Skills Progression of Science Year 4 - Cornerstones

EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Introduce: • Similarities and differences in relation to places, objects, materials and living things. • Discuss the features of their own immediate environment and how it might vary from others. • Make observations of animals and plants and explain why some things occur, and talk about changes. • Know the importance for good health of physical exercise, and a healthy diet, and talk about ways to keep healthy and safe.	**Introduce:** • Everyday materials – types and comparison • Seasonal changes – across 4 seasons • Animals inc humans – 5 animal groups (mammal etc) • Plants – basic structure (stem, leaf, root, flower)	**Recap:** • Animals inc humans – 5 groups • Everyday materials - types • Plants – basic structure • Seasonal changes	**Recap:** • Plants – seeds and bulbs grow healthy, what is needed • Animals inc humans – exercise and hygiene	**Recap:** • Animals including humans – skeleton types and muscles • Rocks and soils – types and formation	**Recap:** • Living things – grouping and classification; • Forces and Magnets – push and pull; magnetic poles; magnetic materials	**Recap:** • Animals inc humans – digestive system; life cycle • Light - shadow formation and changes • Electricity – simple series; switches
		Introduce: • Living things – alive/ not alive, suited to habitats • Plants – seeds and bulbs grow healthy, what is needed • Animals inc humans – exercise and hygiene • Materials – everyday uses suitability; bend, twist, stretch, squash	**Introduce:** • Rocks and soils – types and formation • Forces and Magnets – push and pull; magnetic poles; magnetic materials • Light and shadows – shadow formation and changes • Animals inc humans – skeleton and muscles • Plants – structure functions, flower structure	**Introduce:** • States of matter – changing state of solid, liquid, gas; water cycle • Electricity – simple series circuits; switches; conductors and insulators • Sound – vibrations; pitch; volume; distance • Living things – grouping and classification; changing environments • Animals inc humans – digestive system	**Introduce:** • Earth and space – orbit of Earth to sun; orbit of Moon; Earth's rotation • Materials – reversible and irreversible changes; dissolving; separation • Living things – life cycle and reproduction • Animals inc humans – changes in human development • Forces – gravity; resistance; mechanisms	**Introduce:** • Evolution and inheritance – adaptation; change over time; offspring • Light – straight lines; seeing things • Electricity – symbols; brightness/ volume changes • Living things – classification of plant/ animal kingdoms • Animals inc humans – circulatory system; diet, nutrients and exercise

Purposes for science:

It provides the foundations for understanding the world through the specific disciplines of biology, chemistry and physics. Science has changed our lives and is vital to the world's future prosperity. All children should be taught essential aspects of the knowledge, methods, processes and uses of science. Through building up a body of key foundational knowledge and concepts, children should be encouraged to recognise the power of rational explanation and develop a sense of excitement and curiosity about natural phenomena. They should be encouraged to understand how science can be used to explain what is occurring, predict how things will behave, and analyse causes.

We use Cornerstones as our planning base and science is taught within the topic if purposeful links can be made. If none are made, science is taught as a discrete subject.

