Fairfields Primary School Science Progression in knowledge Map

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Plants	**In the Garden**	**Growing Plants**	**Investigating Plants**			
	Make observations of plants, including flowers and beans they have planted Identify the leaf, root, stem and flower of a plant Identify the trunk, branch, roots and leaves of a tree know that plants produce seeds Identify differences between plants **Identify and describe the basic structure of a variety of common flowering plants, including trees** Name some common plants name some plants that live in the garden Name some plants that live in the wild	Know that flowering plants produce seeds which grow into new plants Know that some plants have bulbs from which they grow Make observations of plants over time Explore how plants from seeds and bulbs grow Describe what happens to bulbs during the plant cycle as they grow Describe what happens to a seed as it grows and develops Describe what they observe as new plants grow **Observe and describe how seeds and bulbs grow into mature plants**	**Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers** Describe why healthy roots and a healthy stem are needed for plants to grow Recognise that plants need light, water and warmth and healthy leaves, roots and stems in order to grow well Know that water travels from the roots up the stem **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** Know that plants make their own food			

	Name some trees in the local environment Recognise that different plants live in the local environment Use simple identification guides to name plants in the local environment **identify and name a variety of common wild and garden plants, including deciduous and evergreen trees**	Suggest how to find out about what plants need in order to grow well Recognise that plants are living and need water, light and warmth to grow Describe differences between plants grown in the light and in the dark **Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy**	Understand that plants absorb minerals from the soil **Investigate the way in which water is transported within plants** Describe how the stem has a role in support and nutrition (transport of water) E**xplore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal**			

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Animals including humans	Different Animals	Growth and Survival	Healthy Eating and Healthy Bodies	Teeth and Digestion	Human Life Cycles	Humans and Health
	Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals Make observations of animals Know that animals eat different types of food Identify the food of some common animals recall and use the words: carnivore, herbivore and omnivore **Identify and name a variety of common animals that are carnivores, herbivores and omnivores** Use their observations to point out differences between humans and other animals and between animals and non-living things	Recognise that animals produce young **Notice that animals, including humans, have offspring which grow into adults** Recognise changes that take place as animals get older Explain that adult animals no longer grow describe some differences they observe between babies and toddler Make comparisons of the differences they observe between babies and toddlers Identify the offspring of a selection of different animals **Find out about and describe the basic needs of animals, including humans, for**	Identify some foods needed for a healthy and varied diet Name the components of a healthy and varied diet Describe how their diet is balanced **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** Know they have bones and muscles in their body State that they and other animals have skeletons Identify animals that do not have an internal skeleton (invertebrates)	Identify a wider range of body parts, including some internal organs (large intestine, small intestine, brain, lungs, heart, stomach, oesophagus) Locate and name the different organs in the digestive system Describe the role of each organ in the digestive system **Describe the simple functions of the basic parts of the digestive system in humans** Recognise they need to take care of their teeth Name the different types of teeth Describe the role of each type of teeth in digestion I**dentify the different types of teeth in humans and their simple functions**	D**escribe the changes as humans develop to old age** Recognise stages in growth and development of humans including puberty	Identify and name the parts of the circulatory system Know that the heart is made of muscle Describe what the heart and blood vessels do I**dentify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood** State how to measure pulse rate recognise that pulse rate is a measure of how fast the heart is beating Discover that during exercise the heart beats faster to take blood more rapidly to the muscles

	Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets) Identify and locate the sense organs use senses to Describe textures, sounds and smells compare differences in texture, sounds and smells Name and locate the basic parts of the human body	**survival (water, food and air)** **Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene** Recognise that exercise is important Name some types of food Identify some types of food that make up their diet and name some examples of each Recognise that an adequate diet and exercise are necessary for them to grow and stay healthy Describe some of the types of food that they eat	Group animals with and without an internal skeleton Describe some observable characteristics of bones Describe the main functions of their skeletons State that movement depends on both skeleton and muscles state that when one muscle contracts another relaxes **Identify that humans and some other animals have skeletons and muscles for support, protection and movement** Recognise that their skeletons grow as they grow	Explain how they should look after their teeth and recognise why they need to do so State that animals have different diets and may have different kinds of teeth		Make careful measurements of pulse rate Describe the different functions of the blood (e.g.transporting and protecting) Know that the blood comes from the heart in arteries and returns to the heart in veins Know that blood carries oxygen and other essential materials around the body Identify some of the harmful effects of smoking **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** Recognise that care needs to be taken with medicines and that they can be dangerous

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						Give several reasons why it is sometimes necessary to take medicines Identify some harmful effects of drugs Identify food as a fuel for the body Name the major groups into which food is categorised and identify sources for each group Describe the main function of organs of the human body

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Living Things and Their Habitats	Seasonal Changes	Habitats		Classification and Interdependence	Life Cycles	Classification/Evolution and Inheritance
	Observe changes across the four seasons Identify what to observe Use descriptive words, photos and pictures to record changes Collect evidence of changes (e.g.leaves, seeds, flowers) Name the four seasons Recall simple changes associated with each season Observe and name types of weather (e.g.rain, sun, wind, clouds) **Observe and describe weather associated with the seasons and how day length varies** Identify what to measure about the weather	With help, use keys to identify some animals and plants Recognise that different plants live in the local environment Identify some local habitats Describe the simple features of habitats Recognise a microhabitat as a small habitat (e.g.leaf litter, woodlice under stones) Describe some microhabitats **Identify and name a variety of plants and animals in their habitats, including micro-habitats** Recognise similarities and differences between plants and animals		**Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment** **Recognise that living things can be grouped in a variety of ways** Explore ways of grouping living things including animals and plants (flowering and non-flowering) Recognise that animals can be grouped into vertebrates and invertebrates Describe some of the characteristics of the vertebrate (fish, mammals, amphibians, reptiles and birds) groups (e.g.warm-blooded, have fur, lay eggs) Group animals into vertebrate (fish, mammals, amphibians,	Sequence the life cycles of a variety of plants and animals Recognise the similarities in the life cycles of plants, animals and humans Name the parts of a flower Describe the functions of some parts of a flower Describe the main functions of parts of a plant involved in reproduction Describe the processes of sexual and asexual reproduction in plants **Describe the life process of reproduction in some plants and animals** Know that most animals reproduce by sexual reproduction	Recognise that there is a wide variety of living things Understand why classification is important Identify vertebrates and invertebrates Name and describe the five vertebrate groups **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** Understand there are living things that are too small to be seen and these can affect our lives

	Use prepared tables and charts to record data	**Explore and compare the differences between things that are living, dead, and things that have never been alive** Explain differences between living and non-living things in terms of characteristics such as movement and growth Use their observations to point out differences between animals, plants and non-living things Recognise that plants provide food for humans and other animals within an environment Construct a simple food chain (e.g.grass, cow, human) **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**		reptiles and birds) and invertebrates groups (snails, slugs, spiders, worms and insects) Identify that some animals feed on other animals and some on plants Represent feeding relationships with simple food chains Recognise that a food chain must always start with a green plant (a producer) Represent feeding relationships within a habitat with food chains beginning with a green plant which 'produces' food for the other organisms Recognise that green plants are the ultimate source of food for all animals Use and understand the terms: producer, predator and prey		Recognise that there are many micro-organisms, some which can cause illness or decay Recognise that there are useful micro-organisms which can be used in food production Describe how micro-organisms feed, grow and reproduce like other organisms Describe evidence, from investigations, that yeast is living Recognise variation in different species (e.g.dogs, horses) Recognise that offspring have some of the features of their parents **Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents**

