

RWPA SCIENCE PROGRESSION

- Substantive knowledge strands
- Disciplinary knowledge



Animals including Humans

EYFS-Early Learning Goal links: Explore the natural world around them, making observations and drawing pictures of animals and plants.

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
- 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	- Understand that animals, including humans, have offspring which grow into adults - 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 (LINK BACK: Y3 the different food groups our body needs-nutrients) - 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 (see Life Cycles - Living things and their habitats)	- 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
arm, leg, hand, foot, eyes, ears, mouth, nose see, hear, taste, smell, touch fish, amphibian, reptile, bird and mammal herbivore, carnivore, omnivore	offspring, adult, baby, parents dead, alive, never-alive	carbohydrates, protein, fats, sugar, dairy, fruit and vegetables, balanced diet, energy skeleton, vertebrates/invertebrates, muscles, bones, ribs, skull, joints, spine, pelvis	molars, canines, incisors oesophagus, saliva, stomach, intestines, anus, digestion, nutrients food chain, energy, producer, predator, prey, decomposer	puberty life-cycle reproduce	heart, blood, lungs, oxygenated, deoxygenated, plasma, platelets, red and white blood cells, plasma blood vessels, veins, arteries, pulse

Living things and their Habitats

EYFS-Early Learning Goal links: Explore the natural world around them, making observations and drawing pictures of animals and plants.

Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class.

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	- 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.		- 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 and have an impact on living things	- Describe the differences in the life cycles of a mammal, amphibian, insect and a bird - Describe how different plants reproduce using the vocabulary related to pollination, asexual reproduction and seed dispersal	- Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants and animals - Give reasons for classifying plants and animals based on specific characteristics
fish, amphibian, reptile, bird and mammal herbivore, carnivore, omnivore	dead, alive, never alive habitat- desert, arctic, rainforest, ocean food chain, predator, prey diet		classify, classification, classification key environment, deforestation, pollution, extinction, endangered producer, decomposer	life cycle, reproduction, pollination, fertilisation, asexual reproduction, seed dispersal, fruit, stigma, anther, ovary, ovule, pollen, nectar,	microorganism, germ, microbe, characteristic, Linnaean system

Plants

EYFS-Early Learning Goal links: Explore the natural world around them, making observations and drawing pictures of animals and plants

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
- 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	<i>See Living things and their habitats- Plant reproduction, seed dispersal, life cycles)</i>	Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution
deciduous, evergreen, plant, tree, leaf, stem, flower, petals, roots	seed, bulb, germination, temperature, sunlight, water, healthy, root, shoot	nutrients, photosynthesis, function	pollination, seed dispersal, stigma, anther, ovary, ovule, pollen, nectar,	life cycle, reproduction, asexual reproduction,	adaptation, evolution,

Evolution and Inheritance

EYFS-Early Learning Goal links: Know some similarities and differences between things in the past and now, drawing on their experiences and what has been read in class.

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
(Links with Animals including Humans work on Parents and Offspring?)					- Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago - 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
parent, baby		fossil (from unit on rocks)			offspring characteristic adaptation, natural selection, identical, genes, Charles Darwin

Seasonal changes

EYFS-Early Learning Goal links: Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
- Observe changes across the four seasons - Observe and describe weather associated with the seasons and how day length varies			water cycle- different types of precipitation	Link to Space unit- Why do we have different Seasons?	
autumn, winter, spring, summer, rain, snow, frost, wind, sun, fog, mist, clouds, temperature (warm/cold/freezing) day, night,			precipitation- snow, hail, rain		

Materials and States of Matter

EYFS-Early Learning Goal links: Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.
Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class.

