Believe, Nurture, Grow, Flourish Together

Subject: Science Progression Plan

Reception	Children will explore the natural world around them, describing what they see, hear and feel outside. Children will recognise that some environments are different to the one in which they live and understand the effect of changing seasons on the natural world around them.					
	Key Stage 1		**Lower Key Stage 2**		**Upper Key Stage 2**	
	Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
Content: Plants	identify and name a variety of common wild and garden plants, including deciduous and evergreen trees identify and describe the basic structure of a variety of common flowering plants, including trees	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	identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers 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 part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal			

Subject: Science Progression Plan

Vocabulary	w ild, deciduous, evergreen, plants, trees, grow, species, root, stem, leaves, bulb, seed, flowers, petals, fruit, flower	germination, sprout, shoot, germination, seed dispersal, sunlight, temperature, nutrition	evaporation, fertilisation, stamen, carpel, sepal, pollination, pollinator,			
Content: Animals Including Humans	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	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	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 other 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 construct and interpret a variety of food chains, identifying producers, predators and prey	describe the changes as humans develop to old age	identify and name 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 the way their bodies function describe the ways in which nutrients and water are transported within animals, including humans

Subject: Science Progression Plan

	associated with each sense					
Vocabulary	amphibians, birds, fish, reptiles, carnivore, herbivore, omnivore, sight, touch, hear, smell, taste, head, neck, shoulders, chest, back, arms, hands, legs, feet, hips, mouth, nose, eyes, fingers, thumb, knee, teeth toes	offspring, young, life cycle, adult, live, diet, disease, exercise, diet, hygiene, germs, nutrition, pulse	healthy, nutrient, carbohydrate, protein, fat, sugar, fibre, vitamin, minerals, skeleton, parts of the skeleton, vertebrate, invertebrate, muscle, bicep, tricep, pair	Stomach, oesophagus, small intestine, large intestine, rectum, digest, incisor, premolar, canine, dentum, enamel, nerve, predator, prey, producer	prenatal, childhood, adolescent, adult, infancy, fertilisation, gestation, asexual, sexual, reproduce, puberty, menstruation, larynx, pubic, life expectancy	circulatory, heart, cardiac, blood vessels, oxygenated, deoxygenated, arteries, capillaries, lungs, blood, nutrients, oxygen, carbon dioxide,
Content: Everyday Materials	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	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	r ocks: compare and group together different kinds of rocks on the basis of their appearance and simple physical properties describe in simple terms how fossils are formed when things that have lived are trapped within rock soils are made from rocks and organic 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	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	

	everyday materials on the basis of their simple physical properties			rate of evaporation with temperature	separated, including through filtering, sieving and evaporating give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic demonstrate that dissolving, mixing and changes of state are reversible changes explain 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	
Vocabulary	material, property, stretchy, stiff, shiny, dull, rough, bendy, waterproof,	material, suitability, properties, twist, bend, squeeze, squash, flexible hard wearing, durable,	igneous rock, metamorphic, magma, lava, sediment, permeable, impermeable, fossil, soil, top soil,	solid, liquids, gases, water vapour, melt, freeze, boil,	solid, liquids, gases, dissolving, soluble insoluble, reversible, irreversible change,	

Subject: Science Progression Plan

	absorbent, transparent, opaque	McAdam, Dunlop, Macintosh	subsoil, base rock, peat, sand, clay, limestone, permeate, erode	cycle, evaporate, condense, precipitation	flammable, mixing, solution,	
Content: Living things and their habitats		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 microhabitats 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		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	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	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 give reasons for classifying plants and animals based on specific characteristics

Subject: Science Progression Plan

Vocabulary		life processes, living, dead, never living, food chain, food sources, habitat, micro habitat, survive, depend		sensitivity, movement, excretion, respiration, habitat, environment, endangered, extinct, growth, species, nutrition, specimen, classification	metamorphosis, ovule, fertilisation, gestation, life cycle,	characteristics, taxonomy, classification, domain, kingdom, psyllium, class, order, family, species, genus, bacteria, microorganism, yeast, fungi, penicillin
Content: Light			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 an opaque object find patterns in the way that the size of shadows change			recognise 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 explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes use the idea that light travels in straight lines to explain why shadows have

						the same shape as the objects that cast them
Vocabulary			light, dark, reflection, reflect, travel, pupil, retina, translucent, opaque, source			reflected ray, incidence ray, law of reflection, refraction, prism, spectrum
Content: Forces			compare how things move on different surfaces notice that some forces need contact between 2 objects, but magnetic forces can act at a distance observe how magnets attract or repel each other and attract some materials and not others compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials		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	

