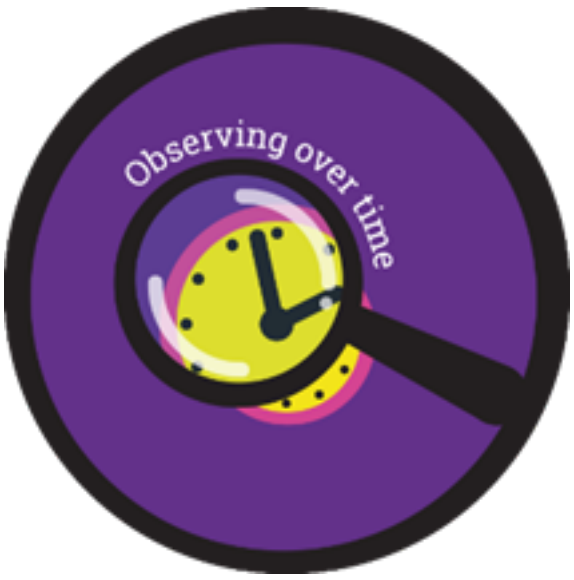
Types of Scientific Enquiry

Crucial Learning

The five ways we apply our Working Scientifically Skills.

Pattern seeking involves identifying patterns and looking for relationships in enquiries.

Research using secondary sources involves using secondary sources of information to answer scientific questions.



Observing over time involves observing changes that occur over a period of time ranging from minutes to months.

Comparative and fair testing involves changing one variable to see its effect on another, whilst keeping all the others the same.

Identifying, classifying and grouping involves making observations to name, sort and organise items.

BIOLOGY

Crucial Learning

Y6

Evolution and inheritance

- Evolution is the process of change that takes place over many generations.
- Adaptation is how living things are specialised to suit their environment.
- Species- a group of living things with similar characteristics.
- Fossils give us evidence of what lived on the Earth millions of year ago.
- Inheritance is when living things reproduce and pass on characteristics to their offspring.

Living things and their habitats

- Micro-organisms are living organisms too small to see with the eye.
- Vertebrates are animals that have a backbone.
- Invertebrates are animals that do not have a backbone.
- Bacteria are microscopic organisms that often play a role in the decay of living things, the process of fermentation, and sometimes in causing disease.
- A virus is a micro-organism that causes an illness.

Living things and their habitats

- Sexual reproduction is when a male and a female reproduce to create an offspring who is similar to the parent.
- Offspring is the young of a person, animal or plant.
- Asexual reproduction requires one parent, and the offspring are identical to the parent.
- Germination is the process by which seeds begin to grow into plants.
- Fertilisation is when the male and female parts meet to form an embryo or seed.

Animals, including humans

- The circulatory system is made of the heart, lungs, blood and the blood vessels.
- The circulatory system is the system responsible for circulating blood through the body, supplying nutrients and oxygen and removing waste products.
- Red blood cells carry oxygen and white blood cells protect against disease.
- Blood platelets help the blood to clot to prevent excessive bleeding.
- Plasma is the liquid that carries the blood cells and the nutrients along the blood vessels.

Y5

Animals, including humans

- Puberty is the stage in someone's life when their body starts to become physically mature.
- Changes during puberty can include growth in height, sweating more, hair growth and growth in parts of the body.
- Reproduction is when an animal or plant produces one or more individuals similar to itself.

Living things and their habitats

- An organism is an individual living thing, such as a plant, an animal or a germ.
- Living things are any organism that possesses or shows the characteristics of life of being alive.
- The seven life processes are: movement, respiration, sensitivity, growth, reproduction, excretion and nutrition.
- A habitat is the natural home or environment of an animal, plant, or other organism.

Y4

Animals, including humans

- Humans have four types of teeth: incisors, canines, premolars and molars.
- The digestive system has 5 main organs: mouth, oesophagus, stomach, small intestine and large intestine.
- A producer is an organism that can make its own food, like a plant.
- A consumer is an organism that eats another organism.
- A predator hunts other animals.
- Prey is eaten by another animal.

