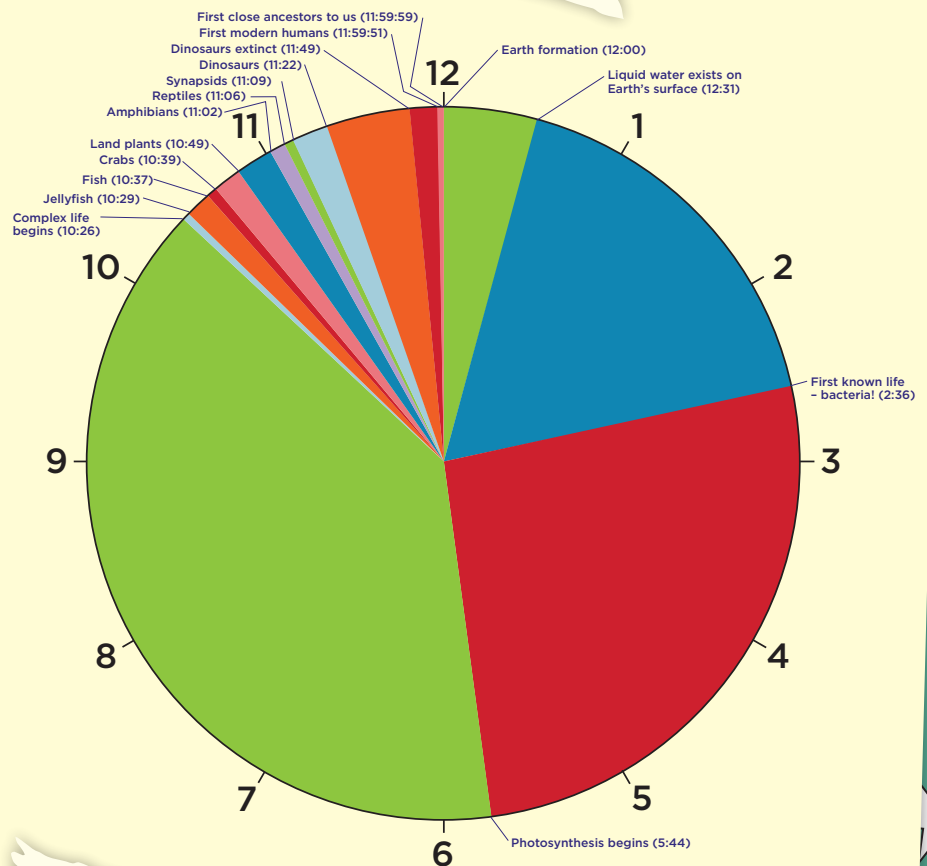
- ⇒ Life on Earth resource
- ⇒ Clock template

Instructions...

Using the Life on Earth resource and the clock template, ask your students to plot where they think the following events occurred:

- Earth formation (12:00)
- Liquid water exists on Earth's surface (12:31)
- First known life - bacteria! (2:36)
- Photosynthesis begins (5:44)
- Complex life begins (10:26)
- Jellyfish (10:29)
- Fish (10:37)
- Crabs (10:39)
- Land plants (10:49)
- Amphibians (11:02)
- Reptiles (11:06)
- Synapsids (11:09)
- Dinosaurs (11:22)
- Dinosaurs extinct (11:49)
- First modern humans (11:59:51)
- First close ancestors to us (11:59:59)

One hour = 383,333,333 million years



Check out this helpful clip...

⇒ www.youtube.com/watch?v=H2_6cqa2cP4

BE IN TO WIN!

Send in photos of your classes Earth Clock and you'll go in the draw to win a Gallileoscope for the class and a free pass to Stardome for each student. Email us on education@stardome.org.nz



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ACTIVITY

WORLD HISTORY IN ONE DAY CLOCK TEMPLATE

