Big Question: How do scientists explain changes in nature?

① How do scientists know that living things have changed over time?

⇒ Palaeontologists use fossils from the ground to find about animals and plants from the past.

⇒ As a general rule, the deeper the palaeontologists dig, the further back into the past they can see.

⇒ By comparing the fossils over time, they can see how animals and plants evolved (changed) over millions of years.

⇒ This is often known as the fossil record, and it beneath our feet as we speak.

② How does variation explain the different features and characteristics of living things?

⇒ Animals reproduce with animals from the same species.

⇒ The differences between animals from different species is call diversity.

⇒ The differences between animals from the same species is called variation.

⇒ Every animal is unique because it is a product of two different animals, albeit from the same species. Even siblings will be different from each other.

③ How has variation led to evolution?

⇒ Every time a new animal is born a new variation is created from the combination of its parents DNA.

⇒ If the variation is a successful variation, the offspring will live and have its own offspring. The variation carries on.

⇒ If the variation is unsuccessful, the offspring will not survive to reproduce and the variation will not be continued.

⇒ Strong characteristics therefore survive, and weaker ones are bread out of future generations.

④ Do all living things adapt the same way?

⇒ All animals must adapt to their environment to survive. If the environment changes, so must the characteristics of the animal.

⇒ This results in **evolution**, the long term changes seen in species where successful characteristics overcome unsuccessful ones (known as survival of the fittest).

⇒ All living things respond and adapt to their needs — MRS GREN.

⇒ The rapid climate change we are experiencing is an example of a sudden change is serious because it could change environment quicker than evolution can react.

⑤ How have the plants in the local area adapted?

⇒ Need for sunlight on leaves results in trees which raise high to top of the canopy, others that can climb up other plants and others that produce large leaves.

⇒ Need for water result in plants that extend roots deep into the ground (many tree have roots that extend as deep into the ground as the branches into the air)

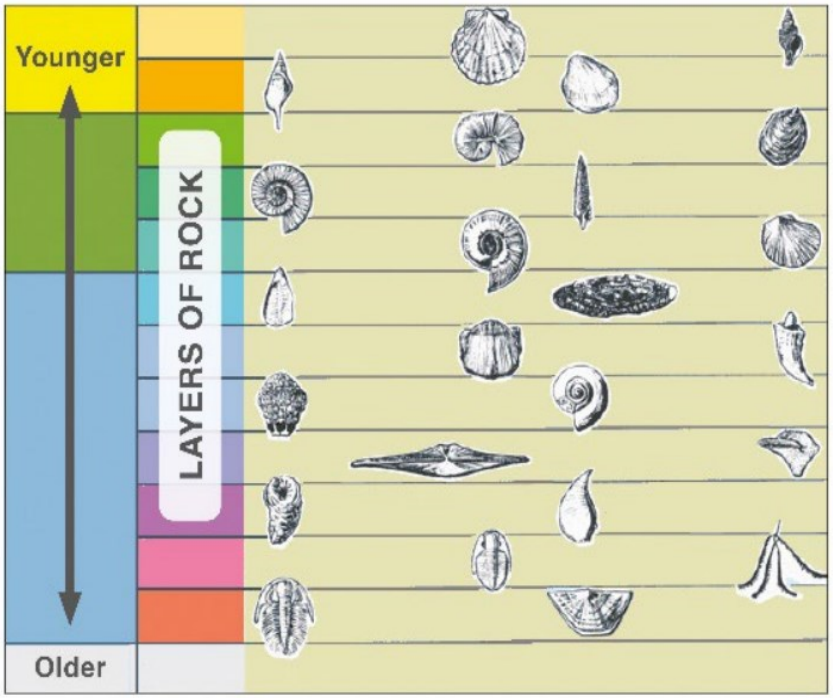
⇒ The flowers in plants attract pollinators to carry the pollen to other plants to make new plants.

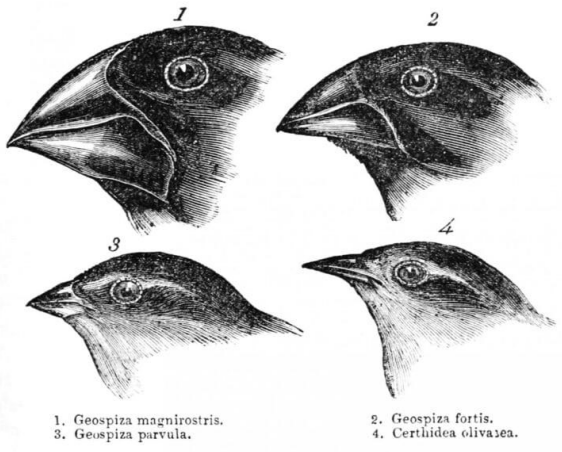
Core Vocabulary/Terminology

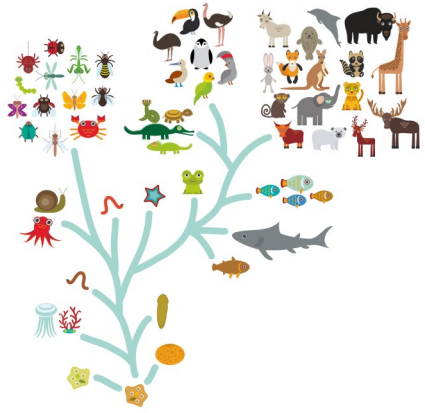
Evolution	The process by which different living things have developed from earlier examples of living things.
Inheritance	The explanation of how offspring of living things have the same or similar characteristics of their parents.
Physical Traits	Observable characteristics that you can see just by looking at a humans, plants or animals.
Characteristics	A feature of quality belonging to a living thing, that can be used to identify or classify them.
Habitats	The natural home or environment of an animal, plant or other organism.
Extinction	The dying out or extermination of a species.
Selective Breeding	The process where humans choose the particular animals or plants to involve in breeding to achieve a particular outcome *e.g. Two large animals of a species are chosen to breed together so the offspring will be large.*
Natural Selection	The process where the animals and plants best suited to survive in an environment are most likely to reproduce meaning the strongest survive and the weakest die out.
Adaptation	The way a plant or animal is suited to the environment in which it lives. E.g. Fur on a polar bear.
Variation	Explains how animals within a species are slightly different from every other. Offspring are different from their parents
Organism	The word to describe a living thing, as characterised by Movement, Reproduction, Sensitivity, Nutrition, Excretion, Respiration and Growth.
Fossil Record	The fossil record is the collection of fossils that remain within the ground.. They are like a timeline: the deeper you dig the further back in time you go.

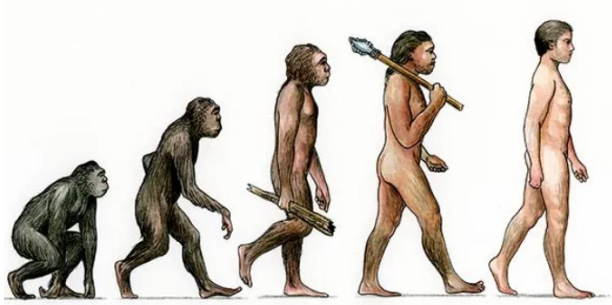
Science Knowledge Organiser – Evolution and Inheritance

RELATIVE DATING









Mould fossils – where there is an imprint in the rock of a living thing that has died.

Body fossil – the remains of dead animals and plants e.g. teeth, bones, shells, branches, stems. They have usually become entombed in rock or amber.

Trace fossil – a mark or imprint made by a living thing in wet mud.

Cast fossil – the imprint of a mould fossil fills in with minerals and this hardens.