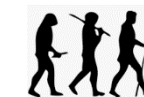
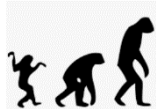
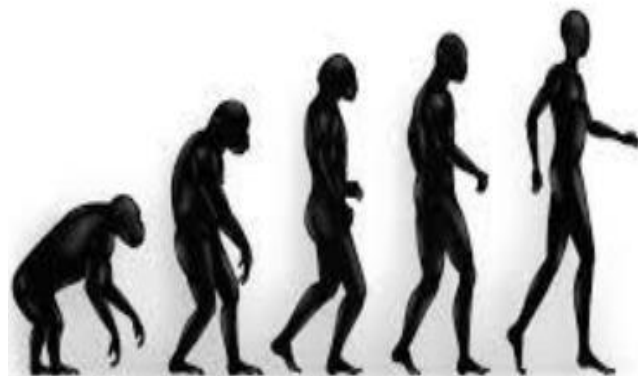


# EVOLUTION and INHERITANCE



## What is the evidence for evolution?

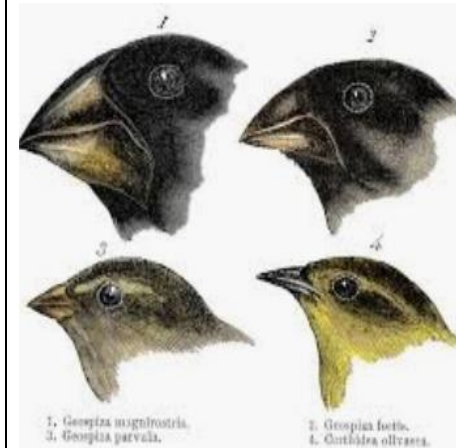
### Overview



- Evolution is a change over time. It occurs when there is competition to survive (natural selection).
- Characteristics are passed from parents to their offspring. This is called inheritance.
- Offspring are not identical to their parents. Some characteristics are inherited, but some are new in the offspring – these are called mutations.
- Fossils are remains of living things, and provide evidence about living things from the past.
- Animals and plants are suited to their environments, and adaptation leads to advantageous changes.

### Evidence for Evolution

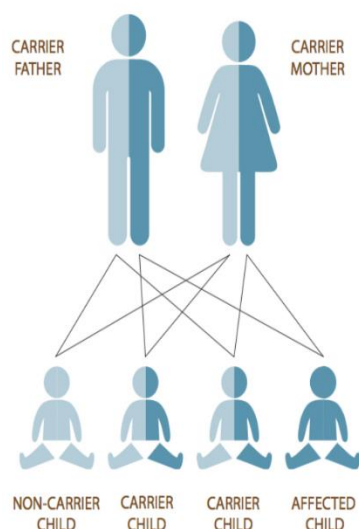
**Fossils are the remains of living things, found in sedimentary rocks.**



- When paleontologists compare animals in fossils to animals today, they can see similarities and differences between them.
- e.g. Fossils show that giraffes necks did not used to be as long. They have developed over time to reach high branches.
- Living things also provide evidence of natural selection and evolution.
- e.g. On the Galapagos Islands, Charles Darwin found differences between finches from island to island. They had adapted for the different foods that they eat.

### Inheritance and Mutation

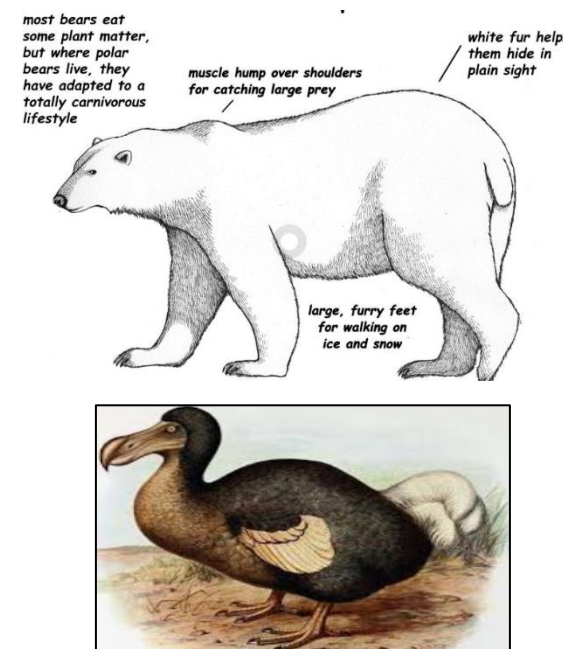
Evolution is the name given for changes to a species over time.



- Living things produce offspring of the same kind.
- Some of a parent's characteristics are passed down to the offspring – this is called inheritance.
- This is why we often share similar features with our parents, and some conditions are shared (see image).
- Inheritance is genetic, not environmental. E.g. If two blonde-haired parents dye their hair black, this does not mean they will have a black-haired child.
- Some features are new to the offspring. These are called mutations. This is why we are not exact copies of our parents.
- These changes in offspring over time allow evolution to take place.

### Adaptation

Evolution & natural selection have enabled living things to adapt to their environments.



- Sometimes, changes that offspring have from their parents are advantageous – they allow the offspring to cope better in their environment.
- However, often the changes are not advantageous (called maladaptations). When this is the case, the offspring will find it more difficult to thrive.
- Natural selection can ensure that, over time, the advantageous characteristics survive in the species.
- For example, many polar animals have adapted to possess layers of blubber and/or fur (for warmth) and white outer coats (for camouflage).
- The dodo, with no predators on its island, had adapted in a number of ways that made it unable to survive when humans arrived (maladaptations).

### Adapted to Warm Environments

Camels



Fennec Fox



Kangaroo



### Adapted to Cold Environments

Penguin



Seal



Polar Bear