Year 4

Term 1
Food and the digestive system

Objective (NC PoS)	Skill	Vocabulary	Key Scientists
- Describe the simple functions of the basic parts of the digestive system in humans **- Identify the different types of teeth in humans and their simple functions** **- Construct and interpret a variety of food chains, identifying producers, predators and prey** • Ask relevant questions and using different types of scientific enquiries to answer them. • Construct and interpret a variety of food chains, identifying producers, predators and prey. • Describe the simple functions of the basic parts of the digestive system in humans. • Gather, record, classify and present data in a variety of ways to help in answering questions. • Identify differences, similarities or changes related to simple scientific ideas and processes. • Identify the different types of teeth in humans and their simple functions. • Make systematic and careful observations and, where appropriate, take accurate measurements using standard units, using a range of equipment, including thermometers and data loggers. • Recognise that environments can change and that this can sometimes pose dangers to living things. • Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables. • Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions. • Set up simple practical enquiries, comparative and fair tests. • Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions. • Use straightforward scientific evidence to answer questions or to support their findings. • Are equipped with the scientific knowledge required to understand the uses and implications of science, today and for the future.	• Ask relevant scientific questions, independently, about the world around them and begin to identify how they can answer them. • Begin to choose which observations to make and for how long and make systematic, careful observations and comparisons, identifying changes and connections. • Begin to independently plan, set up and carry out a range of comparative and fair tests, making predictions and following a method accurately. • Construct and interpret a variety of food chains and webs to show interdependence and how energy is passed on over time. • Describe the purpose of the digestive system, its main parts and each of their functions. • Describe what damages teeth and how to look after them. • Explain how unfamiliar habitats, such as a mountain or ocean, can change over time and what influences these changes. • Gather, record, classify and present observations and measurements in a variety of ways (pictorial representations, timelines, diagrams, keys, tables, charts and graphs). • Identify the four different types of teeth in humans and other animals, and describe their functions. • Take accurate measurements in standard units, using a range of equipment. • Use scientific vocabulary to report and answer questions about their findings based on evidence collected, draw simple conclusions and identify next steps, improvements and further questions.	• <u>Digestive system:</u> **digest**, digestion, tongue, teeth, saliva, salivary glands, **oesophagus, stomach,** liver, pancreas, gall bladder, **small intestine,** duodenum, **large intestine, rectum,** anus, faeces, organ. • <u>Types of teeth and dental care:</u> **molar**, **premolar**, **incisor**, **canine**, wisdom teeth, tooth decay, plaque, enamel, baby (milk) teeth. • <u>Food chains and animal diets:</u> decomposer, food web. Previously introduced vocabulary: **producer,** consumer, **prey, predator,** excretion, habitat.	**Al-Jahiz (9th Century)** – Provided one of the earliest descriptions of food webs. He was working in Baghdad, Iraq, in the early 800s. **Charles Elton (1900 – 1991)** – Initiated the study of animal ecology

Knowledge (specific knowledge)

- Questions can help us find out about the world and can be answered using scientific enquiry. Observations can be made regularly to identify changes over time.
- Scientific enquiries can be set up and carried out by following or planning a method. A prediction is a statement about what might happen in an investigation, based on some prior knowledge or understanding.
- A fair test is one in which only one variable is changed and all others remain constant.
- All the different food chains in a specific ecosystem can be linked together. These connected food chains are called a food web. Food chains start with a plant (producer), show what animals eat within a habitat and how energy is passed on over time. A producer is a living thing that makes its own food for energy. Almost all producers are plants. Producers make their own food through the process of photosynthesis. Grass and seaweed are examples of producers. A consumer is a living thing that feeds on other living things. Most consumers are animals. Wolves and penguins are examples of consumers. A predator is a consumer that hunts, kills and eats other animals for food. An animal is called prey if it is killed by a predator for food. An ecosystem is a community of living organisms and their environments that are interdependent. Ecosystems have biotic, or living, features including plants, animals and microorganisms. They also have abiotic, or non-living, features including sunlight, water, air, soil and temperature.
- The digestive system is responsible for digesting food and absorbing nutrients and water. The mouth, oesophagus, small intestine and large intestine are organs of the digestive system. Regular teeth brushing, limiting sugary foods and visiting the dentist are important for good oral hygiene. A baby grows 20 primary teeth that start to fall out when a child is six years old. They are replaced by 32 adult teeth. The four different types of teeth are incisors, canines, premolars and molars. Incisors have sharp, straight edges for slicing and cutting food. Canines are pointed for gripping and tearing chewy food such as meat. Pre-molars and molars are wide and have cusps, for crushing and grinding up food so it is small enough to swallow.
- Habitats change over time, either due to natural or human influences.
- All living things depend on the biotic and abiotic features of their ecosystems to survive; therefore, any change to one part will affect all the other parts.
- A conclusion is the answer to a question that uses the evidence collected.

