Science Programme of Study

Last updated: Sonia Fletcher, 2023

Somerdale Educate Together uses Hamilton to guide sequences of learning in Key Stage One and Key Stage Two.

Curriculum Content for EYFS, Key Stage 1 and Key Stage 2

PRE-SCHOOL
• Use all their senses in hands-on exploration of natural materials. • Talk about what they see, using a wide vocabulary. • Explore collections of materials with similar and/or different properties. • Explore how things work. • Plant seeds and care for growing plants. • Understand the key features of the life cycle of a plant and an animal. • Explore and talk about different forces they can feel. • Talk about the differences between materials and changes they notice.
RECEPTION
• Explore the natural world around them. • Describe what they see, hear and feel whilst outside. • Recognise some environments that are different from the one in which they live. • Understand the effect of changing seasons on the natural world around them.

YEAR ONE			
Working Scientifically Skills • Children ask simple questions and recognise that they can be answered in different ways observing closely, using simple equipment. • Children to perform simple tests. • Children identify and classify. • Children use their observations and ideas to suggest answers to questions. • Children gather and record data to help in answer questions.			
Plants	Animals, including humans	Everyday Materials	Seasonal Changes
Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees found in the local area. Identify and describe the basic structure of a variety of common flowering plants, including trees.	Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals. Identify and name a variety of common animals that are carnivores, herbivores and omnivores describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets). Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.	Distinguish between an object and the material from which it is made. Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock. Describe the simple physical properties of a variety of everyday materials. Compare and group together a variety of everyday materials based on their simple physical properties.	Observe changes across the four seasons. Observe and describe weather associated with the seasons and how day length varies.
Key Vocabulary			
Deciduous, evergreen Leaves, flowers/blossom, petals, fruit, roots, bulb, seed, trunk, branches, stem.	Head, neck, arms, elbows, legs, knees, face, ears, eyes, hair, mouth, teeth, fish, amphibians, reptiles, birds and mammals, wings, beak, carnivores, herbivores omnivores, texture, taste, touch, see sound, smell, senses.	Hard, soft, bendy, rough, smooth, materials, properties, brick, paper, fabrics, wood, plastic, glass, paper, metal, rock.	Seasons, Autumn, Winter, Spring, Summer, weather, climate, sun, day, moon, night, light, dark.

<table>
<tr><th colspan="4">YEAR TWO</th></tr>
<tr><td colspan="4">Working Scientifically Skills
Children ask simple questions and recognise that they can be answered in different ways observing closely, using simple equipment.
Children perform simple tests.
Children identify and classify.
Children use their observations and ideas to suggest answers to questions.
Children gather and record data to help in answering questions.</td></tr>
<tr><td>Plants</td><td>Animals, including humans</td><td>Uses of Everyday Materials</td><td>Living Things and their Habitats</td></tr>
<tr><td>Observe and describe how seeds and bulbs grow into mature plants.

Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.</td><td>Notice that animals, including humans, have offspring which grow into adults.

Find out about and describe the basic needs of animals, including humans, for survival (water, food and air).

Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.</td><td>Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses.

Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.</td><td>Explore and compare the differences between things that are living, dead, and things that have never been alive.

Identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other.

Identify and name a variety of plants and animals in their habitats, including micro-habitats.

Describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food.</td></tr>
<tr><th colspan="4">Key Vocabulary</th></tr>
<tr><td>Germination, growth and survival, reproduction, seeds, bulb, water, light, temperature.</td><td>Offspring, reproduction, life cycle, survival, exercise, nutrition, hygiene, baby, toddler, child, teenager, adult, healthy, water, air, food.</td><td>Hard/soft; stretchy/stiff; shiny/dull; rough/smooth; bendy/not bendy; waterproof/not waterproof; absorbent/not absorbent; squashing, opaque, transparent, twisting and stretching, wood, metal, plastic, glass, brick, rock, paper, elastic, foil.</td><td>Living, dead, habitat, micro-habitat, food chain, alive, dead, energy, human, predator, prey, woodland, pond, desert.</td></tr>
</table>