		Name a few of the organisms that live in a particular habitat Suggest reasons why different plants and animals are found in the different environments **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**		**Construct and interpret a variety of food chains, identifying producers, predators and prey** know the function of some of the more complex features which aid survival in specific habitats (e.g.gills, blubber, camouflage) Describe why different animals and plants live in different habitats **Recognise that environments can change and that this can sometimes pose dangers to living things** Describe how humans can cause changes to environments Explain that different organisms are found in different habitats because of differences in environmental factors		Recognise that animals have to compete for food Describe how animals avoid predators (e.g.speed, camouflage) Describe how animals and plants are adapted to their environments **Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution** Explain how being well adapted to an environment means an organism is more likely to survive **Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago**

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Materials	Everyday Materials	Uses of Every Day Materials	Rocks, Fossils and Soil	Solids, Liquids and Gases	Changes of Materials	
	Name some common materials name some common objects around the school and home **Distinguish between an object and the material from which it is made** Identify some naturally occurring materials: wood, rock, water Identify some man-made materials: glass, metal, plastic **Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock** Make observations of common objects and the different materials they are made of communicate these observations using descriptive words (e.g.bendy, rough, hard)	Identify uses of some common materials Give a reason why a material is suitable for its job Recognise that some materials will have more than one property which increases its suitability for its purpose (e.g.glass is transparent, rigid and weatherproof) **Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses** Suggest several reasons why a material may or may not be suitable for a particular purpose Identify materials that can be easily changed with force	Observe the characteristics of a variety of rocks Name and describe the characteristics of several rocks Classify rocks from the evidence of investigations Explain that rocks are used for different purposes dependent on their physical properties Explain that different types of rock react differently to physical forces (e.g.water, rubbing) **Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties** Understand that there are rocks under the Earths' surface	Name some solids and liquids State that air is a gas State some differences between solids, liquids and gases Recognise everyday substances as mixtures of solids, liquids and/or gases Recognise that air is a material and that it is one of a range of gases which have important uses Recognise that gases flow from place to place Know that gases can be easily compressed Describe the differences between solids and liquids Compares simple solids and liquids (e.g.in terms of ease of squashing or pouring)	Observe and explore the properties of materials (e.g.hardness, transparency, magnetism, electrical and thermal conductivity) Identify some materials that are good thermal insulators and some everyday uses of these Recognise that metals are both good thermal and good electrical conductors Suggest why particular materials are used for different jobs depending on their properties **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**	

	identify some properties of materials (e.g.see through, waterproof, absorbent) **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** (both visible and non-visible)	Identify materials that cannot be easily changed with force Describe pushes and pulls needed to change a material as big or small **Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching** Describe changes in shapes as a result of the action of pushes, pulls and twists	**Describe in simple terms how fossils are formed when things that have lived are trapped within rock** Recognise that soil is a mixture of different materials and living things Recognise that soil contains dead plants and animals Recognise that there is rock under all surfaces and that soils come from rocks **Recognise that soils are made from rocks and organic matter**	**Compare and group materials together, according to whether they are solids, liquids or gases** Observe what happens to a variety of materials when they are heated (e.g.chocolate, ice cream, butter, water) Identify a wide range of contexts in which changes of state take place describe a few examples where these changes occur Recognise that for a substance to be detected by smell, some of it must be in the gas state **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)**	**give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic** Recognise that salt or sugar dissolves in water but sand won't Name some materials that will and some that will not dissolve in water Recognise that although it is not possible to see a dissolved solid, it remains in the solution Describe melting and dissolving and give everyday examples of each Identify and explore factors that affect the rate at which a solid dissolves Recognise that an undissolved solid can be	

				identify the processes of melting, freezing, evaporation and condensation Describe what happens to water when it is heated and cooled Recognise that these processes can be reversed Describe how when ice melts it turns to liquid and how when water freezes it becomes ice Describe how these processes can be reversed Describe how liquids evaporate to form gases and how gases condense to form liquids Sequence the changes that happen in the water cycle Describe the water cycle in terms of these processes	separated from a liquid by filtering Recognise that a solid can be recovered from a solution by evaporation Describe some methods that are used to separate simple mixtures Explain that when solids dissolve they break up so small they can pass through the holes in the filter paper **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**	

