



Science progression for Year 3 and 4 at Cusgarne

Subject Lead: Tim Barnard

<p>Lower KS2 Working Scientifically:</p> <ul style="list-style-type: none"> Asks relevant questions and uses past knowledge when considering new investigation Can set up simple practical enquiries and understand a fair test. Can understand that changing only one variable is the best method for testing. Can make careful observations using notes and simple tables and drawing. In drawing can consider scale and detail. Can take accurate measurements using standard units of length, time and heat. Use mm and cm. Use negative numbers. labelled diagrams neatly, use keys, bar charts, and simple tables. Use headings to clarify what information is being collected. Draw simple conclusions, make predictions for new values, suggest improvements and raise further questions Use scientific evidence to answer questions or to support their findings relate the results to scientific knowledge Use independent research including secondary sources to help them to answer questions Know how to use a microscope, magnifying lens, thermometer. 	<p>Plants</p> <ul style="list-style-type: none"> Investigate the way in which water is transported within plants Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. Know that plants make their own food (produce glucose) <p>Animals including Humans</p> <ul style="list-style-type: none"> Identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat Identify that humans and some animals have skeletons and muscles for support, protection and movement. 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. Incisors, molars, canines Construct and interpret a variety of food chains, identifying producers, predators and prey. <p>Rocks</p> <ul style="list-style-type: none"> Compare and group together different kinds of rocks (including those in the locality) on the basis of appearance and simple physical properties. Sedimentary and Igneous Describe in simple terms how fossils are formed when things that have lived are trapped within rock Recognise that soils are made from rocks and organic matter <p>Light</p> <ul style="list-style-type: none"> Recognise that they need light in order to see things and that dark is the absence of light Notice that light is reflected from surfaces Recognise that light from the sun can be dangerous and that there are ways to protect their eyes Recognise that shadows are formed when the light from a light source is blocked by a solid object Find patterns in the way that the size of shadows change. Know the term translucent, opaque and transparent <p>Forces and Magnets</p> <ul style="list-style-type: none"> Compare how things move on different surfaces and understand friction Notice that some forces need contact between two objects, but magnetic forces can act at a distance Observe how magnets attract or repel each other and attract some materials and not others Identify some magnetic materials Describe magnets as having two poles

Living things and their Habitats

- 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.
- Know the groups **Vertebrates Amphibians, reptiles, birds, fish and mammals. Invertebrates insects, molluscs and arachnids**

States of Matter

- Compare and group materials together, according to whether they are **solids, liquids or gases** including states of water
- 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.

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**
- **Pitch, and Volume**

Electricity

- Identify **common appliances** that run on electricity
- Construct a simple series circuit, identifying/naming its basic parts, including **cell, wire, bulb, switch and buzzer**
- Draw the circuit as a pictorial representation including **lamp and buzzer**
- **Precautions for working safely with electricity.**
- Recognise that a **switch** opens and closes a circuit Recognise some **common conductors and insulators**, and associate metals with being good conductors.

Science progression for Year 5 and 6 at Cusgarne

National Curriculum objectives: In this unit, children will be taught to:

Year 5 and 6 Working Scientifically

- Independently change a variable and restrict the exploration to test particularly elements
- Independently take measurements, using a range of scientific equipment, (thermometers, pedometers, stop watches, force meters) with increasing accuracy and precision and take repeat readings when appropriate
- Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, graphs, bar and line graphs. Think sensibly about the scales to use.
- Make predictions that relate to past learning and give reasons for their predictions
- Discuss if they feel they have achieved a valid result
- Identifying scientific evidence that has been used to support or refute ideas or arguments in relation to the origin of man
- Explore systematically and logically to reach a conclusion
- Recognise that scientific ideas change and develop over time for example the knowledge of our solar system
- Draw conclusions based on their data and observations, use evidence to justify their ideas, and use their scientific knowledge and understanding to explain their findings.
- Pupils should read, use, spell and pronounce scientific vocabulary correctly, unless a specific education need has been identified.

Living things and their Habitats, Animals including humans

Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird

Describe the life process of reproduction in some plants and animals.

Follow the RSE documents to explore the human reproductive cycle and how humans change with age.

Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals

Find out about significance of the work of scientists such as Carl Linnaeus, a pioneer of classification.

Animals, including Humans

Identify and name the main parts of **the human circulatory system such as arteries and veins**, and describe the **functions of the heart, blood vessels and blood**.

Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function linked to PSHE

Understand the ways in which nutrients and water are transported within animals, including humans.

Properties and changes of materials

Compare and group together everyday materials on the basis of their properties, including their hardness,

solubility, transparency, conductivity (electrical and thermal), and response to magnets

Know that some materials will dissolve in liquid to form a **solution**, and describe how to recover a substance from a solution

Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through **filtering, sieving and evaporating. Understand reversible and irreversible changes**

Know that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda.

Evolution and Inheritance

Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago and understand that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents.

Identify how animals and plants are adapted to suit their environment in different ways and that **adaptation** may lead to evolution. Explore the work of Charles Darwin and Mary Anning. Know the terms **extinction, genes, variation**.

Earth and Space

Know the movement of the Earth, and other planets, relative to the Sun in the solar system and how the moon moves in relation to the Earth

Understand the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.

Learn that the Sun is a star at the centre of our **solar system** and that it has eight planets: **Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune** (Pluto was reclassified as a 'dwarf planet' in 2006).

Understand that a moon is a **celestial body that orbits** a planet (Earth has one moon; Jupiter has four large moons and numerous smaller ones).

Learn about man's investigations into our solar system and life on the space station

Forces

Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object

Identify the effects of **air resistance, water resistance and friction** that act between moving surfaces

Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.

Light

Know that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye

Use mirrors to reflect and alter the direction of light. **Concave and convex.**

Split light to see the visual spectrum

Understand the moon is reflecting light from the sun

Electricity

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

Design and draw circuits using correct symbols when representing a simple circuit in a diagram.