YEAR THREE				
Working Scientifically Skills • Children ask their own questions about what they observe and make decisions through predictions and hypotheses about which types of scientific enquiry are likely to be the best to answer their questions. • Children must talk first using scientific language and write later. • Children's scientific view of the world is broadened through exploring, talking about, testing and developing ideas about everyday phenomena. • Children gather, record, classify and present data in a variety of ways. • Children record and report findings in drawings, explanations, labelled diagrams, keys, bar charts and tables. • Children observe changes over time, noticing patterns, grouping and classifying things and carrying out simple comparative and fair tests. • Children set up practical enquiries. • Children continually use scientific vocabulary when working scientifically and around the curriculum.				
Y3 Plants Biology	Y3 Animals, including humans Biology	Y3 Rocks Chemistry	Y3 Light Physics	Y3 Forces and magnets Physics
Explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant. Investigate the way in which water is transported within plants. Explore the life cycle of flowering plants including pollination and seed dispersal.	Identify that animals, including humans, need the right types and amount of nutrition and that they cannot make their own food and get nutrition from what they eat. Identify that humans and other animals have skeletons and muscles for support, protection and movement.	Compare and group different types of rocks using simple physical properties. Describe simply how fossils are formed Recognise that soil is made from rocks and organic matter.	Recognise that they need light to see things and that dark is the absence of light. Notice that light is reflected from surfaces. Recognise that light from the sun is dangerous and the need for protection from an opaque material. Recognise how shadows are formed and find patterns in the way that shadows change.	Compare how things move on different surfaces and how forces need contact between two objects, but magnetic force can act at a distance. Observe and predict how magnets attract or repel and attract some materials. Compare and group everyday materials on the basis of magnetism.
Key Vocabulary				
Flower, roots, stem, trunk, leaves, flowers, nutrition, support, reproduction, growth, air, light, water, fertiliser, soil, pollination, formation, dispersal, transportation.	Vitamins, minerals, fat, protein, carbohydrates, fibre, water, skeletons, skull, bones, heart, lungs, joints, muscles, nutrition, movement.	Force, push, pull, magnetic, attract, repel, friction, poles.	Light, dark, reflect, natural, translucent, transparent, opaque, shadows, mirror, reflective.	Rock, stone, fossil, chalk, granite, crystals, marble, sandstone, slate.

YEAR FOUR				
Working Scientifically Skills • Children ask their own questions about what they observe and make decisions through predictions and hypotheses about which types of scientific enquiry are likely to be the best to answer their questions. • Children must talk first using scientific language and write later. • Children's scientific view of the world is broadened through exploring, talking about, testing and developing ideas about everyday phenomena. • Children gather, record, classify and present data in a variety of ways. • Children record and report findings in drawings, explanations, labelled diagrams, keys, bar charts and tables. • Children observe changes over time, noticing patterns, grouping and classifying things and carrying out simple comparative and fair tests. • Children set up practical enquiries. • Children continually use scientific vocabulary when working scientifically and around the curriculum.				
Y4 Living things and their habitats Biology	Y4 Animals including humans Biology	Y4 Sound Physics	Y4 Electricity Physics	Y4 States of matter Chemistry
Recognise that living things can be grouped in a variety of ways. Explore and use keys to help group, identify and name living things. Recognise that environments can change and that this can sometimes pose dangers to living things.	Describe simple functions and parts of the digestive system in humans. Identify different types of teeth and their simple functions in humans. Construct and interpret a variety of food chains.	Identify how sounds are made. Recognise that vibrations from sounds travel through a medium to the ear. Find patterns between the pitch of a sound and the features of the object that produced it. Find patterns between the volume of a sound and the strength of the vibration that produced it. Recognise that sounds get fainter as the distance from the sound sources increases.	Identify common appliances that run on electricity and construct simple series electrical circuits that includes switches and buzzers. Identify whether or not a lamp will light in a simple series circuit. Recognise the function of a switch in a simple series circuit. Recognise common materials as good conductors and insulators.	Compare and group materials linked solids, liquids and gases. Observe that materials change state when they are heated and cooled using measure and research skills. Explore and identify key elements of the water cycle including evaporation and condensation and associate the rate of evaporation with temperature.
Key Vocabulary				
Carnivore, herbivore, omnivore, vertebrates, invertebrates, insects, fish, amphibians, retiles, birds, mammals, environment, habitats.	Digestive system, mouth, tongue, teeth, incisors, canines, molars, oesophagus, stomach, acid, enzymes, small intestine, large intestine, producer, prey, predator, energy.	Pitch, tune, high, low, volume, loud, quiet, wave, wires, travel, vibration.	Appliances, electricity, electrical, circuit, cell, wire, bulb, buzzer, insulators, wood, rubber, plastic, glass, conductors, metal, switch, battery.	Solid, liquid, gas, air, evaporation, condensation, temperature, boil, melt, particles, freezing, heating.

