

## Science KS3 Evolution and extinction

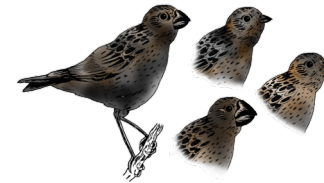


### Glossary:

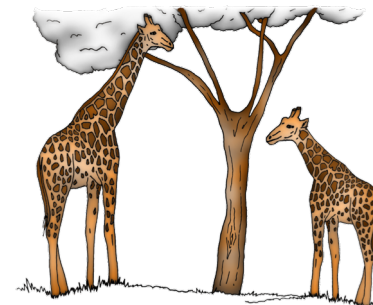
- **Adaptation**  
Characteristic of an organism which makes it suited to an environment.
- **Egg** Female sex cell.
- **Evolution**  
Changes to a species over time. Can involve the production of a new species.
- **Extinct**  
All organisms in a species have died.
- **Fertile**  
able to produce offspring.
- **Fossil**  
The preserved remains or traces of a dead organism.
- **Inherited**  
Passed from one generation to the next.
- **Multi-celled organism**  
An organism made of many cells.
- **Mutation**  
Error when copying a gene during cell division.
- **Natural selection**  
theory of how evolution happens.
- **Offspring**  
Children.
- **Organism**  
Individual in a species.
- **Reproduce**  
produce offspring.
- **Selective advantage**  
Better adapted to the environment.
- **Single-celled organism**  
Organism made of one cell.
- **Species**  
A group of similar organisms which can breed and produce fertile offspring.
- **Sperm**  
Male sex cell.
- **Universal common ancestor**  
A single-celled organism from which all life on Earth evolved.
- **Variation**  
differences between organisms of the same species.

### Activities

- Charles Darwin travelled to the Galapagos Islands and noticed how the beaks of the finches were adapted to suit their food source. Research how his observations led to his theory of evolution by natural selection.



- Explain how the following organisms are adapted to suit their environment:
  - a) Cactus plant
  - b) Penguin
  - c) Camel
  - d) Snowshoe rabbit.
- Giraffes have evolved long necks over time. Use the theory of natural selection to explain how this might have occurred. You should include the key words: population, variation, selective advantage and reproduction in your response.



- Look at the following image of the limbs of the two animals.



What evidence is there that these organisms evolved from one common ancestor?

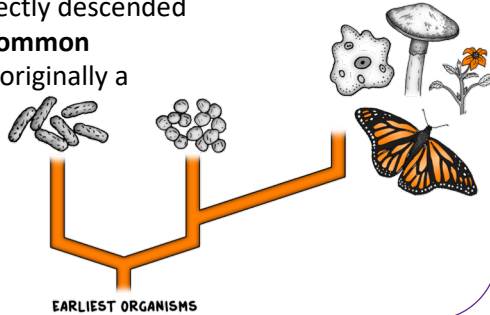
- The fossil record is incomplete. Carry out research to find out what this means and why this is the case.

### QUICK QUESTIONS:

1. What is the difference between single-celled and multi-celled organisms?
2. What is meant by the term 'extinct'?
3. What does the fossil record tell us?
4. What have all organisms on the planet evolved from?
5. What does the term 'selective advantage' mean?
6. Define the term 'species'.

### 1. Universal common ancestor

- All life today is directly descended from a **universal common ancestor** that was originally a **single-celled organism**.



### 4. Competition and survival

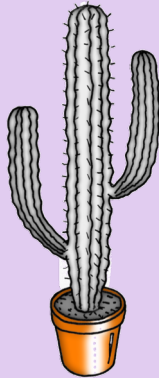
- Later generations will contain **more** of the **better adapted** individuals.
- This only applies to **mutations** in the reproductive cells e.g. sperm and eggs. Mutations in other cells are not passed on to the offspring.

### 6. Natural selection over time

- Natural selection** has been taking place for billions of years.
- The first form of life appeared on Earth about 3.5 billion years ago.
- Some of these remained as **single-celled species**. Others evolved into **multi-cellular organisms** about 2 billion years ago. These multi-cellular organisms eventually evolved into today's large animals, plants and fungi.

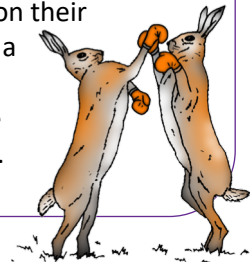
### 2. Adaptation

- Living things are found in certain environments because they have features that enable them to survive there. They have **adapted** to suit the environment.
- This adaptation has happened because of the small differences between individuals in a species; **variation**.



### 3. Competition and survival to reproduce

- Organisms within a **species compete** for the same resources e.g. food or a mate.
- Those who are better **adapted** to the **environment** are more likely to **survive** and may pass on their **adaptation** to their **offspring**. They have a **selective advantage**.
- Those less suited to the environment are more likely to die before they **reproduce**.



### 5. Natural selection

- Charles Darwin's** theory of **natural selection** explains how **evolution** happens:
  - There is **variation** in a population
  - Some individuals are **better adapted** to changes in the environment, they have a **selective advantage**
  - These individuals are **more likely to survive** and pass on their **genes**.
  - Over **many generations** this leads to **evolution**.

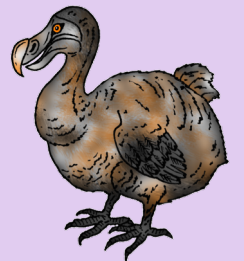


KS3 Spine

## Evolution and extinction

### 7. Extinction

- There are many kinds of animals in the world today and many who once lived, but are now **extinct**.
- A species becomes **extinct** when all the organisms of that species have died.
- We know about many of these extinct animals and plants because of **fossils**.



### 8. Evolution

- Change of species over time is called **evolution**.
- Analysing closely-related species or fossils can show us how species have changed over long periods of time.