Term 2
Sound

- Identify how sounds are made, associating some of them with something vibrating **- Recognise that vibrations from sounds travel through a medium to the ear** **- Find patterns between the pitch of a sound and features of the object that produced it** **- Find patterns between the volume of a sound and the strength of the vibrations that produced it** **- Recognise that sounds get fainter as the distance from the sound source increases.** • Ask relevant questions and using different types of scientific enquiries to answer them. • Find patterns between the pitch of a sound and features of the object that produced it. • Find patterns between the volume of a sound and the strength of the vibrations that produced it. • Gather, record, classify and present data in a variety of ways to help in answering questions. • Identify differences, similarities or changes related to simple scientific ideas and processes. • Identify how sounds are made, associating some of them with something vibrating. • Make systematic and careful observations and, where appropriate, take accurate measurements using standard units, using a range of equipment, including thermometers and data loggers. • Recognise that sounds get fainter as the distance from the sound source increases. • Recognise that vibrations from sounds travel through a medium to the ear. • Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables. • Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions. • Set up simple practical enquiries, comparative and fair tests. • Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions. • Use straightforward scientific evidence to answer questions or to support their findings.	• Ask relevant scientific questions, independently, about the world around them and begin to identify how they can answer them. • Begin to independently plan, set up and carry out a range of comparative and fair tests, making predictions and following a method accurately. • Compare and find patterns in the pitch of a sound, using a range of equipment, such as musical instruments. • Compare and find patterns in the volume of a sound, using a range of equipment, such as musical instruments. • Compare how the volume of a sound changes at different distances from the source. • Explain how sounds are made and heard using diagrams, models, written methods or verbally. • Gather, record, classify and present observations and measurements in a variety of ways (pictorial representations, timelines, diagrams, keys, tables, charts and graphs). • Use scientific vocabulary to report and answer questions about their findings based on evidence collected, draw simple conclusions and identify next steps, improvements and further questions.	• Parts of the **ear**: **eardrum.** • Making sound: **vibration,** vocal cords, **particles.** • Measuring sound: **pitch**, **volume, amplitude, sound wave,** quiet, loud, high, low, travel, **distance.** • Other: **soundproof, absorb sound.**	**Robert Boyle (1627- 1691)** **Ernst Mach (1838-1916).** Described how shock waves are formed. **Heinrich Hertz (1857-94).** The unit of frequency used for all kinds of waves and vibrations is named after him. One Hertz is equal to one vibration per second.

Knowledge (specific knowledge)

- Questions can help us find out about the world and can be answered using scientific enquiry. Scientific enquiries can be set up and carried out by following or planning a method. A prediction is a statement about what might happen in an investigation, based on some prior knowledge or understanding. A fair test is one in which only one variable is changed and all others remain constant.
- Pitch is how high or low a sound is. Generally, the longer, looser, bigger and thicker the sound source is the lower the pitch. Generally, the shorter, tighter, smaller and thinner the sound source is the higher the pitch.
- Sounds are louder when more energy is put into a sound source because the vibrations and sound waves are larger. The volume of sound is measured in decibels (dB). Sound waves travel through a medium, such as air or water, to the ear. A sound source is something that vibrates and creates a sound, such as human vocal cords, part of a musical instrument or a piece of machinery. Volume is a measure, in decibels, how loud or quiet sound is. Applying more force to a sound source adds more energy and results in a louder sound. Pitch is how high or low a sound is.
- Distant and direction of sound can be judged. When energy is put into a sound source it starts to vibrate. These vibrations disturb tiny particles of air. They vibrate and collide with each other, creating sound waves. When the sound waves enter the ear, the eardrum vibrates. These vibrations pass through small bones, called ossicles, and are turned into electrical signals in the cochlea. They travel to the brain and are interpreted as sounds. A sound wave diagram can be drawn as a wavy line with peaks and troughs. The distance between two peaks or troughs is called a wavelength. The shorter the wavelength the higher the pitch of a sound. The longer the wavelength the lower the pitch of the sound. The smaller the peaks and troughs the quieter the sound. The larger the peaks and troughs the louder the sound.
- A conclusion is the answer to a question that uses the evidence collected.

Term 3

States of matter

- Explore a variety of everyday materials and develop simple descriptions of the states of matter
- Compare and group materials together, according to whether they are solids, liquids or gases
- Observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C)
- Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.

- Gather, record, classify and present data in a variety of ways to help in answering questions.
- Identify differences, similarities or changes related to simple scientific ideas and processes.
- Make systematic and careful observations and, where appropriate, take accurate measurements using standard units, using a range of equipment, including thermometers and data loggers.
- Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables.
- Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.
- Set up simple practical enquiries, comparative and fair tests.
- Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions.
- Use straightforward scientific evidence to answer questions or to support their findings.

- Begin to choose which observations to make and for how long and make systematic, careful observations and comparisons, identifying changes and connections.
- Begin to independently plan, set up and carry out a range of comparative and fair tests, making predictions and following a method accurately.
- Gather, record, classify and present observations and measurements in a variety of ways (pictorial representations, timelines, diagrams, keys, tables, charts and graphs).
- Data can be recorded and displayed in different ways, including tables, charts, graphs, keys and labelled diagrams.
- Group and sort materials into solids, liquids or gases.
- Observe and explain that some materials change state when they are heated or cooled and measure or research the temperature in degrees Celsius (°C) at which materials change state.
- Take accurate measurements in standard units, using a range of equipment.
- Use scientific vocabulary to report and answer questions about their findings based on evidence collected, draw simple conclusions and identify next steps, improvements and further questions.

