



Farlow C. of E. Primary School Scientific knowledge progression map



Our science curriculum ensures that all areas of science are taught across all year groups on a two year rotation. This ensures that children revisit ideas and build up their understanding in each area of science as they progress through the school. As children move into class 2 they carry out more complex investigations and different types of investigations eg investigations over time. Children in Reception learn through play and exploration and this carries on into Key Stage 1. By Year 2, children are beginning to carry out fair tests with two variables. They also learn how to write an accurate prediction and draw simple explanations and diagrams. They are taught how to ensure their investigations are accurate. This is built upon in Key Stage 2. Investigations in years 5 and 6 are more complex than in years 3 and 4 to ensure the children are extending their knowledge and understanding. Children are encouraged to be scientists and to find answers to their questions. They are introduced to the work and ideas of famous scientists.

Reception	Key Stage 1	Years 3 and 4	Years 5 and 6
Animals including humans			
Children in Reception follow an Early Years curriculum based on discovery and exploration. Science forms part of the Understanding the World area of learning and particularly the "World" strand of the EYFS curriculum. Children are working towards the following Early Learning Goal: <ul style="list-style-type: none"> Children know about similarities and 	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> describe the changes as humans develop to old age. 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

<p>differences in relation to living things. They talk about the features of their own immediate environment and how environments might vary from one another. They make observations of animals and plants and explain why some things occur, and talk about changes.</p>	<p>and mammals, including pets)</p> <ul style="list-style-type: none"> • identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense • know 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. 	<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • describe the ways in which nutrients and water are transported within animals, including humans
<p>Living things and their habitats/evolution</p>			
<ul style="list-style-type: none"> • Children make observations of animals and plants and explain why some things occur, and talk about changes. • Children explore and talk about familiar environments eg school, 	<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • 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

<p>home, forest school. They learn about the plants and creatures that live around school and in our forest area.</p>	<p>describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other</p> <ul style="list-style-type: none"> • 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. 	<p>their local and wider environment</p> <ul style="list-style-type: none"> • recognise that environments can change and that this can sometimes pose dangers to living things. 	<ul style="list-style-type: none"> • 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 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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Materials	Everyday materials and their uses.	Magnets and states of matter/rocks and soils	Properties and changes of materials
<ul style="list-style-type: none"> • Children know about similarities and differences in relation to objects and materials. • They explore textures and properties of materials through practical, play-based activities. 	<ul style="list-style-type: none"> • 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 • 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 	<ul style="list-style-type: none"> • 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 and predict whether two magnets will attract or repel each other, depending on which poles are facing • compare and group materials together, according to whether they are solids, liquids or gases 	<ul style="list-style-type: none"> • 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

	<p>squashing, bending, twisting and stretching</p> <ul style="list-style-type: none"> Find out about people who have developed useful new materials, such as John Dunlop, Charles Macintosh, John McAdam 	<ul style="list-style-type: none"> 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 ($^{\circ}\text{C}$) identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature 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 	<p>changes of state are reversible changes</p> <ul style="list-style-type: none"> explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible find out about new chemists eg Spencer Silver, who invented sticky notes and Ruth Benerito, who invented wrinkle free cotton
Plants			
<ul style="list-style-type: none"> explore the local environment and forest 	<ul style="list-style-type: none"> identify and name a variety of common wild 	<ul style="list-style-type: none"> identify and describe the functions of different 	<ul style="list-style-type: none"> Revisit lower KS 2 understand photosynthesis

<p>school and look carefully at the plants in the environment</p> <ul style="list-style-type: none"> • begin to name some common plants including flowers, trees and shrubs • learn how to respect plants and that we must look after them and not pick wild flowers • plant seeds and find out how they change as they grow 	<p>and garden plants, including deciduous and evergreen trees identify and describe the basic structure of a variety of common flowering plants, including trees</p> <ul style="list-style-type: none"> • 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 	<p>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</p> <ul style="list-style-type: none"> • explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal 	
Light			
<ul style="list-style-type: none"> • talk about things that give us light. • explore light and dark through play and using different light sources eg torches 	<ul style="list-style-type: none"> • look at light sources and identify different light sources at home and at school • explore how light travels • explore what happens when light is blocked and find out about shadows • talk about the sun as a light source 	<ul style="list-style-type: none"> • revisit KS 1 plus: • 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 	<ul style="list-style-type: none"> • revisit lower KS2 plus: • 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 light or reflect light into the eye