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
- 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 on the basis of their simple physical properties	- Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses - Describe how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching	(Rocks, Light, Magnets)	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 - Know that some materials are good thermal insulators that prevent the transfer of heat from warm to cold	- 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 - Recognise 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 - 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	
object, material, wood, plastic, metal, water, rock, fabric property- everyday language e.g hard/soft, stretchy, rough, bendy, see-through, strong etc sort, waterproof	squash, bend, twist, stretch	absorbent/not absorbent, durable transparent, translucent, opaque magnetic	solid, liquid, gas, state, heat, cool, melt, freeze, evaporate, condense, thermometer, temperature, degrees celsius, The water cycle, precipitation, thermal insulator	dissolve, soluble, insoluble, solution, conductor, insulator, filter, filtering, filter paper, sieving, evaporation, reversible change, irreversible change, burning	

Electricity

EYFS-Early Learning Goal links:

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Know that electricity is needed to make some things work.	Know that electricity is needed to make some things work. Know that some appliances need batteries and some use mains electricity to work.		- 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 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		- 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 - Use recognised symbols when representing a simple circuit in a diagram
			electricity, mains electricity, battery, wire, bulb, buzzer, motor, switch, circuit, electrical conductor, electrical insulators, metals		cell, voltage, component, circuit diagram, symbols

Earth and Space

EYFS-Early Learning Goal links: Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.
Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class.

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
				- 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 - Use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky	
day, night, sun, moon				solar system, orbit, sphere, Earth's axis, planets (Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune) gas giant, terrestrial planet, meteor, star crater	

Forces and Magnets

EYFS-Early Learning Goal links: Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.
Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class.

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Explore floating and sinking, pushes and pulls.	Explore cars moving quicker on different surfaces.	- Compare how things move on different surfaces - Notice that some forces need contact between two objects, but magnetic forces can act at a distance - 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 - Describe magnets as having two poles Predict whether two magnets will attract or repel each other, depending on which poles are facing		- 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	
float, sink, push pull		magnet, magnetic, poles, north pole, south pole, magnetic force, attract, repel, metals, friction, force metre		gravity, air resistance, water resistance, mechanism, machine, lever, pulley, gears, work	

Light

EYFS-Early Learning Goal links: Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Know that we use our eyes to see		- Recognise that he/she needs 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 eyes - Find patterns in the way that the size of shadows change		<i>(Link and revisit- Year 5 work on Space, Day and Night, Shadows on the Moon)</i>	- 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. Notice how light can be split into different colours using a prism.
eyes sight light sun		source of light darkness reflect, mirror translucent transparent opaque shadow			prism periscope

Sound

EYFS-Early Learning Goal links: Sing a range of well-known nursery rhymes and songs; - Perform songs, rhymes, poems and stories with others, and - when appropriate - try to move in time with music.

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Exploring how to change the volume of a sound during music lessons. Know we use our ears to hear	Exploring how to change the volume and pitch of a sound during music lessons.	Exploring how to change the volume and pitch of a sound during music lessons.	- 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	Links with Music	Links with Music
ear sound hearing			vibration volume pitch		

Rocks

EYFS-Early Learning Goal links: Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class.

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
		- 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 - Recognise that soils are made from rocks and organic matter			Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago
		fossil rock sedimentary soil organic matter crystals molten rock, lava			palaeontologist

Disciplinary knowledge progression EYFS-KS1

EYFS (Early Learning Goal links)	Y1/2
Show curiosity about objects, events and people ELG: Understanding the world -The natural world Questions why things happen ELG: Speaking:	I can explore the world around and raise my own simple questions
Engage in open-ended activity Playing & Exploring AOP Active learning (motivation)	I have experienced different types of science enquiries, including practical activities
Take a risk, engage in new experiences and learn by trial and error Playing & Exploring	I am beginning to recognise different ways in which I might answer scientific questions
Critically Find ways to solve problems / find new ways to do things / test their ideas Creating & Thinking	I can carry out simple tests
Develop ideas of grouping, sequences, cause and effect Creating & Thinking Critically Know about similarities and differences in relation to places, objects, materials and living things ELG: Understanding the World- The natural world	I can use simple features to compare objects, materials and living things and, with help, decide how to sort and group them (identifying and classifying)
Comments and asks questions about aspects of their familiar world such as the place where they live or the natural world ELG: The Natural world, People and communities	I can ask questions and use simple secondary sources to find answers
Closely observes what animals, people and vehicles do ELG: The Natural world Use senses to explore the world around them Playing & Exploring	I can observe closely, using simple equipment with help, and observe changes over time.
Make links and notice patterns in their experience Creating & Thinking Critically	With help, I am starting to notice patterns and relationships.
Choose the resources they need for their chosen activities ELG: Managing self Handle equipment and tools effectively ELG: Moving & Handling	I can use simple measurements and equipment (e.g. hand lenses, egg timers) to gather data
Create simple representations of events, people and objects ELG: Being imaginative and expressive, writing	I can record simple data in a table or tally chart
Answer how and why questions about their experiences ELG: Understanding , Speaking Make observations of animals and plants and explain why some things occur, and talk about changes ELG: The Natural World	I can use my observations and ideas to suggest answers to questions I can talk about what I have found out and how I found it out
Develop their own narratives and explanations by connecting ideas or events ELG: Speaking Builds up vocabulary that reflects the breadth of their experience ELG: Speaking, Understanding	With help, I can record and communicate my findings in a range of ways and begin to use simple scientific language
test question float sort observe sink measure magnifying glass investigate enquire weigh sort heavy light seasons temperature weather	research thermometer tally chart data logger bar graph fair test