			describe magnets as having 2 poles predict whether 2 magnets will attract or repel each other, depending on which poles are facing			
Vocabulary			force, friction, surface, push, pull, magnet, magnetic force, poles, repel, attract, magnetic field		forces, gravity, weight, mass, gravitational pull, Isaac Newton, air resistance, water resistance, buoyancy, upthrust, friction, streamlined, levers, pulleys, lever, cogs, gear	
Content: electricity				identify common appliances that run on electricity construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers identify whether or not a lamp will light in a simple		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

				series circuit, based on whether or not the lamp is part of a complete loop with a battery 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		buzzers and the on/off position of switches use recognised symbols when representing a simple circuit in a diagram
Vocabulary				electricity, generate, appliances, conductor, insulator, circuit, cell, battery, light bulb, buzzer		current, amps, voltage, wire, switch, resistance, electrons
Content: One Off Units	observe changes across the 4 seasons observe and describe weather associated with			identify how sounds are made, associating some of them with something vibrating recognise that vibrations from sounds travel	describe the movement of the Earth and other planets relative to the sun in the solar system	recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago

Subject: Science Progression Plan

	the seasons and how day length varies			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	describe the movement of the moon relative to the Earth describe the sun, Earth and moon as approximately spherical bodies use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky	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
Vocabulary	Months of the year, four seasons, daylight, night			sound wave, amplitude, pitch, vibration, ear, particles, distance, ear drum, cochlear, vacuum	sun, star, spherical. planet, satellite, orbit, rotate, axis, geocentric model, heliocentric model, astronomer, telescope, rotate	adaptation may lead to evolution inheritance, variation, adaptation, environment, fossil, natural selection, inherited traits
Working Scientifically	asking simple questions and recognising that they can be answered in different ways observing closely, using simple equipment performing simple tests identifying and classifying using their observations and ideas to suggest answers to questions			asking relevant questions and using different types of scientific enquiries to answer them setting up simple practical enquiries, comparative and fair tests making systematic and careful observations and, where appropriate, taking accurate measurements using	planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate	

	gathering and recording data to help in answering questions	standard units, using a range of equipment, including thermometers and data loggers gathering, recording, classifying and presenting data in a variety of ways to help in answering questions recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions identifying differences, similarities or changes related to simple scientific ideas and processes using straightforward scientific evidence to answer questions or to support their findings.	recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs using test results to make predictions to set up further comparative and fair tests reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations identifying scientific evidence that has been used to support or refute ideas or arguments

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Subject: Science Progression Plan

A Year 1 Scientist
Working Scientifically should: ➢ know how to ask simple scientific questions. ➢ know how to use simple equipment to make observations. ➢ know how to carry out simple tests. ➢ know how to identify and classify things. ➢ know how to explain to others what I have found out. ➢ know how to use simple data to answer questions.
Biology – **Plants** ➢ know and name a variety of common wild and garden plants. ➢ know and name the petals, stem, leaves and root of a plant. ➢ know and name the roots, trunk, branches and leaves of a tree. **Animals, including humans** ➢ know and name a variety of animals including fish, amphibians, reptiles, birds and mammals. ➢ classify and know animals by what they eat (carnivore, herbivore and omnivore). ➢ know how to sort animals into categories (including fish, amphibians, reptiles, birds and mammals). ➢ know how to sort living and non-living things. ➢ know how to name the parts of the human body that I can see. ➢ know how to link the correct part of the human body to each sense.
Chemistry – **Everyday materials** ➢ distinguish between an object and the material it is made from. ➢ know the materials that an object is made from. ➢ know the difference between wood, plastic, glass, metal, water and rock. ➢ know about the properties of everyday materials. ➢ group objects based on the materials they are made from.
Physics - Seasonal changes ➢ observe and know about the changes in the seasons. ➢ name the seasons and know about the type of weather in each season.