		<ul style="list-style-type: none"> • recognise that shadows are formed when the light from a light source is blocked by a solid object • find patterns in the way that the size of shadows change 	<ul style="list-style-type: none"> • use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them • find out about how our eyes help us to see. • 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 • explore reflection using mirrors, linking to work on angles in mathematics • explore the work of scientists who work, or have worked, on light eg Isaac Newton
Electricity			
<ul style="list-style-type: none"> • find out about how things work and finding things that we plug in and things that are battery operated • play with a range of toys and beebots which are powered by batteries 	<ul style="list-style-type: none"> • explore familiar surroundings and look for things that run on electricity • think about keeping safe by electrical appliances 	<ul style="list-style-type: none"> • identify common appliances that run on electricity • construct a simple series electrical circuit, identifying and naming its basic parts, including cells, 	<ul style="list-style-type: none"> • 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

<ul style="list-style-type: none"> talk about what happens when you have played with the laptop/beebot for a long time 	<p>and when flying kites etc near pylons</p> <ul style="list-style-type: none"> explore how to make a simple circuit with a bulb or buzzer 	<p>wires, bulbs, switches and buzzers</p> <ul style="list-style-type: none"> 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 	<p>components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches</p> <ul style="list-style-type: none"> use recognised symbols when representing a simple circuit in a diagram find out about the scientific processes used by scientists in the field of electricity eg Thomas Edison, Joseph Swan and Michael Faraday
Forces			
<ul style="list-style-type: none"> explore pushes and pulls in play-based contexts eg playing with balls and wheeled vehicles and toys 	<ul style="list-style-type: none"> explore how we can make things move by pushing them find out what happens if we push things harder or less hard explore how we can pull things to make them move 	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> 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,

	<ul style="list-style-type: none"> • explore what happens when we put things on a ramp and push them 	<p>other and attract some materials and not others</p> <ul style="list-style-type: none"> • 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 	<p>that act between moving surfaces</p> <ul style="list-style-type: none"> • recognise that some mechanisms including levers, pulleys and gears allow a smaller force to have a greater effect. • Find out how scientists such as Galileo Galilei and Isaac Newton helped to develop the theory of gravitation.
Sound			
<ul style="list-style-type: none"> • explore a range of instruments and find different ways to make sounds through play-based activities 	<ul style="list-style-type: none"> • find different ways to make sounds by using body percussion • explore how different instruments make sound • experiment with ways to make sounds louder or softer • begin to understand that vibrations cause sounds 	<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • As lower KS2 • Study the work of Alexander Graham Bell

		<ul style="list-style-type: none"> • 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 	
Earth and space			
<ul style="list-style-type: none"> • talk about space and explore ideas through a range of stories and play based activities such as role play and art activities 	<ul style="list-style-type: none"> • think about the Earth and link to work in geography about the continents and oceans • start to learn about the planets in our solar system and which ones are nearest/furthest way from, the sun • think about the moon and the stars we can see in the night sky 	<ul style="list-style-type: none"> • Revisit learning in KS1 	<ul style="list-style-type: none"> • 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
Evolution			
<ul style="list-style-type: none"> • 	<ul style="list-style-type: none"> • 	<ul style="list-style-type: none"> • 	<ul style="list-style-type: none"> • recognise that living things have changed over time and that fossils provide information about

			<p>living things that inhabited the Earth millions of years ago</p> <ul style="list-style-type: none">• 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• work of naturalists such as David Attenborough and Jane Goodall.• Work of palientologists eg Mary Anning• Explore how Charles Darwin and Alfred Wallace developed their ideas on evolution
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