



Riversdale Primary School

SCIENCE PROGRESSION

DISCIPLINARY CONCEPTS									
Biology				Chemistry	Physics				
Animals Including Humans	Evolution & Inheritance	Living Things & Their Habitats	Plants	Materials	Earth & Space	Electricity	Forces	Light	Sound

GENERAL OVERVIEW EYFS	
<u>Nursery:</u> <u>Communication and Language:</u> - Understand 'why' questions like why do you think the caterpillar got so fat? <u>Physical Development:</u> - Make healthy choices about food and drink, activity and tooth brushing. <u>Understanding the World:</u> - Use all their senses in hands on exploration of natural material. - Explore collections of materials with similar and/or different properties. - Talk about what they see, using a wide vocabulary. - Begin to make sense of their own life story and family's history. - 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. - Begin to understand the need to respect and care for the natural environment and all living things. - Explore and talk about different forces they can feel. - Talk about differences between materials and changes they notice.	<u>Reception:</u> <u>Communication and Language:</u> - Learn new vocabulary. - Ask questions to find out more and check what has been said. - Articulate ideas and thoughts in well-formed sentences. - Describe events in some detail. - Use talk to work out problems and organize thinking and activities. Explain how things work and why they might happen. - Use new vocabulary. <u>ELG Communication and Language:</u> - Make comments about what they have heard and ask questions to clarify their understanding. <u>Understanding the World:</u> - Explore the natural world around them-describe what they see, hear, and feel while they are outside. - Recognise some environments that are different to the one in which they live. - Understand the effect of changing seasons on the natural world around them. <u>ELG Understanding the World:</u> - 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.

	• Understand some important processes and changes in the natural world around them, including seasons and changing states of matter. <u>Physical Development:</u> • Know and talk about the different factors that support their overall health and wellbeing, regular physical activity, healthy eating, toothbrushing, sensible amounts of 'screen time', having a good sleep routine, being a safe pedestrian. <u>ELG Managing Self:</u> • Manage their own basic hygiene and personal needs, including dressing, going to the toilet and understanding the importance of healthy food choices.
--	--

PROGRESSION OF DISCIPLINARY KNOWLEDGE						
	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 1	Animals Including Humans Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense. 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).		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.		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.	
	Earth & Space Observe changes across the four seasons. Observe and describe weather associated with the seasons and how day length varies.		Earth & Space Observe changes across the four seasons. Observe and describe weather associated with the seasons and how day length varies.		Earth & Space Observe changes across the four seasons. Observe and describe weather associated with the seasons and how day length varies.	
Year 2	Living Things & 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.		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.	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.

Year 3	Forces 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.	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.	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.	Materials 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.	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, protection, and movement.
Year 4	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.	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.	Materials 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).	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.	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

	Construct and interpret a variety of food chains, identifying producers, predators, and prey.	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.	Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.	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.	their local and wider environment. Recognise that environments can change and that this can sometimes pose dangers to living things.
Year 5	Earth & 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 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.	Materials Compare and group together everyday materials on the basis of their properties. Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood, and plastic. 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. 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.	Living Things & 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.	Animals Including Humans Describe the changes as humans develop to old age.

Year 6	Animals Including Humans	Living Things & Their Habitats	Light	Electricity	Evolution & Inheritance
	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.	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.	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.	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.	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.

Pupils will apply the Working Scientifically disciplinary skills (detailed below) throughout the academic year. The most pertinent skills have been identified clearly on the Teacher Knowledge Organiser for each lesson, to ensure coverage and explicit teaching of these takes place.

Whilst investigations will take place, in varying forms, throughout the year, in the Spring Term, pupils will have the opportunity to undertake a larger scale investigation based upon the National Curriculum KS1 and KS2 programmes of study. As they progress through the school, pupils will have the opportunity to apply the broad spectrum of working scientifically skills with increasing independence. In addition, pupils will develop their written communication skills during this term, as they explore age-appropriate scientific writing, preparing them suitably for their next stage of education.

PROGRESSION OF DISCIPLINARY SKILLS (WORKING SCIENTIFICALLY)