				Explain the relationship between liquids and solids in terms of melting and freezing Explain the relationship between liquids and gases in terms of evaporation and condensation I**dentify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature** Know that temperature can affect the rate of evaporation or condensation Describe the effect of temperature on evaporation Explain how changing conditions affects processes such as evaporation and condensation Identify a range of contexts in which changes take place	Recognise that dissolving is a reversible change Recognise that some changes can be reversed and some cannot Recognise that changes of state are reversible **Demonstrate that dissolving, mixing and changes of state are reversible changes** Observe and explore a variety of chemical changes (e.g.burning) Identify whether some changes are reversible or not Recognise dissolving as reversible Classify some changes as reversible (*e.g. dissolving*) and others as irreversible (*e.g. burning*) Recognise that irreversible changes	

				(e.g.evaporation of puddles in the school playground or from clothes on a washing line, condensation in the bathroom)	often make new and useful materials Recognise the hazards of burning materials Describe what happens when acid and bicarbonate of soda are mixed E**xplain 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** Explain that in some cases the new materials made are gases and identify some evidence for the production of gases (e.g.vigorous bubbling)	

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Light and Sound			**Light and Shadows**	**Sound and Vibrations**		**Light**
			Name a number of light sources, including the sun Describe and compare some light sources State that light sources are seen when light from them enters the eyes R**ecognise that light from the sun can be dangerous and that there are ways to protect their eyes** Recognise that they cannot see in the dark Recognise that light travels from a source **Recognise that they need light in order to see things and that dark is the absence of light** Explain that places are dark because there is no light and a light source is needed to help us see in such places	Recognise and describe many sounds and sound sources state that they hear sounds through their ears Recognise that when sounds are generated by objects, something moves or vibrates **Identify how sounds are made, associating some of them with something vibrating** Identify what is vibrating in a range of musical instruments Generalise that sounds are produced when objects vibrate Describe how sounds are generated by specific objects suggest ways of producing sounds **Recognise that vibrations from sounds**		Explore how light travels using torches and periscopes R**ecognise that light appears to travel in straight lines** Describe reflection as light 'bouncing off' objects Understand that in order to be seen, all non-luminous objects must reflect light Diagrammatically represent light from sources and bouncing off reflective surface using arrows E**xplain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes** Draw diagrams to illustrate how light is

			Notice that light is reflected from surfaces State that reflections can be seen in shiny surfaces Identify suitable reflective clothing for travelling in the dark Explain that they cannot see shiny objects in the dark because there are no light sources Recognise that when light is blocked, a shadow is formed **Recognise that shadows are formed when the light from a light source is blocked by a solid object** Recognise that shadows are similar in shape to the objects forming them Make observations of changes in shadows	**travel through a medium to the ear** Distinguish between pitch and volume (loudness) Describe differences in pitch and volume **Find patterns between the pitch of a sound and features of the object that produced it** Know that altering vibrations alters the pitch or volume Explore how to vary the pitch and volume of sounds from a variety of objects or instruments **Find patterns between the volume of a sound and the strength of the vibrations that produced it** Suggest how to change the loudness of the sounds produced by a range of musical instruments		travelling from the source to the eye U**se the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye** Describe a variety of ways of changing the size of the shadow produced by an object Describe the relationship between the size of a shadow and the distance between the light source and an object **Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them**

			Explain that shadows are formed when light from a source is blocked State that even transparent objects block some light and form shadows Describe the difference in shadows cast by opaque, translucent and transparent materials Explore how to make shadows of different shapes and sizes **Find patterns in the way that the size of shadows change**	**Recognise that sounds get fainter as the distance from the sound source increases** Describe what they observe when they move further away from a source of sound		