Disciplinary knowledge progression KS1 - KS2

Year 1/2	Year 3/4	Year 5/6
I can explore the world around and raise my own simple questions	I can raise my own relevant questions about the world around me	I can use my science experiences to explore ideas and raise different kinds of questions
I have experienced different types of science enquiries, including practical activities	I have been given a range of scientific experiences including different types of science enquiries to answer questions	I can talk about how scientific ideas have developed over time
I am beginning to recognise different ways in which I might answer scientific questions	I am starting to make my own decisions about the most appropriate type of scientific enquiry that might be best to answer a question.	I can select and plan the most appropriate type of scientific enquiry to use to answer a scientific question.
I can carry out simple tests	I can set up simple practical enquiries, comparative and fair tests I recognise when a simple fair test is necessary and help to decide how to set it up.	I recognise when and how to set up comparative and fair tests and explain which variables need to be controlled and why.
I can use simple features to compare objects, materials and living things and, with help, decide how to sort and group them (identifying and classifying)	I can talk about criteria for grouping, sorting and classifying; and use simple keys	I can use and develop keys and other information records to identify, classify and describe living things and materials, and identify patterns that might be found in the natural environment
I can ask questions and use simple secondary sources to find answers	I can recognise when and how secondary sources might help them to answer questions that cannot be answered through practical investigations	I can recognise which secondary sources will be most useful to research my ideas and begin to separate opinion from fact
I can observe closely, using simple equipment with help, and observe changes over time.	I can make systematic and careful observations I help to make decisions about what observations to make, how long to make them for and the type of simple equipment that might be used.	I can make my own decisions about what observations to make, what measurements to use and how long to make them for.
With help, I am starting to notice patterns and relationships.	I am beginning to look for patterns and decide what data to collect to identify them	I can look for different causal relationships in my data and identify evidence that refutes or supports their ideas
I can use simple measurements and equipment (e.g. hand lenses, egg timers) to gather data	I can take accurate measurements using standard units learn how to use a range of (new) equipment, such as data loggers / thermometers appropriately	I can choose the most appropriate equipment to make measurements with increasing precision and explain how to use it accurately
I can record simple data in a table or tally chart	I can collect and record data from my own observations and measurements in a variety of ways: I can make notes, bar charts and tables, standard units, drawings, labelled diagrams, keys and help to make decisions about how to analyse this data	I can decide how to record data and results of increasing complexity from a choice of familiar approaches: scientific diagrams and labels, classification keys, tables, and bar and line graphs
I can use my observations and ideas to suggest answers to questions I can talk about what I have found out and how I found it out	With help, I look for changes, patterns, similarities and differences in my data in order to draw simple conclusions and answer questions.	I can identify scientific evidence that has been used to support or refute ideas or arguments
With help, I can record and communicate my findings in a range of ways and begin to use simple scientific language	I can use relevant simple scientific language to discuss my ideas and communicate my findings in ways that are appropriate for different audiences, including oral and written explanations, displays or presentations of results and conclusions	I can use relevant scientific language and illustrations to discuss, communicate and justify my scientific ideas, I can use oral and written forms such as displays and other presentations to report conclusions, causal relationships and explanations of results I can use simple models to describe scientific ideas
	With support, I can identify new questions arising from the data, making predictions for new values within or beyond the data I have collected and find ways of improving what I have already done.	I can use my results to make predictions and identify when further observations, comparative and fair tests might be needed
research tally chart bar graph	classify key investigation	variable repeated measurements conclusion