Subject: Science Progression Plan

A Year 2 Scientist
- Working Scientifically should: ➢ know how to ask simple scientific questions. ➢ know how to use simple equipment to make observations. ➢ know how to carry out simple tests. ➢ know how to identify and classify things. ➢ know how to explain to others what I have found out. ➢ know how to use simple data to answer questions.
Biology **Living things and their habitats** ➢ identify things that are living, dead and never lived. ➢ know how a specific habitat provides for the basic needs of things living there (plants and animals). ➢ identify and name plants and animals in a range of habitats. ➢ match living things to their habitat. ➢ know how animals find their food. ➢ name some different sources of food for animals. ➢ know and can explain a simple food chain. **Plants** ➢ know how seeds and bulbs grow into plants. ➢ know what plants need in order to grow and stay healthy (water, light & suitable temperature). **Animals, including humans** ➢ know the basic stages in a life cycle for animals, including humans. ➢ know what animals and humans need to survive. ➢ know why exercise, a balanced diet and good hygiene are important for humans.
Chemistry **Uses of everyday materials** ➢ identify and name a range of materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard. ➢ know why a material might or might not be used for a specific job. ➢ know how materials can be changed by squashing, bending, twisting and stretching.
Physics - no content

Subject: Science Progression Plan

A Year 3 Scientist
Working Scientifically should: ➢ know how to ask relevant scientific questions. ➢ know how to use observations and knowledge to answer scientific questions. ➢ know how to set up a simple enquiry to explore a scientific question. ➢ know how to set up a test to compare two things. ➢ know how to set up a fair test and explain why it is fair. ➢ make careful and accurate observations, including the use of standard units. ➢ know how to use equipment, including thermometers and data loggers to make measurements. ➢ gather, record, classify and present data in different ways to answer scientific questions. ➢ know how to use diagrams, keys, bar charts and tables; using scientific language. ➢ know how to use findings to report in different ways, including oral and written explanations, presentation. ➢ know how to draw conclusions and suggest improvements. ➢ know how to make a prediction with a reason. ➢ know how to identify differences, similarities and changes related to an enquiry.
Biology **Plants** ➢ know the function of different parts of flowing plants and trees. ➢ know what different plants need to help them survive. ➢ know how water is transported within plants. ➢ know the plant life cycle, especially the importance of flowers. **Animals, including humans** ➢ know about the importance of a nutritious, balanced diet. ➢ know how nutrients, water and oxygen are transported within animals and humans. ➢ know about the skeletal system of a human. ➢ know about the muscular system of a human. ➢ know about the purpose of the skeleton in humans and animals.

Subject: Science Progression Plan

Chemistry

Rocks

- compare and group rocks based on their appearance and physical properties, giving a reason.
- know how fossils are formed.
- know how soil is made.
- know about and explain the difference between sedimentary, metamorphic and igneous rock.

Physics

Light

- know what dark is (the absence of light).
- know that light is needed in order to see.
- know that light is reflected from a surface.
- know and demonstrate how a shadow is formed.
- explore shadow size and explain the changes.
- know the danger of direct sunlight and describe how to keep protected.

Forces and magnets

- know about and describe how objects move on different surfaces.
- know how some forces require contact and some do not, giving examples.
- know about and explain how objects attract and repel in relation to objects and other magnets.
- predict whether objects will be magnetic and carry out an enquiry to test this out.
- know how magnets work.
- predict whether magnets will
- attract or repel and give a reason.

Subject: Science Progression Plan

Year 4 Scientist
Working Scientifically should: ➢ know how to ask relevant scientific questions. ➢ know how to use observations and knowledge to answer scientific questions. ➢ know how to set up a simple enquiry to ➢ explore a scientific question. ➢ know how to set up a test to compare two things. ➢ know how to set up a fair test and explain why it is fair. ➢ make careful and accurate observations, including the use of standard units. ➢ know how to use equipment, including thermometers and data loggers to make measurements. ➢ gather, record, classify and present data in different ways to answer scientific questions. ➢ know how to use diagrams, keys, bar charts and tables; using scientific language. ➢ know how to use findings to report in different ways, including oral and written explanations, presentation. ➢ know how to draw conclusions and suggest improvements. ➢ know how to make a prediction with a reason. ➢ know how to identify differences, similarities and changes related to an enquiry.
Biology **Living things and their habitats** ➢ group living things in different ways. ➢ use classification keys to group, identify and name living things. ➢ create classification keys to group, identify and name living things (for others to use). ➢ know how changes to an environment could endanger living things. **Animals, including humans** ➢ identify and name the parts of the human digestive system. ➢ know the functions of the organs in the human digestive system. ➢ identify and know the different types of teeth in humans. ➢ know the functions of different human teeth. ➢ use food chains to identify producers, predators and prey. ➢ construct food chains to identify producers, predators and prey.

Subject: Science Progression Plan

Chemistry

States of matter

- group materials based on their state of matter (solid, liquid, gas).
- know how some materials can change state.
- explore how materials change state.
- measure the temperature at which materials change state.
- know about the water cycle.
- know the part played by evaporation and condensation in the water cycle.

