

St Joseph's Primary School, Otley - Science Skills Progression, Knowledge and Vocabulary

Year	Planning and Predicting	Investigating and Observing	Recording, Analysing and Evaluating	Knowledge	Vocabulary
Year 1	<ul style="list-style-type: none"> Suggest what might happen. Suggest simple ways to test ideas. 	<ul style="list-style-type: none"> Make observations using appropriate senses. Explore using the five senses. Make simple comparisons and groupings. 	<ul style="list-style-type: none"> Communicate findings in simple ways. Collect evidence to try to answer a question. 	<ul style="list-style-type: none"> identify and name at least five common wild and garden plants, identify and name at least five deciduous and/or evergreen trees the structure of plants and trees e.g. roots, trunk, stem, flower, canopy 	Ever green, Deciduous Root Stem Flower Seed Canopy trunk fish, amphibians, reptiles, birds and mammals carnivores, herbivores and omnivores Nose, ear, mouth, hands, feet, torso, head, skull wood, plastic, glass, metal, water, and rock flexible, hard, soft, absorbs Season Autumn winter Spring summer
Year 1 Greater Depth	<ul style="list-style-type: none"> Organise a group of others to carry out an investigation/observation. 	<ul style="list-style-type: none"> Communicate observations orally, in drawing, labelling, simple writing and using ICT. 	<ul style="list-style-type: none"> Use charts to communicate findings. Explain whether what happened was what they expected. 	<ul style="list-style-type: none"> identify and name at least ten common animals including fish, amphibians, reptiles, birds and mammals identify and name at least five common animals that are carnivores, herbivores and omnivores the basic parts of the human body and say which part of the body is associated with each sense. what an object is made from the names of a variety of everyday materials, including wood, plastic, glass, metal, water, and rock and identify know the simple physical properties of a variety of everyday materials The name the four seasons and the key changes that occur 	

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Year 2	<ul style="list-style-type: none"> • With help, suggest some ideas and questions • Think about how to collect evidence. • Suggest what might happen. • Think about and discuss whether comparisons and tests are fair or unfair. 	<ul style="list-style-type: none"> • Make observations and comparisons using simple equipment, following simple instructions. • Use firsthand experience and, with help, simple information sources to answer questions. 	<ul style="list-style-type: none"> • Record findings in simple ways including tables, graphs etc. • Say whether what happened was what was expected. 	<ul style="list-style-type: none"> • the differences between things that are living, dead, and things that have never been alive • that most living things live in habitats to which they are suited • how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other • the name a variety of plants and animals in their habitats, including micro-habitats • how animals obtain their food from plants and other animals, using the idea of a simple food chain, • name different sources of food. 	Habitat Dead Alive Food chain Predator Prey source Light, air, water, Warmth Offspring Hygiene States Shapes suitability
Year 2 Greater Depth	<ul style="list-style-type: none"> • Choose own equipment which can be used and explain their choices. 	<ul style="list-style-type: none"> • Begin to recognise when a test or comparison is unfair. 	<ul style="list-style-type: none"> • Use comparative adjectives to explain patterns, e.g. bigger, smaller, greater, higher. 	What plants need to grow and stay healthy	
				<ul style="list-style-type: none"> • that animals, including humans, have offspring which grow into adults • the basic needs of animals, including humans, for survival (water, food and air) • the importance for humans of exercise, eating the right amounts of different types of food, and hygiene. 	
				<ul style="list-style-type: none"> • the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses • how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. 	