- **States of matter: solids, liquids, gases,** particles.
- State change: **evaporate, condense, melt, freeze,** heat, cool, melting point, freezing point, boiling point, **water vapour**.
- Water cycle: **precipitation**, evaporation, condensation, ground run-off, collection, underground water, bodies of water (sea, river, stream), water droplets, hail.
- Other: atmosphere.

Previously introduced vocabulary: temperature, rain, cloud, snow, wind, sun, hot, cold, absorb, carbon dioxide.

Alfred Barnhard Nobel (1833-1896) - http://www.nobelprize.org/alfred_nobel/

Royal Society of Chemistry – 'The 175 Faces of Chemistry' provides information on contemporary chemists and chemists of the past - http://www.rsc.org/diversity/175-faces/all-faces

Knowledge (specific knowledge)

- An observation involves looking closely at objects, materials and living things. Observations can be made regularly to identify changes over time.
- Scientific enquiries can be set up and carried out by following or planning a method. A prediction is a statement about what might happen in an investigation, based on some prior knowledge or understanding. A fair test is one in which only one variable is changed and all others remain constant.

Factors that affect the rate of ice melting include the size of the ice, the temperature, agitation by stirring and changing its composition.
A line graph is a way of displaying data that shows a relationship between two variables. Many line graphs show changes over time. A flat line means that there was no change over time. A line with a shallow curve means there was a gradual change over time. A line with a steep curve means there was a quick change over time.

- Materials can be grouped according to whether they are solids, liquids or gases. Solids stay in one place and can be held. Some solids can be squashed, bent, twisted and stretched. Examples of solids include wood, metal, plastic and clay. Liquids move around (flow) easily and are difficult to hold. Liquids take the shape of the container in which they are held. Examples of liquids include water, juice and milk. Gases spread out to fill the available space and cannot be held. Examples of gases include oxygen, helium and carbon dioxide. Air is a mixture of gases.
- Heating or cooling materials can bring about a change of state. This change of state can be reversible or irreversible. The temperature at which materials change state varies depending on the material. Water changes state from solid (ice) ⇌ liquid (water) at 0°C and from liquid (water) ⇌ gas (water vapour) at 100°C. The process of changing from a solid to liquid is called melting. The reverse process of changing from a liquid to a solid is called freezing. The process of changing from a liquid to a gas is called evaporation. The reverse process of changing from a gas to a liquid is called condensation.

The temperature when a solid begins to melt is called its melting point. The temperature when a liquid begins to freeze is called its freezing point. The temperature when a liquid begins to evaporate is called its boiling point. The temperature when a gas begins to condense is called its condensing point.
Temperature is a measure of how hot or cold something is. It is measured in degrees using an instrument called a thermometer. In the United Kingdom, temperature is measured in degrees Celsius.
Different materials have different melting and boiling points. A material's state on Earth depends on Earth's temperature.

- Equipment is used to take measurements in standard units. Examples include data loggers plus sensors, timers (seconds, minutes and hours), thermometers (°C), and metre sticks, rulers or trundle wheels (millimetres, centimetres, metres).
- Results are information, such as data or observations, that have been found out from an investigation. A conclusion is the answer to a question that uses the evidence collected.

Particles make up all materials. The particles are close together and arranged in a regular pattern in a solid. In a liquid, the particles are close together but arranged randomly. In a gas, the particles are randomly arranged and far apart.

Term 4
Grouping and classifying

- Recognise that living things can be grouped in a variety of ways
- Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment
- Recognise that environments can change and that this can sometimes pose dangers to living things.

- Ask relevant questions and using different types of scientific enquiries to answer them.
- Gather, record, classify and present data in a variety of ways to help in answering questions.
- Identify differences, similarities or changes related to simple scientific ideas and processes.
- Make systematic and careful observations and, where appropriate, take accurate measurements using standard units, using a range of equipment, including thermometers and data loggers.
- Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables.
- Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.
- Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions.
- Use straightforward scientific evidence to answer questions or to support their findings.

