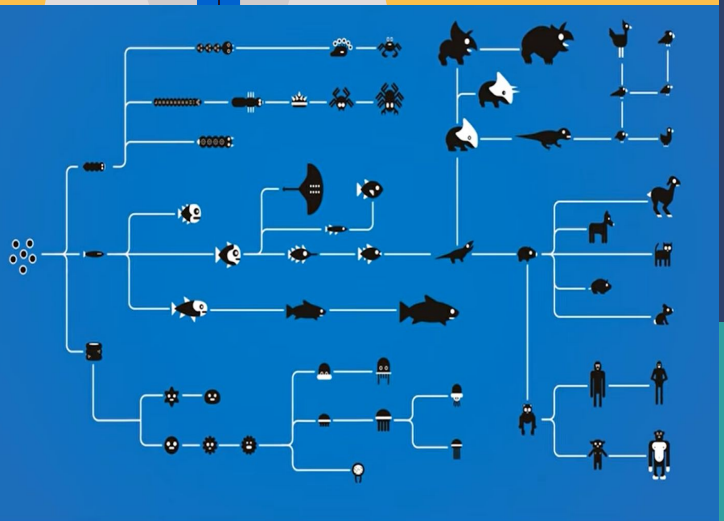


Evolution

Is the development of life on earth through millions and millions of years, which actually still continues to this day.

First of All What is a Species?

A species is a community of animals that can reproduce with each other and that produces an offspring that can also reproduce.

What are the Theories of Evolution ?

CONTROVERSIAL

Natural Theology

This is the theory that there was one divine creator "God", that he created all beings to be perfectly adapted to their surroundings, that living creatures never changed, and that the earth was only 6,000 years old.

Jean-Baptiste Lamarck's Theory of Natural Mutation

His theory was that animals develop mutations in their struggle to eat or to survive for example if a giraffe needs to eat from a very tall tree it will mutate to have a longer neck and then pass this mutation on to his offspring.

Alfred Russel Wallace's & Charles Darwin's Theory of Natural Selection

Natural selection is the process by which the animals which have the best characteristics depending on their environment would survive because they have qualities which are suitable for that environment. Over years these characteristics develop further and create different species which is how animals evolve.

How does Evolution Actually Happen ?

Excess Production:
Normally animals will produce bigger amounts of offspring than needed this is because the environment could kill some of them. This overproduction helps create bigger diversity within species and more animals will survive and therefore there will be bigger variations in a species due to natural selection. This bigger diversity is created because our parents dna mixes randomly creating infinite possibilities of us the bigger that population the bigger the likelihood of the wanted traits being passed on.

UNIQUENESS

Each animal carries unique traits these traits are supposedly better and lead to the evolution of animals

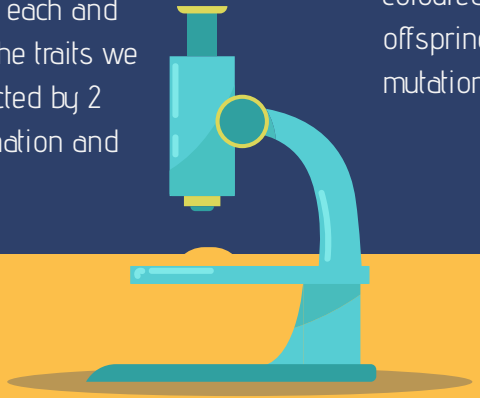
Heredity: We get variation within a species because traits from our parents are passed on to us through genes. (further explained in the next slide)

NATURAL SELECTION

Animals with the more suitable traits for their environment will survive and will pass on traits that help them survive

Heredity

Our cells contain a nucleus and inside that nucleus you find mitochondria which contains our DNA. DNA contains genes which determine everything from our sex to the colour of our eyes. DNA is unique to each and everyone of us. The traits we pass on are affected by 2 factors Recombination and Mutation.