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Year 3	<ul style="list-style-type: none"> Respond to suggestions. With help put forward ideas about testing. Make predictions. With help, consider what constitutes a fair test. With help, plan and carry out a fair test. 	<ul style="list-style-type: none"> Make observations and comparisons. Measure length, volume of liquid and time in standard measures using simple measuring equipment. Use firsthand experience and simple information sources to answer questions. 	<ul style="list-style-type: none"> Communicate findings in a variety of ways. Say whether what happened was what was expected and draw simple conclusions. With help, identify simple patterns and suggest explanations. 	<ul style="list-style-type: none"> the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers 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 the way in which water is transported within plants the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. 	roots, stem/trunk, leaves and flowers air, light, water, nutrients transported life cycle pollination, seed formation seed dispersal. Nutrition Skeletons Muscles Protection Fossils Trapped Organic Absence Reflected Surfaces Opaque Transparent Translucent Magnetic Forces Attraction, attract, repel poles
Year 3 Greater Depth	<ul style="list-style-type: none"> Plan out how to perform a task, varying one factor while keeping others the same. 	<ul style="list-style-type: none"> Explain when a test or comparison is unfair. Show in the way they perform their tasks how to vary one factor while keeping others the same. 	<ul style="list-style-type: none"> Lead a group to communicate findings to the rest of the class, using a variety of resources. 	<ul style="list-style-type: none"> 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 that humans and some other animals have skeletons and muscles for support, protection and movement. 	
				<ul style="list-style-type: none"> simple terms, how fossils are formed when things that have lived are trapped within rock that soils are made from rocks and organic matter. 	
				<ul style="list-style-type: none"> that they need light in order to see things and that dark is the absence of light that light is reflected from surfaces that light from the sun can be dangerous and that there are ways to protect their eyes that shadows are formed when the light from a light source is blocked by a solid object 	
				<ul style="list-style-type: none"> That different things move differently on different surfaces that some forces need contact between two objects, but magnetic forces can act at a distance that magnets attract or repel each other and attract some materials and not others that some everyday materials that are attracted to a magnet, and identify some magnetic materials that magnets have two poles 	

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Year 4	<ul style="list-style-type: none"> Recognise why it is important to collect data to answer questions. Suggest questions that can be tested. Put forward ideas about testing and make predictions. With help, consider what constitutes a fair test. 	<ul style="list-style-type: none"> Make relevant observations and comparisons. Make measurements of temperature, time and force, as well as measurements of length. Begin to think about why measurements of length should be repeated. With help, carry out a fair test, recognising and explaining why it is fair. 	<ul style="list-style-type: none"> Explain what the evidence shows in a scientific way and whether it supports predictions. Suggest improvements in their work. 	<ul style="list-style-type: none"> that living things can be grouped in a variety of ways that classification keys help group, identify and name a variety of living things in their local and wider environment that environments can change and that this can sometimes pose dangers to living things. 	Classification Keys Digestion Stomach Acid Incisor, molar, premolar, canine Food chain Producer, prey, predator Solids, liquids, gases State Evaporation Condensation Vibration Pitch Volume Strength Appliance Circuit Cells, wires, bulbs, switches, buzzers Conductor, insulator
				<ul style="list-style-type: none"> the simple functions of the basic parts of the digestive system in humans the different types of teeth in humans and their simple functions that food chains vary and know what are producers, predators and prey. 	
Year 4 Greater Depth	<ul style="list-style-type: none"> Decide on an appropriate approach in their own investigations to answer questions. 	<ul style="list-style-type: none"> Explain which result should be chosen from a set of repeated results. 	<ul style="list-style-type: none"> Suggest improvements in their work, giving reasons. 	<ul style="list-style-type: none"> That materials, are solids, liquids or gases that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius ($^{\circ}\text{C}$) the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature. 	
				<ul style="list-style-type: none"> how sounds are made, associating some of them with something vibrating that vibrations from sounds travel through a medium to the ear that there are patterns between the pitch of a sound and features of the object that produced it that there are patterns between the volume of a sound and the strength of the vibrations that produced it that sounds get fainter as the distance from the sound source increases. 	
				<ul style="list-style-type: none"> Name at least 5 common appliances that run on electricity How to construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers 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 that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit some common conductors and insulators, and associate metals with being good conductors. 	