Physics

Sound

- know how sound is made.
- know how sound travels from a source to our ears.
- know how sounds are made, associating some of them with vibrating.
- know the correlation between pitch and the object producing a sound.
- know the correlation between the volume of a sound and the strength of the vibrations that produced it.
- know what happens to a sound as it travels away from its source.

Electricity

- identify and name appliances that require electricity to function.
- construct a series circuit.
- identify and name the components in a series circuit (including cells, wires, bulbs, switches and buzzers).
- know how to draw a circuit diagram.
- predict and test whether a lamp will light within a circuit.
- know the function of a switch in a circuit.
- know the difference between a conductor and an insulator; giving examples of each.

Subject: Science Progression Plan

Year 5 Scientist
- Working Scientifically should: ➢ know how to plan different types of scientific enquiry. ➢ know how to control variables in an enquiry. ➢ measure accurately and precisely using a range of equipment. ➢ know how to record data and results using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs. ➢ use the outcome of test results to make predictions and set up a further comparative and fair tests. ➢ report findings from enquiries in a range of ways. ➢ how to explain a conclusion from an enquiry. ➢ explain causal relationships in an enquiry. ➢ know how to relate the outcome from an enquiry to scientific knowledge in order to state whether evidence supports or refutes an argument or theory. ➢ read, spell and pronounce scientific vocabulary accurately.
Biology **Living things and their habitats** ➢ know the life cycle of different living things, e.g. mammal, amphibian, insect bird. ➢ know the differences between different life cycles. ➢ know the process of reproduction in plants. ➢ know the process of reproduction in animals. **Animals, including humans** ➢ create a timeline to indicate stages of growth in human
Chemistry **Properties and changes of materials** ➢ compare and group materials based on their properties (e.g. hardness, solubility, transparency, conductivity, [electrical & thermal], and response to magnets). ➢ know how a material dissolves to form a solution; explaining the process of dissolving. ➢ know and show how to recover a substance from a solution. ➢ know how some materials can be separated. ➢ demonstrate how materials can be separated (e.g. through filtering, sieving and evaporating). ➢ know and can demonstrate that some changes are reversible and some are not.

- know how some changes result in the formation of a new material and that this is usually irreversible.
- know about reversible and irreversible changes.
- give evidenced reasons why materials should be used for specific purposes.

Physics

Earth and space

- know about and explain the movement of the Earth and other planets relative to the Sun.
- know about and explain the movement of the Moon relative to the Earth.
- know and demonstrate how night and day are created.
- describe the Sun, Earth and Moon (using the term spherical).

Forces

- know what gravity is and its impact on our lives.
- identify and know the effect of air resistance.
- identify and know the effect of water resistance.
- identify and know the effect of friction.
- explain how levers, pulleys and gears allow a smaller force to have a greater effect.

A Year 6 Scientist

- Working Scientifically should:

- know how to plan different types of scientific enquiry.
- know how to control variables in an enquiry.
- measure accurately and precisely using a range of equipment.
- know how to record data and results using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.
- use the outcome of test results to make predictions and set up a further comparative and fair tests.
- report findings from enquiries in a range of ways.
- know how to explain a conclusion from an enquiry.
- explain causal relationships in an enquiry.
- know how to relate the outcome from an enquiry to scientific knowledge in order to state whether evidence supports or refutes an argument or theory.
- read, spell and pronounce scientific vocabulary accurately.

Subject: Science Progression Plan

Biology

Living things and their habitats

- classify living things into broad groups according to observable characteristics and based on similarities & differences.
- know how living things have been classified.
- give reasons for classifying plants and animals in a specific way.

Animals, including humans

- identify and name the main parts of the human circulatory system.
- know the function of the heart, blood vessels and blood.
- know the impact of diet, exercise, drugs and life style on health.
- know the ways in which nutrients and water are transported in animals, including humans.

Evolution and inheritance

- know how the Earth and living things have changed over time.
- know how fossils can be used to find out about the past.
- know about reproduction and offspring (recognising that offspring normally vary and are not identical to their parents).
- know how animals and plants are adapted to suit their environment.
- link adaptation over time to evolution.
- know about evolution and can explain what it is.

Chemistry

No content

Physics

Light

- know how light travels.
- know and demonstrate how we see objects.
- know why shadows have the same shape as the object that casts them.
- know how simple optical instruments work, e.g. periscope, telescope, binoculars, mirror, magnifying glass etc.

Electricity

- know how the number & voltage of cells in a circuit links to the brightness of a lamp or the volume of a buzzer.
- compare and give reasons for why components work and do not work in a circuit.
- draw circuit diagrams using correct symbols