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Forces			**Forces and Magnets**		**Earth and Space /Forces**	
			Recognise that pushes and pulls are forces Recognise that a force acts in a particular direction Observe the movements, shape and direction of objects when forces act on them Describe how to make a familiar object start moving by pushing or pulling Describe how to use pushes and pulls to make familiar objects speed up, slow down, change direction or shape Identify friction as a force Observe and explore how friction affects the movement of objects Describe some ways in which friction between		Identify and name the components of the solar system (i.e.Sun, Moon, Earth and other planets) Locate the Sun, Earth and other planets in the solar system Recognise that the Earth and other planets orbit the Sun Recall that the Earth takes one year to orbit the Sun Recall that the Earth rotates on its' axis and this takes one day **Describe the movement of the Earth, and other planets, relative to the Sun in the solar system** Recognise that the Moon orbits the Earth D**escribe the movement of the Moon relative to the Earth**	

			solid surfaces can be increased or decreased **Compare how things move on different surfaces** **Observe how magnets attract or repel each other and attract some materials and not others** Classify materials as magnetic or non-magnetic **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 the difference between a magnet and a magnetic material **Notice that some forces need contact between two objects, but magnetic forces can act at a distance**		**Describe the Sun, Earth and Moon as approximately spherical bodies** Recognise that the Earth, Sun and Moon are spherical and support this with some evidence Recognise that it is daylight in the part of the Earth facing the Sun Recall that a shadow from the Sun changes over the course of a day Explain in terms of the rotation of the Earth why shadows change and the Sun appears to move across the sky during the course of the day U**se the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky**	

			Describe what happens when some materials are put near a magnet Recall that magnets have a north and a south pole **Describe magnets as having two poles** Describe the direction of forces between magnets **Predict whether two magnets will attract or repel each other, depending on which poles are facing**		Explain why it is night time in Australia when it is day time in England **<u>Forces</u>** Identify weight as a force Identify that force is measured in Newtons Name simple forces such as gravity, friction and air resistance Recognise that more than one force can act on an object Draw force diagrams with arrows showing the direction of forces acting on an object Observe and explore the effect of several forces on objects Recognise that air resistance slows things down Recognise that friction can be useful or not useful	

					I**dentify the effects of air resistance, water resistance and friction, that act between moving surfaces** Describe some situations in which there is more than once force acting on an object Describe and explain the motion of some familiar objects in terms of several forces acting on them Explain that unbalanced forces on an object cause it to speed up, change shape or slow down E**xplain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object** Understand that air resistance is the force of	

					air on objects moving through it Describe some of the factors that increase friction between solid surfaces and increase air and water resistance Describe situations in which frictional forces are helpful as well as those in which frictional forces are unhelpful Explore the effects of levers, pulleys and gears R**ecognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect**	

Electricity				Circuits and Components		Electricity
				Identify common appliances that run on electricity Identify mains operated and battery operated devices Describe some of the dangers associated with mains electricity Name some components of a simple electrical circuit Know that batteries are sources of electricity Recognise that for a circuit to work it must be complete Construct a working circuit **Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers**		Know that the 'amount' of electricity (voltage) depends on the number of batteries with specified components Recognise conventional circuit symbols **Use recognised symbols when representing a simple circuit in a diagram** Draw circuit diagrams and construct circuits from diagrams using conventional symbols Explore how to change the brightness of bulbs and the volume of a buzzer Describe ways of changing the brightness of a bulb in a circuit or the volume of a buzzer Compare different circuits (e.g. for brightness of bulb)

				Make drawings of simple working circuits (pictorial only circuit symbols covered in year 6) Make circuits from drawings provided **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** Describe the effect of making and breaking one of the contacts on a circuit Explain why some circuits work and others do not **Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit** Describe how switches work		Recall that the amount of electricity is measured in voltage **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**

				Construct a home-made switch Identify materials as conductors or insulators Construct simple circuits and use them to test whether materials are electrical conductors or insulators R**ecognise some common conductors and insulators, and associate metals with being good conductors**		