*'Bringing Learning to Life: No Limits.No Barriers.'*

Ocean Academy Poole
an Aspirations Academy
Self-Worth | Engagement | Purpose

# Learning Journey Map

Year: **6** Term: **SPRING 1**
Subject: **SCIENCE** Topic: **EVOLUTION AND INHERITANCE**

**Driving Question:** How can we use careful researching to categorise an animal based on their evolutionary traits?
**Power Skill:** **Critical Thinking -** I can identify and retrieve the information I need to solve a problem from a range of sources.

**National Curriculum Learning Objectives**

- *recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago*
- *recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents*
- *identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution*

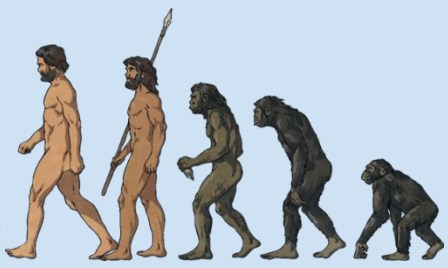
**Key Vocabulary**

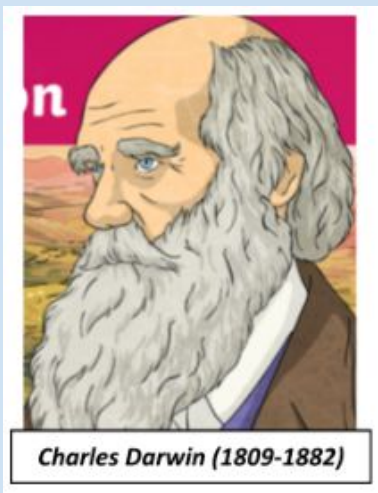
| | | | | |
|---|---|---|---|---|
| Evolution | Adaptation | Inheritance | Species | Variation |
| Charles Darwin | Habitat | Traits | Natural selection | |

## Key Learning

Key Definitions:
Evolution: The way a living thing gradually develops and changes over time.
Inheritance: The passing on of traits or characteristics from parents to their offspring through reproduction.
Adaptation: The process of change by which a living thing becomes better suited to its environment.

The Theory of Evolution:
Charles Darwin (1809-1882) introduced the theory of evolution. He was a famous English naturalist (an expert in studying nature), biologist (an expert in living things) and geologist (an expert in rocks and fossils). He discovered that humans and apes shared common ancestors, which led to this famous image:




Charles Darwin (1809-1882)

Charles Darwin published his scientific theory of natural selection in a book called 'On the Origin of Species' in 1859. Darwin's theory explained how every living thing is connected in a family tree that stretches back billions of years to the beginning of life on Earth.
Charles Darwin observed that, although individuals in a species shared similarities, they were not exact copies of each other; there were small differences or variations between them.
He also noticed that everything in the natural world was in competition.

The winners were those that had characteristics, which made them better adapted for survival.
These living things were more likely to reproduce and pass on their useful characteristics to their offspring.
Animals who were poorly adapted were less likely to survive and their characteristics were less likely to be inherited.

Over time, the characteristics that help survival become more common and a species gradually changes.
Given enough time, these small changes can add up to the extent that a new species altogether can develop/evolve.

Thinking Point
Why do you think people were/are so sceptical about Darwin's theory of evolution?



Explore and Investigate
**Analyse the advantages and disadvantages of specific adaptations:**
Observing and researching various living things in the local environment or those living in extreme conditions, make observations of their characteristics and try to explain why they have adapted this way.

Comparing similar species living in different climate zones/biomes, make observations of the similarities and differences in characteristics and try to explain why and how these adaptations have occurred. (zebra and horse)

Looking and observing the characteristics of various living things, analyse the advantages and disadvantages of specific adaptations, such as being on 2 feet rather than 4, having a long or a short beak, having gills or lungs, tendrils on climbing plants, brightly coloured and scented flowers. Can they explain these adaptations?

‘Bringing Learning to Life: No Limits.No Barriers.’

# Key Learning




<u>What sort of changes?</u>
Animals and plants evolve through generations to make adaptations to survive and survive better. Some of these changes are down to habitats and lifestyle.

As part of his most famous expedition to the Galapagos Islands (off of the west coast of South America), Darwin studied different finches living in different parts of the Galapagos Islands and realised, even though they were different, they all had the same ancestors.