Plants

- Many plants have roots, stems/trunks, leaves and flowers.
- Plants need different amounts of water, light, a suitable temperature, air and nutrients from the soil to grow.
- Pollination is the transfer of pollen from the male part of a plant to a female part of a plant to produce seeds.
- Seed dispersal is the way seeds get away from the parent plant to a new place.

Y3

Animals, including humans

- Nutrients are the important substances you get from food that help your body survive and grow.
- The main nutrients are: carbohydrates, protein, fats, minerals, vitamins and water.
- A skeleton provides support to an animal's body and protects important organs.
- Animals with exoskeletons have their skeletons on the outside of their body.
- Animals with endoskeletons have their skeletons on in inside of their body.

CHEMISTRY

Crucial Learning

Consolidation of previous learning

Y6 — Properties and changes of materials

- Dissolve is when a substance is mixed with a liquid and the substance disappears.
- Insoluble means impossible to dissolve and soluble means able to be dissolved.
- Permeable is when a substance allows liquids or gases to pass through it.
- A solution is a mixture that contains two or more substances combined evenly.

Y5 — States of matter

- A particle is a tiny bit of matter that makes up everything in the universe.
- The particles in a solid are tightly packed and can only vibrate.
- The particles in a liquid can move and flow over each other.
- The particles in a gas are spread out and can move in all directions.
- Evaporation is a change of state from liquid to gas.
- Condensation is the change back from a gas to a liquid caused by cooling.
- The stages of the water cycle are evaporation, condensation, precipitation and collection.

Y4 — Rocks and Soil

- Igneous rocks are formed when magma or lava from volcanoes cools.
- Sedimentary rocks are formed when tiny pieces of rocks and animal skeletons are pressed together in rivers and oceans.
- Metamorphic rocks are formed when other rocks are heated and squeezed (pressured).
- Fossils are the remains of prehistoric life and were formed millions of years ago.
- Soil is the top layer of the Earth's crust.
- Soil is made of tiny pieces of rock, dead plants and animals.

Y3

PHYSICS

Crucial Learning

Y6

Electricity

- Electricity is a form of energy which can be generated by gas, coal, oil, wind or the sun (solar).
- Voltage is a measure of how strong the current is in a circuit.
- The current is the flow of electricity through the circuit.

Light

- Light travels in a straight line.
- We see objects when light goes into eyes, which could come directly from the light source or from it being reflected from the object into our eyes.
- Reflect means to send back from the surface and not pass through it.
- Shadows are formed when light from a source is blocked by an opaque object.

Y5

Earth and Space

- The Solar System is a collection of planets that orbit the Sun.
- The Earth spins on its axis as it travels around the Sun, and it rotates once every 24 hours.
- The Moon is a natural satellite in space which orbits the Earth – held by gravity.

Forces - Air resistance

- Air resistance is a type of friction between air and another material.
- Water resistance is the friction that is created between water and an object that is moving through it.
- Gravity is the force that pulls objects to the centre of the Earth.
- Levers, pulleys and gears are examples of mechanisms.

Electricity

- Electricity is a form of energy.
- A simple circuit is a complete loop that has a cell, wires and an appliance.
- A switch opens and closes a circuit and controls the flow of electrical current around a circuit.
- A conductor is a material that will allow electrical current to flow through it.
- An insulator is a material that will not allow the current to pass through it.

Y4

Sound

- A sound produces vibrations which travel from the source to our ears.
- Pitch is how high or low a sound is.
- The volume is the loudness of the sound and it depends on the strength (size) of vibrations.
- Sounds become fainter as you move away from the source.

Forces and Magnets

- A force is a push or a pull.
- Friction is a force between two surfaces which are sliding across each other.
- Repel is when the objects push each other away.
- Attract is when the objects pull together.
- Magnets have two poles – a north pole and a south pole.

Y3

Light

- When light is reflected by a surface, it changes direction and bounces off the surface.
- A shadow is formed when light is blocked by an opaque object.
- An object is opaque when you cannot see through it.
- An object is transparent when you can see through it.
- An object is translucent when it allows some light through it.
- Reflect means to send back from the surface and not pass through it.