Year 6 Science Knowledge Organiser: (Evolution & Inheritance)

Subject Specific Skills

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

Prior Learning

- Pupils should have some knowledge of fossils and how they formed.
- Pupils may know that humans 'came from monkeys'

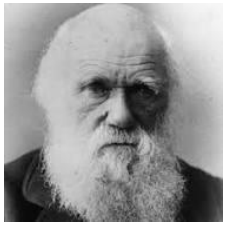
Key Knowledge:

- Building on what they learned about fossils in the topic on rocks in year 3, pupils should find out more about how living things on earth have changed over time. They should be introduced to the idea that characteristics are passed from parents to their offspring, for instance by considering different breeds of dogs, and what happens when, for example, labradors are crossed with poodles. They should also appreciate that variation in offspring over time can make animals more or less able to survive in particular environments, for example, by exploring how giraffes' necks got longer, or the development of insulating fur on the arctic fox. Pupils might find out about the work of palaeontologists such as Mary Anning and about how Charles Darwin and Alfred Wallace developed their ideas on evolution.
- Through the process of evolution, living things have changed and adapted to live almost everywhere on Earth. The theory of evolution describes how all living things make up one large family tree that stretches back over 3 billion years. We are all descended from a single common ancestor, with modern humans only appearing around 200,000 years ago.
- Humans have been able to speed up evolutionary processes to create new crops and livestock, which are artificially selected for specific desired characteristics such as better wool or sweeter fruit.

Key Vocabulary

Adaptation: The process by which a species evolves over time to become better suited to its environment.
Evolution: The gradual change in living things over many generations, due to changes in inherited characteristics.
Gene: Part of the DNA inside cells, through which inherited characteristics are passed down from parents to offspring.
Natural Selection: The process by which favourable characteristics become more common over time.
Artificial Selection: Selectively breeding plants and animals to produce new species that possess certain characteristics.

Key Individual: Charles Darwin



Key Knowledge:

- Four basic points underpin the theory of natural selection (Charles Darwin):

Individuals in a species show variation.
Variation is inherited, as characteristics are passed from parents to offspring.
Only some individuals survive to breed.
Individuals with characteristics most suited to their environment are more likely to survive and reproduce, meaning that successful genes are passed on to the next generation.

- Natural selection constantly rejects "bad" genetic variations and encourages "good" genetic variations (i.e. those that help an organism survive and reproduce). Over time, accumulating variations causes populations to diverge, and entirely new species form.
- Offspring inherit characteristics from both parents through genes. Genes determine characteristics including eye colour, hair colour and earlobe shapes. These are all examples of **inherited characteristics**.
- Some inherited characteristics can be altered. For example, hair can be dyed a different colour and plastic surgery can alter a person's appearance. But these changes are only superficial – our genes stay the same.
- **Acquired characteristics** are not inherited. They involve changes to the structure or function of a living thing during its lifetime. Acquired characteristics can result from repeated use, disease or other environmental factors.
- Pedigree dog breeds have been deliberately bred to be different shapes, sizes and colours. Selective breeding can produce crops that are resistant to diseases.
- Look closely at one animal in detail – for example, they could research how the ancestors of modern horses changed over time, using evidence from the fossil record.