- Ask relevant scientific questions, independently, about the world around them and begin to identify how they can answer them.
- Begin to choose which observations to make and for how long and make systematic, careful observations and comparisons, identifying changes and connections.
- Compare, sort and group living things from a range of environments, in a variety of ways, based on observable features and behaviour.
- Gather, record, classify and present observations and measurements in a variety of ways (pictorial representations, timelines, diagrams, keys, tables, charts and graphs).
- Use scientific vocabulary to report and answer questions about their findings based on evidence collected, draw simple conclusions and identify next steps, improvements and further questions.

- Living things: **organisms, specimen,** species.
- Grouping living things: **classification,** classification keys, classify, **characteristics**.
- Names of invertebrate animals: snails and slugs, worms, spiders, insects.
- Invertebrate body parts: e.g. wing case, abdomen, thorax, antenna, segments, mandible, proboscis, prolegs.
- Environmental changes: **environment,** environmental dangers, adapt, natural changes, climate change, deforestation, pollution, urbanisation, invasive species, **endangered species, extinct.**

Carl Linnaeus (1707 – 1778) – Developed a method for classifying all living things on the planet.
http://www.nhm.ac.uk/nature-online/science-of-natural-history/biographies/linnaeus/

Previously introduced vocabulary: carbon dioxide, **fish, bird, mammal, amphibian, reptile**, skeleton, bone, **vertebrate, invertebrate,** backbone, names for animal body parts, names of common plants, photosynthesis.

Knowledge (specific knowledge)

- Questions can help us find out about the world and can be answered using scientific enquiry.
- An observation involves looking closely at objects, materials and living things. Observations can be made regularly to identify changes over time.

Classification is the arrangement of living and non-living things into groups or categories. Single-stage classification involves separating a large group of objects into smaller groups based on a single property. Multi-stage classification involves sorting groups into subgroups repeatedly until all the objects in one group are the same. Serial ordering involves sorting objects into an order based on a property.

- Scientists classify living things according to shared characteristics. Animals can be divided into six main groups: mammals, reptiles, amphibians, birds, fish and invertebrates. These groups can be further subdivided. Classification keys are scientific tools that aid the identification of living things.

The animal kingdom is divided into vertebrates and invertebrates. A vertebrate is an animal with a backbone. An invertebrate is an animal without a backbone. All vertebrates are covered with skin, feathers, scales, fur or hair. Invertebrates usually have soft bodies or a hard outer shell or covering called an exoskeleton.
Invertebrates usually have soft bodies or a hard outer shell or covering called an exoskeleton. There are six main groups of invertebrates: annelids, molluscs, arachnids, crustaceans, insects and myriapods.
The plant kingdom is divided into vascular and non-vascular plants. There are two main types of vascular plants: plants with seeds and plants with spores. There are two groups of plants with seeds: flowering plants and cone-bearing plants.

- Data can be recorded and displayed in different ways, including tables, charts, graphs, keys and labelled diagrams.

Classification keys are created by devising a set of yes or no questions that separate a group into two groups until objects end up on their own. Classification keys are also called dichotomous keys or branching trees.

- Results are information, such as data or observations, that have been found out from an investigation. A conclusion is the answer to a question that uses the evidence collected.

All vertebrates are covered with skin, feathers, scales, fur or hair. They give birth to live young or lay eggs. They can be cold blooded or warm blooded.

Term 5 and 6

Electrical circuits and conductors

- Identify common appliances that run on electricity
- Construct a simple series circuit, identifying/naming its basic parts, including cell, wire, bulb, switch and buzzer
- Use their circuits to create simple devices
- Draw the circuit as a pictorial representation (not necessarily using conventional circuit symbols)
- Identify whether or not a lamp will light in a simple series circuit
- Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit
- Recognise some common conductors and insulators, and associate metals with being good conductors.

- Ask relevant questions and using different types of scientific enquiries to answer them.
- Gather, record, classify and present data in a variety of ways to help in answering questions.
- Identify differences, similarities or changes related to simple scientific ideas and processes.
- Make systematic and careful observations and, where appropriate, take accurate measurements using standard units, using a range of equipment, including thermometers and data loggers.
- Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables.
- Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.
- Set up simple practical enquiries, comparative and fair tests.
- Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions.
- Use straightforward scientific evidence to answer questions or to support their findings.

Develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics.