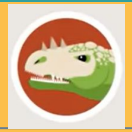


Recombination: Our DNA is made out of the random recombination of half our mothers chromosomes and half our fathers chromosomes. therefore we can pass along traits. This is essential for Natural selection to happen. The mixture of our mother's egg cell and our fathers sperm cell happens through intercourse(each sex cell containing 23 chromosomes.) When the genes mix they recombine in a random way and create offspring

Mutation: Mutations are random changes in DNA sometimes called copying errors. They are triggered by three things: Toxins, Radiation and chemical substances. Normally changes in DNA (Mutations) are bad like cancer however, Mutations can also be good like having blu coloured eyes. In order for mutation to have an impact on the offspring it must affect a sex cell. because these are the only way that mutations can be passed on

Factors that Affect Natural Selection

These factors will leave only the fittest alive which are able to withstand these factors and therefore the offsprings which are produced will also be able to survive be able to reproduce



Parasites/ Diseases

Predators

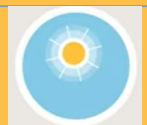
Changes in the Habitat

Natural selection Factors

Toxins

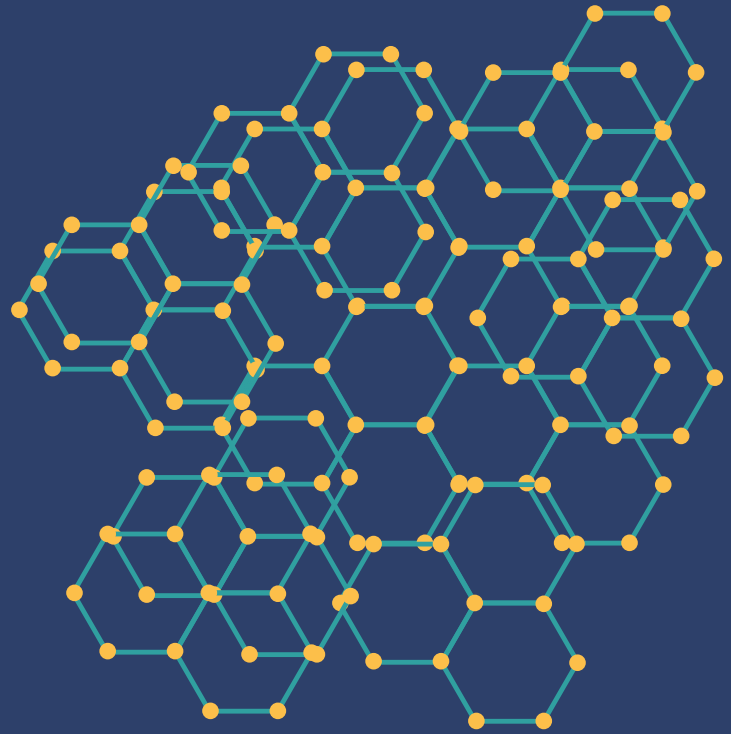
Climate

Animals from the same species

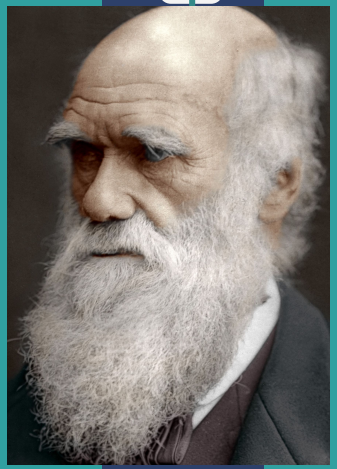


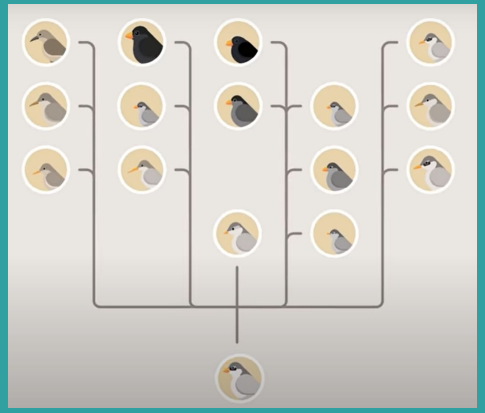
“Survival of the fittest”

