



SCIENCE PROGRESSION GRID

Intent: At Parsloes Primary School we believe that a high-quality science curriculum provides the foundations for understanding the world. Science encompasses the acquisition of new knowledge, concepts and skills; encouraging pupils to recognise the power of rational explanation and develop a sense of excitement and curiosity about natural wonders that occur on our planet. During active and engaging lessons, pupils will learn and discuss scientific theories and processes, which will enable them to answer scientific questions about the world. They will develop scientific enquiry skills and use scientific language to explain concepts confidently.

KEY VOCABULARY

NURSERY	RECEPTION	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6
animal material plastic wood plant seed grow caterpillar butterfly float sink	body legs chest back bones melting freezing sound hard soft leaves stem roots flower light shadow weather	season temperature deciduous evergreen fruit bulb trunk fish amphibian reptile mammal bird carnivore herbivore omnivore absorbent flexible opaque transparent waterproof	habitat microhabitat food chain predator prey producer climate minerals germination extinct life cycle offspring hygiene exercise disease suitability conductor insulator	pollination seed dispersal ovary stigma style stamen pollen nutrition muscles ligaments skull spine sternum pelvis tibia fibula igneous metamorphic sedimentary light source light ray force friction magnetic	vertebrates invertebrates species digestion oesophagus small intestine large intestine canines molars incisors solids liquids gases molecules particles evaporation condensation precipitation vibrations sound wave pitch amplitude series circuit cells conductors insulators	reproduction anther fertilisation gestation hormone nerves organ puberty soluble insoluble solute solvent galaxy solar system planet orbit gravity element air resistance water resistance mechanisms Newton acceleration static friction sliding friction force meter weight	microorganism monera protista fungi circulatory system artery vein evolution inheritance adaptation variation natural selection artificial selection refraction spectrum atom component electron negative terminal positive terminal series circuit parallel circuit resistance terminal voltage current

NURSERY	RECEPTION	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6
Biology							
Plant seeds and care for growing plants	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 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 associated with each sense	Plants 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 Animals, Including Humans 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 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	Plants 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 Animals, Including Humans 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,	Animals, Including Humans 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 Living Things and Their Habitats 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	Animals, Including Humans Describe the changes as humans develop to old age Living Things and Their Habitats 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	Living Things and Their Habitats 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 Animals, Including Humans 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 Evolution and Inheritance Recognise that living things have changed over time	

		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	protection and movement			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
	Chemistry					
	Use all their senses in hands-on exploration of natural materials Explore collections of materials with similar and/or different properties. Talk about what they see, using a wide vocabulary Talk about the differences between materials and changes they notice: melting – leave ice cubes out in the sun, see what happens when you shake salt onto them (children should not touch to avoid danger of frostbite)	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 everyday materials on the basis of their simple physical properties	Materials 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	Rocks 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	States of 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 rate of evaporation with temperature	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
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

Physics

Explore how things work

Explore and talk about different forces they can feel:

- how the water pushes up when they try to push a plastic boat under it
- how they can stretch elastic, snap a twig, but cannot bend a metal rod
- magnetic attraction and repulsion

Explore how different materials sink and float

Explore how you can shine light through some materials, but not others

Investigate shadows

Observe and interact with natural processes, such as ice melting, a sound causing a vibration, light travelling through transparent material, an object casting a

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

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
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

Earth and Space

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
Use the idea of the Earth's rotation to explain day and night and the apparent movement

Light

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

	shadow, a magnet attracting an object and a boat floating on water			Find patterns in the way that the size of shadows change Forces and Magnets Compare how things move on different surfaces 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 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	vibrations that produced it Recognise that sounds get fainter as the distance from the sound source increases 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 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	of the sun across the sky 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	Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them 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 Use recognised symbols when representing a simple circuit in a diagram
	Asking questions and recognising that they can be answered in different ways						
	Ask simple questions recognising that they can be answered in different ways	Ask simple questions and recognising that they can be answered in different ways	Ask relevant questions and using different types of scientific enquiries to answer them	Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary			
Children are encouraged to explore the natural world to foster curiosity. They begin to develop the ability to ask questions	While exploring the world, the children develop their ability to ask questions (such as what something is, how things are similar and different, the ways things work,	The children consider their prior knowledge when asking questions. They independently use a range of question stems. Where appropriate, they answer these questions.	Children independently ask scientific questions. This may be stimulated by a scientific experience or involve asking				