YEAR FIVE				
Working Scientifically Skills • Children ask their own questions, sometimes abstract about what they observe and make decisions through predictions and hypotheses about which types of scientific enquiry are likely to be the best to answer their questions. • Children must talk first using scientific language and write later. • Children's scientific view of the world is deepened through a wider range of exploring, talking about, testing and developing ideas about everyday phenomena. • Children gather, record, classify and present data in a variety of ways. • Children record and report findings in drawings, explanations, labelled diagrams, keys, bar charts and tables. • Children observe changes over time, noticing patterns, grouping and classifying things and carrying out comparative and fair tests. • Children set up practical enquiries. • Children should find things out using a wide range of secondary sources. • Children should draw conclusions based on data and observations, use evidence to justify their ideas whilst using their deeper. Scientific knowledge and understanding to explain their findings. • Children should read, spell and pronounce scientific vocabulary accurately when working scientifically and around the curriculum.				
Y5 Living things and their habitats Biology	Y5 Animals including humans Biology	Y5 Properties and changes of materials Chemistry	Y5 Earth and space Physics	Y5 Forces Physics
Describe the differences in the life cycle of a mammal, amphibian, insect and a bird. Describe the life process of reproduction in some plants and animals.	Describe the changes as humans develop into old age.	Compare and group everyday materials on the basis of properties e.g. transparency, conductivity. Give reasons based on evidence from comparative and fair tests or the uses of everyday materials. Explore that some materials dissolve to form 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. Demonstrate that dissolving, mixing and changes of state are reversible changes. Explore that some changes result in the formation of new materials and that this.	Describe the movement of the Earth and other planets relative to the Sun in the Solar System. Describe the movement of the Moon relative to the Earth. Describe the Sun, Earth and Moon as approximately spherical bodies. Explore the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.	Explore the force of gravity acting between the Earth and a falling object. Identify the effects of air resistance, water resistance and friction, that act between moving surfaces. Identify that some mechanisms, including levers, pullets and gears, allow a smaller force to have a greater effect.

		Kind of change is not usually reversible e.g. changes associated with burning		
Key Vocabulary				
Mammal, reproduction, insect, amphibian, bird, offspring.	Foetus, embryo, womb, gestation, baby, toddler, teenager, elderly, growth, development, puberty.	Hardness, solubility, transparency, conductivity, magnetic, filter, evaporation, dissolving.	Earth, sun, moon, axis, rotation, day, night, phrases of the moon, star, constellation.	Air resistance, water resistance, gravity, friction, newton, gears, pulleys.

YEAR SIX
Working Scientifically Skills • Children ask their own questions, sometimes abstract about what they observe and make decisions through predictions and hypotheses about which types of scientific enquiry are likely to be the best to answer their questions. • Children must talk first using scientific language and write later. • Children's scientific view of the world is deepened through a wider range of exploring, talking about, testing and developing ideas about everyday phenomena. • Children gather, record, classify and present data in a variety of ways. • Children record and report findings in drawings, explanations, labelled diagrams, keys, bar charts and tables. • Children observe changes over time, noticing patterns, grouping and classifying things and carrying out comparative and fair tests. • Children set up practical enquiries. • Children should find things out using a wide range of secondary sources. • Children should draw conclusions based on data and observations, use evidence to justify their ideas whilst using their deeper. Scientific knowledge and understanding to explain their findings. • Children should read, spell and pronounce scientific vocabulary accurately when working scientifically and around the curriculum.

Y6 Living things and their habitats Biology	Y6 Animals including humans Biology	Y6 Evolution and inheritance Biology	Y6 Light Physics	Y6 Electricity Physics
Explore how living things are classified into common observable features, similarities and differences including micro-organisms, plants and animals Give reasons for classifying plants and animals based on specific characteristics	Identify the main parts of the human circulatory system and describe the functions of the heart, blood vessels and blood Recognise the impact of diet, exercise, drugs and lifestyle on how our bodies function Describe how nutrients and water are transported within animals including humans	Recognise that living things have changed over time and the information we can discover from them Recognise 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	Recognise that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye Explain that we see things because light travels from light sources to our eyes of from light sources to objects and then to our eyes Investigate the relationship between light sources, objects and shadows to explain the shape of shadows	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 in a circuit e.g. brightness of bulbs, loudness of buzzers Use recognised symbols when representing a simple circuit in a diagram
Key Vocabulary				
Classification, vertebrates, invertebrates, micro-organisms, amphibians, micro-organisms, reptiles, mammals, insects.	Circulatory, heart, blood, vessels, veins, arteries, oxygenated, deoxygenated, valve, exercise, respiration.	Fossils, adaption, evolution, characteristics, reproduction, genetics.	Refraction, reflection, light, spectrum, rainbow, colour.	Cells, wires, bulbs, switches, buzzers, battery, circuit, series, conductors, insulators, amps, volts.