- Ask relevant scientific questions, independently, about the world around them and begin to identify how they can answer them.
- Begin to choose which observations to make and for how long and make systematic, careful observations and comparisons, identifying changes and connections.
- Begin to independently plan, set up and carry out a range of comparative and fair tests, making predictions and following a method accurately.
- Compare common household equipment and appliances that are and are not powered by electricity.
- Construct operational simple series circuits using a range of components and switches for control.
- Describe materials as electrical conductors or insulators.
- Explain the precautions needed for working safely with electrical circuits.
- Gather, record, classify and present observations and measurements in a variety of ways (pictorial representations, timelines, diagrams, keys, tables, charts and graphs).
- Predict and describe whether a circuit will work based on whether or not the circuit is a complete loop and has a battery or cell.
- Incorporate circuits that use a variety of components into models or products.
- Write a program to control a physical device, such as a light, speaker or buzzer.
- Choose from a range of materials, showing an understanding of their different characteristics.
- Describe how natural resources can be harnessed to create sustainable energy.

- <u>Electricity:</u> mains-powered, battery-powered, **mains electricity,** plug, **appliances**, devices.
- <u>Circuits:</u> **circuit,** simple series circuit, complete circuit, incomplete circuit.
- <u>Circuit parts:</u> bulb, cell, wire, buzzer, switch, motor, **battery.**
- <u>Materials:</u> **electrical conductor, electrical insulator.**
- <u>Other:</u> safety.

Previously introduced vocabulary: names of materials.

Charles Augustine Coulomb (1736-1806). He invented instruments for measuring the forces between magnets and between charges. The unit for measuring an amount, or charge, of electricity is named after him. One coulomb (symbol C) is the amount of electricity that flows past any point when a current of one amp flows for one second.

Andre-Marie Ampere (1775-1836). His studies allowed people to measure the amount of electric current flowing through a circuit. Thus, the current is measured in units called amperes, or amps for short. One amp is a flow of about 6 million million million electrons per second.

Knowledge (specific knowledge)

- Questions can help us find out about the world and can be answered using scientific enquiry. An observation involves looking closely at objects, materials and living things. Observations can be made regularly to identify changes over time.
- Scientific enquiries can be set up and carried out by following or planning a method. A prediction is a statement about what might happen in an investigation, based on some prior knowledge or understanding. A fair test is one in which only one variable is changed and all others remain constant.
- Electricity is a type of energy. It is used to power many everyday items, such as kettles, computers and televisions. Electricity can also come from batteries. Batteries eventually run out of power and need to be recycled or recharged. Batteries power devices that can be carried around, such as mobile phones and torches.

Electricity is essential to our daily lives and makes peoples' lives easier. Electricity comes from two sources, mains and batteries. A circuit is a collection of components connected by wires through which an electric current can flow. A circuit must be a complete loop to work. A series circuit has a single path for an electric current to flow through.

- Electrical components include cells, wires, lamps, motors, switches and buzzers. Switches open and close a circuit and provide control. Electrical conductors allow electricity to flow through them, whereas insulators do not. Common electrical conductors are metals. Common insulators include wood, glass, plastic and rubber.

Plugs and cabling are made from a combination of conductive and insulating materials. Insulating plastic covers conductive metals to make plugs safe to use.

- Working with electrical circuits can be dangerous. Precautions include not touching electrical components with wet hands and not putting batteries in mouths. A series circuit is a simple loop with only one path for the electricity to flow. A series circuit must be a complete loop to work and have a source of power from a battery or cell. Components can be added to circuits to achieve a particular goal. These include bulbs for lighthouses and torches, buzzers for burglar alarms and electronic games, motors for fairground rides and motorised vehicles and switches for lights and televisions.
- Use scientific vocabulary to report and answer questions about their findings based on evidence collected, draw simple conclusions and identify next steps, improvements and further questions.

A switch makes or breaks a circuit. When a switch is closed or 'on', the circuit is complete. When a switch is open or 'off', the circuit is incomplete.

A nightlight is a small electric light that gives out a dim glow. Design features of nightlights include a switch, light source and an attractive casing.

- Remote control is controlling a machine or activity from a distance. Computers can be used to remotely control a device, such as a light, speaker or buzzer.
- Different materials and components have a range of properties, making them suitable for different tasks. It is important to select the correct material or component for the specific purpose, depending on the design criteria. Recipe ingredients have different tastes and appearances. They look and taste better and are cheaper when in season.
- The environment produces natural resources. Humans use some natural resources to make energy. Some natural resources cannot be replaced, like coal or oil. They are non-renewable. Some, like wind or flowing water, are renewable sources of energy.

The modern world would not function without electricity. Most electricity is produced in power stations by burning fossil fuels. Sustainable, renewable sources of electricity are solar power, wind power, hydroelectric power, geothermal energy and bioenergy.