	about what is happening and how things change. Through guided discussion with adults, children answer questions about what they can see in the natural world around them. After observing and interacting with natural processes, such as ice melting, children can answer simple questions about what happened and why.	which alternative is better, how things change and how they happen). Where appropriate, they answer these questions. The children answer questions developed with the teacher often through a scenario. The children are involved in planning how to use resources provided to answer the questions using different types of enquiry, helping them to recognise that there are different ways in which questions can be answered.	The children answer questions posed by the teacher. Given a range of resources, the children decide for themselves how to gather evidence to answer the question. They recognise when secondary sources can be used to answer questions that cannot be answered through practical work. They identify the type of enquiry that they have chosen to answer their question.	further questions based on their developed understanding following an enquiry. Given a wide range of resources the children decide for themselves how to gather evidence to answer a scientific question. They choose a type of enquiry to carry out and justify their choice. They recognise how secondary sources can be used to answer questions that cannot be answered through practical work.
	Making observations and taking measurements			
	Observe closely the natural world around them, using their senses and some appropriate equipment such as magnifying glasses. Draw pictures of the natural world based on observations. Measure through comparisons.	Observing closely, using simple equipment Children explore the world around them. They make careful observations to support identification, comparison and noticing change. They use appropriate senses, aided by equipment such as magnifying glasses or digital microscopes, to make their observations. They begin to take measurements, initially by comparisons, then using non-standard units.	Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers The children make systematic and careful observations. They use a range of equipment for measuring length, time, temperature and capacity. They use standard units for their measurements.	Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate The children select measuring equipment to give the most precise results e.g. ruler, tape measure or trundle wheel, force meter with a suitable scale. During an enquiry, they make decisions e.g. whether they need to: take repeat readings (fair testing); increase the sample size (pattern seeking); adjust the observation period and frequency (observing over time); or check further secondary sources (researching); in order to get accurate data (closer to the true value).
	Engaging in practical enquiry to answer questions			
	Performing simple tests Interact with natural processes, such as ice melting, sound causing a vibration, objects casting a shadow, a magnet attracting an object and a boat floating on water. Explore scientific phenomena with practical resources to gather evidence to answer a question e.g. what is attracted to a magnet? Children can compare and sort materials and living things.	Performing simple tests The children use practical resources provided to gather evidence to answer questions generated by themselves or the teacher. They carry out: tests to classify; comparative tests; pattern seeking enquiries; and make observations over time. Children use their observations and testing to compare objects, materials and living things. They sort and group these things, identifying their own criteria for sorting.	Setting up simple practical enquiries, comparative and fair tests The children select from a range of practical resources to gather evidence to answer questions generated by themselves or the teacher. They follow their plan to carry out: observations and tests to classify; comparative and simple fair tests; observations over time; and pattern seeking.	Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary The children select from a range of practical resources to gather evidence to answer their questions. They carry out fair tests, recognising and controlling variables. They decide what observations or measurements to make over time and for how long. They look for patterns and relationships using a suitable sample.

	Children observe the changes in the natural world over time, particularly related to the changing seasons.	They use simple secondary sources (such as identification sheets) to name living things. They describe the characteristics they used to identify a living thing.		
	Recording and presenting evidence			
	Gather data to help answer questions Children record their observations of the natural world through drawing and labelling Children classify and sort using sorting rings and practical resources	Gathering and recording data to help in answering questions The children record their observations e.g. using photographs, videos, drawings, labelled diagrams or in writing. They record their measurements e.g. using prepared tables, pictograms, tally charts and block graphs. They classify using simple prepared tables and sorting rings.	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 The children sometimes decide how to record and present evidence. They record their observation e.g. using photographs, videos, pictures, labelled diagrams or writing. They record their measurements e.g. using tables, tally charts and bar charts (given templates, if required, to which they can add headings). They record classifications e.g. using tables, Venn diagrams, Carroll diagrams. Children are supported to present the same data in different ways in order to help with answering the question.	Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs The children decide how to record and present evidence. They record observations e.g. using annotated photographs, videos, labelled diagrams, observational drawings, labelled scientific diagrams or writing. They record measurements e.g. using tables, tally charts, bar charts, line graphs and scatter graphs. They record classifications e.g. using tables, Venn diagrams, Carroll diagrams and classification keys. Children present the same data in different ways in order to help with answering the question.
	Answering questions and concluding			
	Using their observations and ideas to suggest answers to questions Children explore the natural world to find answers to questions. They develop their answers through discussion with adults. Children recognise 'biggest and smallest', 'best and worst' etc through exploration.	Using their observations and ideas to suggest answers to questions Children use their experiences of the world around them to suggest appropriate answers to questions. They are supported to relate these to their evidence e.g. observations they have made, measurements they have taken or information they have gained from secondary sources. The children recognise 'biggest and smallest', 'best and worst' etc. from their data.	Using straightforward scientific evidence to answer questions or to support their findings Children answer their own and others' questions based on observations they have made, measurements they have taken or information they have gained from secondary sources. The answers are consistent with the evidence.	Identifying scientific evidence that has been used to support or refute ideas or arguments Children answer their own and others' questions based on observations they have made, measurements they have taken or information they have gained from secondary sources. When doing this, they discuss whether other evidence e.g. from other groups, secondary sources and their scientific understanding, supports or refutes their answer. They talk about how their scientific ideas change due to new evidence that they have gathered. They talk about how new discoveries change scientific understanding.