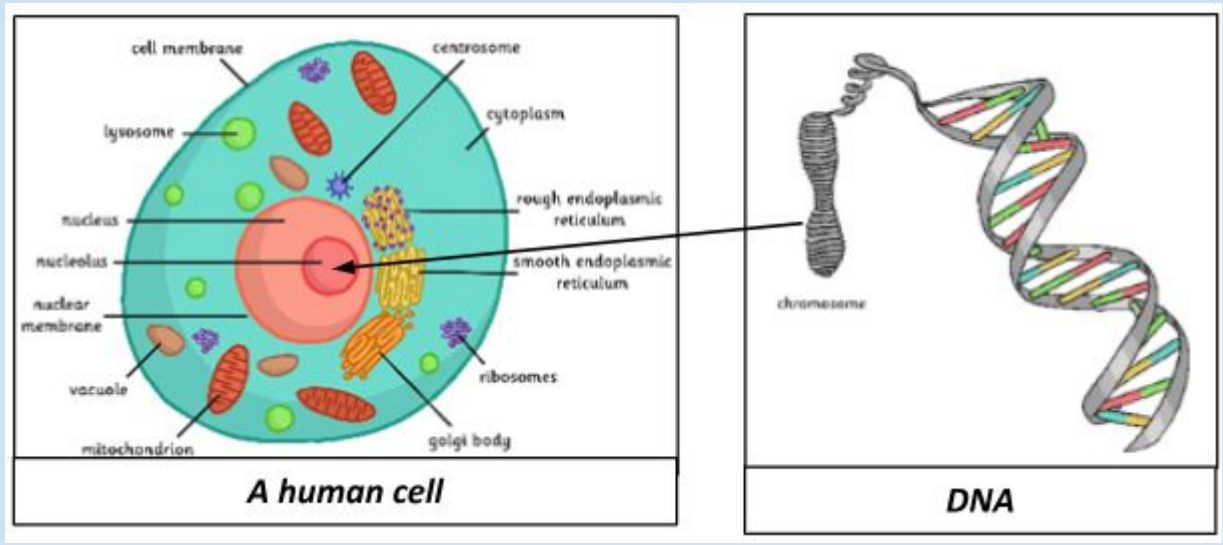
Looking at these finches, you will notice how different they are from one another even though they all originate from the same single species of finch.
The Galapagos islands are made up of 127 islands (19 large and 4 inhabited).
As the finches spread and settled across the different islands, they were faced with differences in: the habitat, the food available and the types of predators around – they had to adapt.

On some islands, the food was only accessible if the finches had larger beaks and therefore, over time, the birds with smaller beaks were unable to survive and died out. As only the finches with larger beaks were able to survive and reproduce, eventually, only finches with large beaks were now existing on these islands. However, on other islands, a smaller beak was advantageous for gathering food and therefore, over generations, all finches on these islands had small beaks.

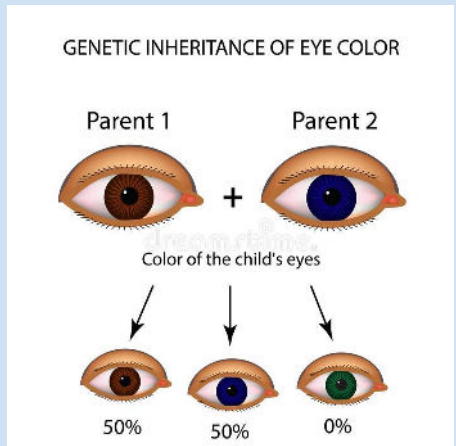
This was also the case with the patterns and colour of the birds’ feathers. Depending on the plants and colour of these on the island, certain finches had a better chance of evading predators and others did not. Hence why, on different islands, the birds (from the same ancestors) now have different colour feathers. This is a direct observation of evolution over time.

<u>Thinking Point</u>
Can you think of another species which has lots of variation depending on where they are live?

<u>Inheritance:</u>
To understand inheritance, we need to understand a little bit about cells and DNA.
Cells are the building blocks of all living things. All living things are made up of cells. Humans have trillions of cells!
Inside each cell is a nucleus. This part of a cell contains chromosomes, which are made up of DNA.
DNA carries the characteristics that we inherit. It is located in the nucleus in the cell.
DNA can replicate and make copies of itself. When cells divide, each cell needs to have an exact copy of the DNA in the old cell.




When we talk about inheritance, we often mean things that are passed on to us when one of our relatives or friends has died. Inherited items are sometimes houses or important objects.




In science, inheritance refers to the genes that are passed on from parents to offspring: The DNA coding that makes you who you are is a mixture given to you by both of your parents.
That’s why you are not exactly identical to either of them but you are similar to both.
When we refer to inherited characteristics we tend to focus on physical characteristics as these are easy to spot but inherited characteristics include abilities, such as taste and smell.

Inheritance is when this DNA, coded with characteristics, is passed on to the offspring from their parents through sexual or asexual reproduction. The offspring inherit the characteristics from both parents but the way they combine makes the offspring unique.
The inherited characteristics can combine in different ways, which is the reason why siblings inherit the same characteristics but are not identical to each other. Even identical twins that share the exact same combination of DNA are not 100% the same!
This is due to the fact that genes develop separately when the twins are embryos (early development in the womb) or during later development.

<u>Thinking Point</u>
Why, because of inheritance, are you not exactly identical to your siblings?