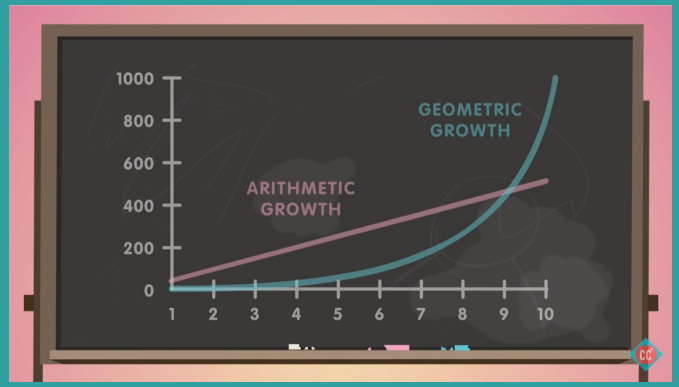
–Charles Darwin.
He first used this synonym of Natural Selection in the 5 edition of his book
“On the Origin of Species”



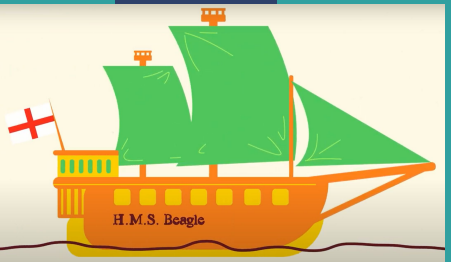
How did Darwin Figure it Out ?





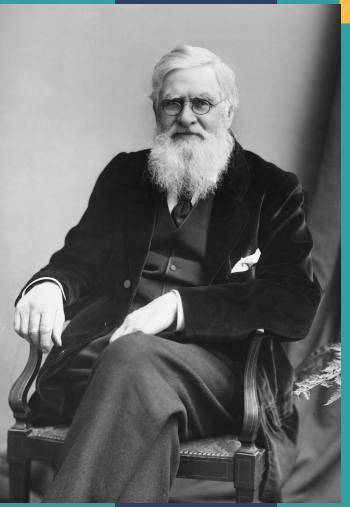


When Darwin graduated of Cambridge college his parents sent him to South America aboard the H.M.S. Beagle on a five year journey during this time he had time to think about lots of things: during his journey he found lots of fossils which looked like his modern day animals. But the most important thing he discovered was the various different animals on the Galapagos islands, specially the finches. The finches seemed to be very similar. However, They were slightly different from island to island. This was pointed out to him by the natives. When he got back he published the Zoology of the voyage of the H.M.S Beagle 1838- 1843. This made him very popular



Then he read the essay on the principle of population by Thomas Robert Malthus. Out of this he figured that there was link between the environment and the population and Darwin started to think that living being is compete over resources and the most fit for a specific region survive.. However, he wasn't completely sure about publishing a final edition of his Theory of Natural Selection. Until one day he got a letter from Russel wallace saying he had found out about Natural Selection

Who is Alfred Russel Wallace
&
How did he contribute to the theory of Natural Selection ?



When Darwin published "The Zoology of the voyage of the H.M.S. Beagle" Russel wallace was inspired by this and he came up with the Theory of Natural Selection as well, so he wrote to Darwin asking if he'd want to write a joint paper on Natural Selection. This was the nudge Darwin needed. Therefore, in 1858 they wrote a joint paper in the London Scientific society. One year later he published his book The Origin of the Species which explained in depth his theory of Natural selection

Sir Alfred Russel Wallace was born in a poor family and he had a few jobs here and there.Then he read Malthus's essay and Darwin's book and became a fan. He decided to go and explore with his friend Henry Walter Bates. to work out how evolution works and apply it on humans.

Myths and Misconceptions about Evolution

01

Organisms adapt to their environment.
This is wrong the organisms themselves to not change, nature benefits the organisms best suited for the environment and those organisms survive and therefore can pass their traits, which are better suited for the environment on

02

Survival of the fittest does not mean the biggest, strongest fastest animals, it means those which are better suited to their current environment

03

An organisms that dies without reproducing itself is evolutionary useless.
This is also wrong. If an organism dies without reproducing it is contributing to making the other traits which are important for survival more dominant,and his which are less suited for this environment die out with him.

04

There is no predetermined form of how an animal will turn out, nature shapes them to how they are best suited for their environment.

Personal Thoughts

Does natural selection with humans nowadays still happen ?