Starcross Primary School - Science Progression

Learning for life

		Pre-school	Foundation	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Knowledge	Physics	explore and talk about different forces they can feel	know some similarities and differences between the natural world around them and contrasting environments draw on their experiences and what has been read in class can talk about and record features of the weather and seasons use books/ technology to find information	**Seasonal changes** Pupils should be taught to: observe changes across the 4 seasons observe and describe weather associated with the seasons and how day length varies		**Light** Pupils should be taught to: 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 **Forces and magnets** compare how things move on different surfaces notice that some forces need contact between 2 objects, but magnetic forces can act at a distance observe how magnets attract or repel each other and attract some materials and not others compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials describe magnets as having 2 poles predict whether 2 magnets will attract or repel each other, depending on which poles are facing	**Sound** Pupils should be taught to: 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 increases **Electricity** Pupils should be taught to: 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	**Forces** Pupils should be taught to: 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 **Earth and space** Pupils should be taught to: 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	**Light** Pupils should be taught to: 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 **Electricity** Pupils should be taught to: 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

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Knowledge	Chemistry 	use all their senses in hands-on exploration of natural materials explore collections of materials with similar and/or different properties talk about the differences between materials and changes they notice 	know about similarities and differences in relation to places, objects, materials and living things describes a range of different food textures and tastes when cooking and notices changes when they are combined or exposed to hot and cold temperatures understand some important processes and changes in the natural world around them, including the seasons and changing states of matter describe different materials and talk about what they would be useful for know about similarities and differences in relation to places, objects, materials and living things understand some important processes and changes in the natural world around them, including the seasons and changing states of matter 	**Everyday materials** Pupils should be taught to: 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 	**Uses of everyday materials** Pupils should be taught to: 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** Pupils should be taught to: 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** Pupils should be taught to: 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 	**Properties and changes of materials** Pupils should be taught to: 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 	

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Learning for life

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Knowledge	Biology	plant seeds and care for growing plants understand the key features of the life cycle of a plant and an animal	develop an understanding of growth, decay and changes over time show care and concern for living things and the environment know about similarities and differences in relation to places, objects, materials and living things makes observations of animals and plants and explains why some things occur, and talks about changes describe physical changes to the body that can occur when feeling unwell, anxious, tired, angry or sad explore the natural world around them, making observations and drawing pictures of animals and plants can follow instructions to plant a seed and knows how to care for plants talks about how their body responds to exercise name body parts and their function explore the natural world around them describe what they see, hear and feel whilst outside understand the effect of changing seasons on the natural world around them begin to understand the effect their behaviour can have on the environment talks about the features of their own immediate environment and how environments might vary from one another	**Plants** Pupils should be taught to: 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** Pupils should be taught to: 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	**Living things and their habitats** Pupils should be taught to: 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** Pupils should be taught to: 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** Pupils should be taught to: 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	**Plants** Pupils should be taught to: 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** Pupils should be taught to: 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	**Living things and their habitats** Pupils should be taught to: 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** Pupils should be taught to: 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** Pupils should be taught to: 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** Pupils should be taught to: describe the changes as humans develop to old age	**Living things and their habitats** Pupils should be taught to: 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** Pupils should be taught to: 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** Pupils should be taught to: 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