	EYFS	KS1	LKS2	UKS2
Ask Questions: Asking questions and recognising that they can be answered in different ways.	Show curiosity and ask questions.	Develop the ability to ask questions such as what something is, how things are similar and different, the ways things work, which alternative is better, how things change and how they happen. Where appropriate, answer these questions. Answer questions developed with the teacher through a scenario. Be involved in planning how to use resources provided to answer questions. Use different types of enquiries, to recognise that there are different ways in which questions can be answered.	Consider their prior knowledge when asking questions. Independently use a range of question stems. Where appropriate, they answer these questions. Answer questions posed by the teacher. Given a range of resources, decide for how to gather evidence to answer the question. Recognise when secondary sources can be used to answer questions that cannot be answered through practical work. Identify the type of enquiry to answer a question.	Independently ask scientific questions, stimulated by a scientific experience or to ask further questions to developed understanding following an enquiry. Given a wide range of resources decide for themselves how to gather evidence to answer a scientific question. Choose a type of enquiry to carry out and justify this choice. Recognise the need for control variables where necessary and identify these. Recognise how secondary sources can be used to answer questions that cannot be answered through practical work.
Enquiry: Engaging in practical enquiry to answer questions.	Identify, sort and group.	Use practical resources provided to gather evidence to answer questions generated by themselves or the teacher. With support carry out: tests to classify; comparative tests; pattern seeking enquiries; and make observations over time. Use their observations and testing to compare objects, materials and living things. Sort and group things, identifying their own criteria for sorting. Use simple secondary sources (such as identification sheets) to name living things.	Select from a range of practical resources to gather evidence to answer questions generated by themselves or the teacher. Follow a plan to carry out: observations and tests to classify; comparative and simple fair tests; observations over time; and pattern seeking.	Select from a range of practical resources to gather evidence to answer questions. Carry out fair tests, recognising and controlling variables. Decide what observations or measurements to make over time and for how long. Look for patterns and relationships using a suitable sample.

		Describe the characteristics used to identify a living thing.		
Observe: Making observations and taking measurements.	Make observations using their senses and simple equipment.	Make careful observations to support identification, comparison and noticing change. Use appropriate senses, aided by equipment such as magnifying glasses or digital microscopes, to make observations. Begin to take measurements, initially by comparisons, then using non-standard units.	Make systematic and careful observations. Use a range of equipment for measuring length, time, temperature, and capacity, for example: thermometers and data loggers. Use standard units for their measurements.	Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate. Select measuring equipment to give the most precise results, for example: ruler, tape measure or trundle wheel, force meter with a suitable scale. During an enquiry, make decisions, for example: take repeat readings (fair testing), increase the sample size (pattern seeking) OR adjust the observation period and frequency (observing over time), in order to get accurate data (closer to the true value). Check further secondary sources (researching) to check observations/measurements.
Record/Present: Recording and presenting evidence.	Record their observations by drawing, taking photographs, using sorting rings or boxes and, in Reception, on simple tick sheets.	Record observations, for example: using photographs, videos, drawings, labelled diagrams or in writing. Record measurements, for example: using prepared tables, pictograms, tally charts and block graphs. Classify using simple prepared tables and sorting rings.	With support, decide how to record and present evidence. Record observation, for example: using photographs, videos, pictures, labelled diagrams or writing. Record measurements on given templates (if required), for example: using tables, tally charts and bar charts. Record classifications, for example: using tables, Venn diagrams, Carroll diagrams. With support, present the	Decide how to record and present evidence. Record observations, for example: using annotated photographs, videos, labelled diagrams, observational drawings, labelled scientific diagrams or writing. Record measurements, for example: using tables, tally charts, bar charts, line graphs and scatter graphs. Record classifications, for example: using tables, Venn diagrams, Carroll diagrams and classification keys.

			same data in different ways in order to help with answering the question using scientific language.	Present the same data in different ways in order to help with answering the question, using scientific language.
Conclusions: Answering questions and concluding.	Make direct comparisons. Use their observations to help them to answer their questions.	Use experiences of the world around them to suggest appropriate answers to questions. With support, relate answer to evidence, for example: observations made, measurements taken, or information gained from secondary sources. Recognise 'biggest and smallest', 'best and worst' etc. from their data.	Answer own and others' questions based on observations made, measurements taken, or information gained from secondary sources. With support, check answers are consistent with evidence. Interpret data to generate simple comparative statements based on evidence. Begin to identify naturally occurring patterns and causal relationships. Use results to draw simple conclusions, make predictions for new values, suggest improvements, and raise further questions. Draw conclusions based on evidence and current subject knowledge.	Answer own and others' questions based on observations made, measurements taken, or information gained from secondary sources. Discuss whether other evidence e.g. from other groups, secondary sources, and own scientific understanding, supports or refutes their answer. Talk about how own scientific ideas change due to new evidence gathered. Talk about how new discoveries change scientific understanding. In conclusions: identify causal relationships and patterns in the natural world from evidence; identify results that do not fit the overall pattern; and explain findings using own subject knowledge.
Evaluation: Evaluating and raising further questions and predictions.		Ask further questions which can be answered by extending the same enquiry.	Identify ways in which adaptations may have been made to the method or how the enquiry would be done differently if repeated. Use evidence to suggest values for different items tested using the same method, for example: the distance travelled by a car on an additional surface. Following a scientific experience, ask further questions which can be answered by extending the same enquiry.	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. Identify any limitations that reduce the trust in their data. Use the scientific knowledge gained from enquiry work to make predictions that can be investigated using comparative and fair tests.

Communicate: Communicating their findings.	Talk about what they have done and found out.	Orally communicate findings to an audience, using appropriate scientific language.	Communicate findings to an audience both orally and in writing, using appropriate scientific language.	Communicate findings to an audience using relevant scientific language and illustrations.
--	---	--	--	---