			Identifying differences, similarities or changes related to simple scientific ideas and processes Children interpret their data to generate simple comparative statements based on their evidence. They begin to identify naturally occurring patterns and causal relationships.	Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations In their conclusions, children: identify causal relationships and patterns in the natural world from their evidence; identify results that do not fit the overall pattern; and explain their findings using their subject knowledge.
			Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions They draw conclusions based on their evidence and current subject knowledge.	
	Evaluating and raising further questions and predictions			
		Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions They identify ways in which they adapted their method as they progressed or how they would do it differently if they repeated the enquiry.	Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations They evaluate, for example, the choice of method used, the control of variables, the precision and accuracy of measurements and the credibility of secondary sources used. They identify any limitations that reduce the trust they have in their data.	
		Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions Children use their evidence to suggest values for different items tested using the same method e.g. the distance travelled by a car on an additional surface. Following a scientific experience, the children ask further questions which can be answered by extending the same enquiry.	Using test results to make predictions to set up further comparative and fair tests Children use the scientific knowledge gained from enquiry work to make predictions they can investigate using comparative and fair tests.	

	Communicating their findings		
		Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions They communicate their findings to an audience both orally and in writing, using appropriate scientific vocabulary.	Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations They communicate their findings to an audience using relevant scientific language and illustrations.
	ASSESSMENT (using the skills above to assess the knowledge)		

KEY ENQUIRY BIG QUESTIONS

Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Understanding the World Can we name animals? What materials can we see? How do plants grow? What does a caterpillar turn into? What floats and what sinks?	Understanding the World What are the different parts of my body? How are animals different to each other? How can we make ice change into water? What sounds can we hear? How can we describe different materials? What do we notice about different plants? How can we create shadows?	Animals inc. Humans How can we identify different animals? Plants How can we identify different plants? Everyday Materials How can we classify materials? Animals inc. Humans How do humans use their senses?	Living Things/Habitats How do animals survive in different habitats? Animals inc. Humans What do animals and humans need to survive Animals inc. Humans Why is exercise and diet important? Plants How do plants grow and survive? Materials Which materials are best to use for particular uses?	Plants What are the functions of the different parts of plants Rocks How can we compare and group different rocks and soils? Animals inc. Humans Why do animals and humans have skeletons and muscles? Light Where does light come from? How are shadows formed? Forces and Magnets What is a magnet? Which materials are magnetic?	Animals inc. Humans What is the digestive system and what part do teeth play? Sound What are vibrations, pitch and volume? Electricity What do you need to create a series circuit? Living Things/Habitats How do food chains work? How can you classify animals? States of Matter What are the changes in state for solids, liquids and gases?	Materials and Properties What are the reversible and irreversible changes of solids, liquids and gases? Earth and Space/Forces How do the bodies of the solar system move and what effect is created? Living Things/Habitats How do life cycles of different animal groups compare? Forces What are the effects of water resistance and friction?	Living Things/Habitats How do we classify animals based on specific characteristics? How are water and nutrients transported around the body? Electricity How do we create and compare circuits with a variety of components? Animals inc. Humans What is the circulatory system? Light How does light travel and reflect? Evolution and Inheritance How have living things changed over the years?