

Worksheet: Beliefs about the origins of life

FET Phase

Grade 10 - 12

Learning area: Life Sciences

Strand: Diversity, change and continuity

Theme: History of life on Earth

Specific Aim 1: Acquiring knowledge of natural sciences

Specific Aim 3: Appreciating and understanding the importance and applications of natural sciences in society



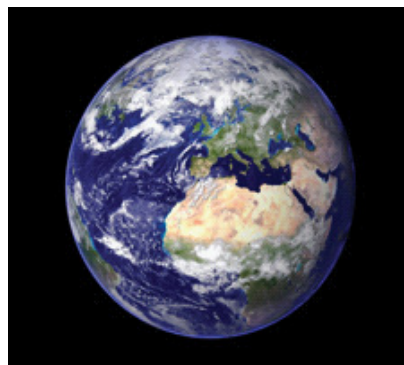
Activity Sheet

HOW DID LIFE START?

Evolution has taken place over millions of years and is responsible for all the living things on Earth today. There are different views and theories about the origin of life and the evolutionary process. It is important that we become aware of the different scientific theories, historical and theological beliefs regarding the origin of life, so that we can decide for ourselves which is the most plausible.

We do know that:

- the Earth is about 4.6 billion years old.
- there is fossil evidence that life existed on Earth at least 3.5 billion years ago.
- early Earth was hotter than today and the atmosphere consisted mostly of carbon dioxide, together with other gases such as ammonia and methane.



It is impossible to repeat the exact events of the origin of life in any demonstrable way. Scientists have replicated some of the events thought to have occurred during the Big Bang.

The major theories accounting for the origin of life on Earth are:

1. **Special creation** - life was created by a supernatural being at a particular time
2. **Spontaneous generation** - life arose from non-living matter on numerous occasions
3. **Steady-state** - life has no origin
4. **Cosmozoan** - life arrived on this planet from elsewhere
5. **Biochemical evolution** - life arose according to chemical and physical laws



6. **Cosmology** –15,000 million years ago there was a massive explosion causing all matter in the universe to form
7. **Evolutionary biology** - the idea that life might have originated with very simple cells and later developed into what we see today through the mechanism of evolution



Activity: Research a theory

Carry out research on these theories, describing the main features and historical events on which they are based. Complete your study with a discussion based on what you believe to be the most credible theory.



Teacher notes

The major theories accounting for the origin of life on Earth are:

Special creation - life was created by a supernatural being at a particular time. Creation of the world as described in the Bible explains the tenants of creation in both Judaism and Christianity. According to the Bible, the world was created during six days (seven, including the day of rest). On the first day, the sky and the Earth were created, but the Earth was covered with darkness and it was covered with water. So God created light. On the third day God created land that was divided from the water. He created plants, grass, trees, etc. On the fourth day, God created the moon and the sun to divide the day from the night, the moon was the sign of the night, and the sun was the sign of the day. On the sixth day God created reptiles, animals and birds. It was the first creation of a live being. On the sixth day, God created human beings that would reign over the birds, animals and reptiles. On the seventh day, God rested.

Spontaneous generation - life arose from non-living matter. This theory of life was widespread in ancient Chinese, Babylonian and Egyptian thought as an alternative to special creation, with which it coexisted. Aristotle also believed that life arose spontaneously.

Steady-state - life has no origin. This theory states that the Earth had no origin and has always been able to support life. This theory proposes that species never originated, they have always existed and that in the history of a species the only alternatives are for its numbers to vary, or for it to become extinct.

Cosmozoan - life arrived on this planet from elsewhere. This theory states that the origin of life could have had an extra-terrestrial origin. This theory states that life could have arisen once, or several times, in various parts of our galaxy or the Universe. There are several claims that objects bearing resemblance to primitive forms of life on Earth have been found in meteorites, and in 1996 NASA scientists in the USA identified what they thought could be the remains of bacteria-like organisms in a rock from Mars.

Biochemical evolution - life arose according to chemical and physical laws. According to this theory there were three stages that led to the appearance of life on Earth, they were the appearance of organic matter, the appearance of protein and the appearance of protein bodies.

Cosmology -According to this theory, about 15 billion years ago (15 000 000 000) the universe was nothing more than a very small speck of mass. This speck was probably no bigger than the head of a pin. Everything in the universe, all the galaxies, stars, planets, and even the matter making up your body was squished up tightly in this tiny space. Eventually, after a very long time, this speck exploded. All of a sudden, in a giant flash of unimaginable heat and power, the universe was born. Over a period of billions and billions of years, the universe became what we see today. Slowly stars began to form, and around these stars, planets formed.

Evolutionary biology - the idea that life might have originated with very simple cells and later developed into what we see today through the mechanism of evolution.