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Learning for life

		Pre-school Early learning goal foundations	Foundation Early learning goal foundations	Year 1 Developing simple enquiry skills	Year 2 Becoming more systematic and accurate	Year 3 Beginning to use fair testing and systematic enquiry	Year 4 Increasing accuracy and use of data	Year 5 Working more independently and interpreting data	Year 6 Greater independence and deeper reasoning
Working Scientifically	**Asking questions**	uses a variety of questions (e.g. what, where, who).	ask questions to find out more and to check they understand what has been said to them comment and ask questions about aspects of their familiar world such as the place where they live or the natural world make comments about what they have heard and ask questions to clarify their understanding	asking simple questions and recognising that they can be answered in different ways	asking simple questions and recognising that they can be answered in different ways Ask questions that can be explored through practical work.	asking relevant questions and suggest ways to find answers	asking increasingly focused questions that can be investigated	plan their own enquiries using scientific questions	independently plan enquiries that answer scientific questions choose the most appropriate type of enquiry
	Making predictions	understand 'why' questions, like: "Why do you think the caterpillar got so fat?"	use talk to help work out problems and organise thinking and activities explain how things work and why they might happen	Make simple predictions based on everyday experiences.	Make simple predictions and recognise if they were correct.	use results to make predictions for new values	use results to make predictions for new values	using test results to make predictions to set up further comparative and fair tests	using test results to make predictions to set up further comparative and fair tests
	Setting up tests	explore how things work	play and explore - investigate and experience things, and 'have a go' complete simple investigations with adult support use some scientific language	performing simple tests with support	performing simple comparative tests	setting up simple practical enquiries, comparative and fair tests Begin to identify variables that need to be kept the same	set up fair tests independently Begin to decide what to change, measure and keep the same.	plan and carry out fair tests identifying all key variables Understand and control variables when necessary explain why certain equipment is used	plan and conduct complex enquiries with controlled variables
	Observing and measuring	talk about what they see, using a wide vocabulary develop understanding of simple concepts (e.g. big/little) notice detailed features of objects in their environment	look closely at similarities, differences, patterns and change know about similarities and differences in relation to places, objects, materials and living things talk about the features of their own immediate environment and how environments might vary from one another describe physical changes to the body that can occur when feeling unwell, anxious, tired, angry or sad	observing closely, using simple equipment Group objects, materials and living things using simple features.	use simple scientific equipment accurately (e.g., hand lenses, egg timers). identifying and classifying sort things into simple categories and explain choices.	making systematic observations over time using simple measuring equipment, including thermometers and rulers, accurately identifying differences, similarities or changes related to simple scientific ideas and processes	Use a wide range of equipment, e.g. data loggers, accurately make repeated observations for reliability	taking measurements, using a range of scientific equipment, with increasing accuracy and precision	take measurements with increasing precision and accuracy understand the need for repeat readings and reliability

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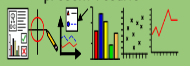
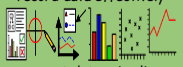
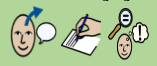
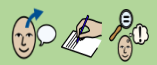
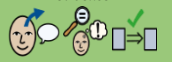
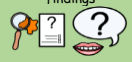
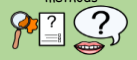
Working Scientifically	**Recording data**		describe a range of different food textures and tastes when cooking and notice changes when they are combined or exposed to hot and cold temperatures know information can be relayed through signs and symbols in various forms (e.g. printed materials, digital screens and environmental print)  Create sounds, movements, drawings to accompany stories	gathering and recording data to help in answering questions  draw or use simple tables to record what they see	gathering and recording data to help in answering questions  record findings using drawings, labelled diagrams, simple charts or tables.	recording findings using simple scientific language, drawings, labelled diagrams, and simple bar charts to present data 	recording findings using tables and graphs, including bar charts, to record and present results 	use line graphs and more complex tables to record and present results 	decide how to collect and record data effectively  present data using line graphs, bar charts and tables, choosing the best format
	Interpreting and communicating results	repeat actions that have an effect understand 'who', 'what', 'where' in simple questions (e.g. Who's that/can? What's that? Where is?) 	articulate ideas and thoughts in well-formed sentences engage in non-fiction books describe events in some detail can talk about some of the things they have observed such as plants, animals, natural and found objects talk about why things happen and how things work understand questions such as 'who; why; when; where and how' 	using their observations and ideas to suggest answers to questions  talk about what they did and what they noticed using simple scientific vocabulary	using their observations and ideas to suggest answers to questions  use scientific vocabulary to describe what happened and what it means	 communicate findings using scientific language 	explain findings and patterns in results 	draw conclusions based on evidence  identify patterns and explain them using scientific ideas	form detailed conclusions supported by evidence  explain causal relationships (not just correlations) use scientific vocabulary and abstract concepts confidently
	Evaluating	be able to express a point of view and to debate when they disagree with an adult or a friend, using words as well as actions 	listen to and talk about selected non-fiction to develop a deep familiarity with new knowledge and vocabulary make observations of animals and plants and explain why some things occur and talk about changes create and think critically - children have and develop their own ideas, make links between ideas and develop strategies for doing things 			using results to draw simple conclusions  using straightforward scientific evidence to answer questions or to support their findings 	suggest improvements to methods 	evaluate the reliability of results and suggest realistic improvements 	evaluate enquiry methods and consider how results could be improved or extended