

Year 5 Science

ALL TOPICS will be taught using practical scientific methods

All living things

Objectives	Notes and guidance	Activities/Experiments
<ul style="list-style-type: none">- Describe the life cycles common to a variety of animals, including humans (birth, growth, development, reproduction, death), and to a variety of plants (growth, reproduction and death).- Explain the classification of living things into broad groups according to common observable characteristics and based on similarities and differences, including plants, animals and micro-organisms.- Describe the life process of reproduction in some plants and animals.	<ul style="list-style-type: none">- Find out about the work of naturalists and animal behaviourists such as David Attenborough and Jane Goodall.- Build on their learning about the classification of all living things in Year 4 by looking at the classification system in more detail. They should be introduced to the term 'kingdom' and learn that most scientists classify things into 'five kingdoms' (bacteria, protists, animals, plants and fungi).- Through direct observations where possible, they should classify animals into vertebrates (reptiles, fish, amphibians, birds and mammals) and invertebrates.- They should find out about different types of reproduction, including sexual and asexual reproduction in plants.	<ul style="list-style-type: none">- Ask pertinent questions and suggesting reasons for similarities and differences.- Work scientifically by: devising classification systems and keys to identify some animals and plants in the immediate environment.- Pupils might try to grow new plants from different parts of the parent plant, for example seeds, stem and root cuttings, tubers, bulbs.- They might observe changes in an animal over a period of time (for example, by hatching and rearing chicks); comparing how different animals reproduce and grow.

Light

Objectives	Notes and guidance	Activities/Experiments
<ul style="list-style-type: none">- Understand that light appears to travel in straight lines.- Use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye.- Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them, and to predict the size of shadows when the position of the light source changes.	<ul style="list-style-type: none">- Explore the way that light behaves, including light sources, reflection and refraction. Talk about what happens and make predictions.- Experience a range of examples of interesting aspects of light such as rainbows, colours on soap bubbles, objects looking bent in water and white light being split by prisms.	<ul style="list-style-type: none">- Work scientifically by; deciding where to place rear-view mirrors on cars; designing and making a periscope and using the idea that light appears to travel in straight lines to explain how it works.- They might investigate the relationship between light sources, objects and shadows by using shadow puppets.

Forces

Objectives	Notes and guidance	Activities/Experiments
<ul style="list-style-type: none">- Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object.- Identify the effect of drag forces such as air resistance, water resistance and friction, that act between moving surfaces.- Describe, in terms of drag forces, why moving objects that are not driven tend to slow down.- Understand that force and motion can be transferred through mechanical devices such as gears, pulleys, levers and springs.	<ul style="list-style-type: none">- Explore falling objects and the effects of air resistance. They should experience forces that make things begin to move, get faster or slow down.- Explore the effects of friction on movement and find out how it slows or stops moving objects, for example by observing the effects of a brake on a bicycle wheel. Pupils should explore the effects of levers, pulleys and simple machines on movement.- Find out how scientists such as Galileo and Isaac Newton helped to develop the theory of gravitation.	<ul style="list-style-type: none">- Explore the effects of air resistance by observing how different objects such as parachutes and sycamore seeds fall.- Work scientifically by: designing and making a variety of parachutes and carrying out fair tests to determine which designs are the most effective.- Explore resistance in water by making and testing boats of different shapes. They might design and make a simple lever and explore its effects.- Explore how pressure can build up and create upthrust – rockets.- Explore elasticity and how much weight an elastic band can hold – Bungee jumper.

Evolution and Inheritance

Objectives	Notes and guidance	Activities/Experiments
<ul style="list-style-type: none">- Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents.- Describe how adaptation leads to evolution.- Recognise how and why the human skeleton has changed over time, since we separated from other primates.	<ul style="list-style-type: none">- Building on what they have learnt about evolution and inheritance in Year 4, look in more detail at how living things evolve.- Introduced the idea that variation in offspring over time can make animals more or less able to survive in particular environments and lead to evolutionary change.- Find out about Charles Darwin's work on evolution. (C/C – Literacy).	<ul style="list-style-type: none">- Work scientifically by: comparing how some living things are adapted to survive in extreme conditions, for example cacti, penguins and camels. They might analyse the advantages and disadvantages of specific adaptations, such as being on two feet rather than four, having a long or a short beak, having gills or lungs, tendrils on climbing plants, brightly coloured and scented flowers.

Magnetism

Objectives	Notes and guidance	Activities/Experiments
<ul style="list-style-type: none">- Describe magnets as having two poles.- Predict whether two magnets will attract or repel each other, depending on which poles are facing.	<ul style="list-style-type: none">- Introduced to a predictive model for the way magnets behave. They should explore the behaviour and every day uses of different magnets (for example, bar, ring, button and horseshoe) and find out about how the Earth acts as a magnet.	<ul style="list-style-type: none">- Work scientifically by: looking for patterns in the way that magnets behave in relation to each other and what might affect this, such as the strength of the magnet or which pole faces another; identifying how these properties make magnets useful in everyday items and suggesting creative uses for different magnets.

		<ul style="list-style-type: none"> - Explore what happens if magnets are hung from threads or floated on water and relate this to the development and use of compasses for navigation.
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Electricity

Objectives	Notes and guidance	Activities/Experiments
<ul style="list-style-type: none"> - Identify and name the basic parts of a simple electrical circuit, including cells, wires, bulbs, switches and buzzers. - Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit. - Compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches. 	<ul style="list-style-type: none"> - Building on their work in Year 3, construct simple series circuits, trying different components, such as switches, bulbs, buzzers and motors. - Learn how to represent a simple circuit in a diagram using recognised symbols. - Pupils should be taught to take the necessary precautions for working safely with electricity. <p>Note: Pupils are expected to learn only about series circuits, not parallel circuits.</p>	<ul style="list-style-type: none"> - Work scientifically by: systematically identifying the effect of changing one component at a time in a circuit; designing and making a set of traffic lights, a burglar alarm or some other useful circuit.