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Year 5	<ul style="list-style-type: none"> Recognise that scientific ideas are based on evidence and creative thinking. Make predictions based on scientific knowledge. Suggest methods of testing including a fair test. Suggest how to collect evidence. Select suitable equipment. 	<ul style="list-style-type: none"> Carry out a fair test, explaining why it is fair. Understand why observations and measurements need to be repeated. Select information from provided sources. 	<ul style="list-style-type: none"> Communicate findings in a variety of ways. Identify simple trends and patterns. Communicate findings in tables, bar charts and line graphs, whilst making appropriate use of ICT. Identify trends and patterns and offer explanations for these. Draw conclusions and communicate them in appropriate scientific language. Suggest improvements in their work, giving reasons. 	<ul style="list-style-type: none"> the differences in the life cycles of a mammal, an amphibian, an insect and a bird the life process of reproduction in some plants and animals. 	Life cycle Amphibian, reptile Reproduction Properties, transparency, conductivity, thermal, magnetic Dissolve, solution, mixture, separated, evaporation, Reversible, irreversible Axis, spherical, clockwise, anticlockwise, rotation Gravity Resistance, air resistance, water resistance, friction Mechanism, lever, pulley, gear, force
				<ul style="list-style-type: none"> describe the changes as humans develop to old age. The properties of everyday materials, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution how mixtures might be separated, including through filtering, sieving and evaporating that dissolving, mixing and changes of state are reversible changes 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. 	
Year 5 Greater Depth	<ul style="list-style-type: none"> Explain predictions in writing using scientific knowledge. 	<ul style="list-style-type: none"> Use averages to gain one representative result from a set of repeated results. 	<ul style="list-style-type: none"> Begin to explain anomalous data. Draw own bar and line graphs to represent results. 	<ul style="list-style-type: none"> the movement of the Earth, and other planets, relative to the Sun in the solar system the movement of the Moon relative to the Earth that the Sun, Earth and Moon are as approximately spherical bodies the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky. that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object the effects of air resistance, water resistance and friction, that act between moving surfaces that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect. 	

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Year 6	<ul style="list-style-type: none"> Consider how scientists have combined evidence from observation and measurement with creative thinking to suggest new ideas and explanations for phenomena. Make predictions based on scientific knowledge and understanding. Suggest methods of testing including a fair test and how to collect evidence, ensuring it is sufficient and appropriate. 	<ul style="list-style-type: none"> Carry out a fair test, identifying key factors to be considered. Make a variety of relevant observations and measurements using simple apparatus correctly. Decide when observations and measurements need to be checked, by repeating, to give more reliable data. Select information from a range of sources. 	<ul style="list-style-type: none"> Communicate findings in tables, bar charts and line graphs, whilst making appropriate use of ICT. Identify trends and patterns and results that do not appear to fit the pattern. Provide explanations for differences in observations and measurements. Draw conclusions and communicate them in appropriate scientific language. Make practical suggestions for improving methods in their work giving suggestions. 	<ul style="list-style-type: none"> 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 the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood the impact of diet, exercise, drugs and lifestyle on the way their bodies function the ways in which nutrients and water are transported within animals, including humans. 	Characteristics, micro-organisms Circulatory system, blood vessels, capillaries, aorta, veins Nutrients Fossils, adaptation, environment, evolution Reflect, reflection, reflecting, sources, shadows Circuit
Year 6 Greater Depth	<ul style="list-style-type: none"> Explain predictions in writing using scientific knowledge and understanding. 	<ul style="list-style-type: none"> Understand the difference in how to investigate quantitative and qualitative data. 	<ul style="list-style-type: none"> Explain anomalous data with a variety of reasons. Show how interpretation of evidence leads to new ideas. 	<ul style="list-style-type: none"> that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution. that light appears to travel in straight lines that objects are seen because they give out or reflect light into the eye that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes that light travels in straight lines to explain why shadows have the same shape as the objects that cast them. the recognised symbols when representing a simple circuit in a diagram. 	