



Laughton Junior & Infant School

Learning together, achieving together

Science Skills Progression



	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
National Curriculum	Plants					
<p>Plants (KS1) <i>Pupils should be taught to:</i></p> <p><i>Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees.</i></p> <p><i>Identify and describe the basic structure of a variety of common flowering plants, including trees.</i></p> <p>Observe and describe how seeds and bulbs grow into mature plants.</p> <p>Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.</p> <p>Plants (KS2)</p> <p>identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers.</p> <p>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.</p> <p>Investigate the way in which water is transported within plants.</p> <p>Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.</p>	<p>To know where do plants come from.</p> <p>What plants need for plant survival.</p> <p>How plants get what they need to survive.</p>	<p>To know that all flowering plants make seeds that can grow in to new plants.</p> <p>Sometimes the plant dies after it has produced its seed and sometimes the plant lives for many generations producing seeds each year.</p>	<p>Flowering plants have evolved specific parts to carry out pollination, fertilisation and seed growth. Coloured and scented petals and attract insects Stamen hold pollen Stigma collect pollen Ovaries contain eggs that grow into seeds when pollen from the male moves down the stigma.</p> <p>All flowering plants reproduce by pollen from the male reaching the stigma of the female. However, all plants look slightly different because they pollinate in different ways. Most plants use insects to pollinate and so have colourful petals and strong scents, a few plants use the wind, these often have less colourful petals and little scent.</p> <p>Plants have evolved many different ways to disperse their seeds. Seed dispersal increase the chances of the seeds germinating and growing into mature plants.</p> <p>Seeds and bulbs need the right conditions to germinate. They contain a food store for the first stages of growth (i.e. until the plant is able to produce its own food through its leaves)</p>			

			Plants don't eat and so have to make their own food to provide them with energy and material to grow.			
<p>KS1 Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals.</p> <p>Identify and name a variety of common animals that are carnivores, herbivores and omnivores.</p> <p>Notice that animals, including humans, have offspring which grow into adults.</p> <p>Find out about and describe the basic needs of animals, including humans, for survival (water, food and air)</p> <p>Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.</p> <p>KS2 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.</p> <p>Identify that humans and some other animals have skeletons and muscles for support, protection and movement.</p> <p>Describe the simple functions of the basic parts of the digestive system in humans.</p> <p>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.</p> <p>Describe the changes as humans develop to old age.</p>	<p>Animals need food to survive; it gives them energy to move and material to grow.</p> <p>Animals are all different and so eat different foods, some eat other animals (carnivores) and others only eat vegetables (herbivores).</p> <p>Animals have to get their food so they have to move to where it is, which means they have to move in different ways depending upon where their food is.</p> <p>Animals that eat other animals have to hunt them (predators) animals that are hunted are prey.</p> <p>Animals use their senses to detect where their food is and if there are any predators around.</p> <p>Animals have different ways of avoiding being eaten e.g. camouflage, protection and moving away fast.</p>	<p>All animals are born which is when they can eat and breath.</p> <p>They grow and develop until they are strong enough to reproduce.</p> <p>When animals are no longer able to reproduce they usually die.</p> <p>Different animals live for different ages.</p> <p>Different animals reach different sizes before they are able to reproduce.</p> <p>Different animals reproduce at different ages.</p>	<p>All vertebrates have internal skeletons that protect vital organs.</p> <p>Invertebrates have exoskeletons that protect vital organs.</p> <p>Skeletons support the weight of land animals. Stronger bones can support more weight.</p> <p>Bones are connected (but can move relative to each other) at joints.</p> <p>Muscles connect to bones and move them when they contract. Stronger bones can anchor stronger muscle.</p>	<p>Animals need a variety of foods to help them grow and survive. The main food groups are:</p> <p>Meat, dairy and pulses to provide protein for muscles. Grains and root vegetables to provide carbohydrates for energy. Fat for insulation and energy. Fruit and vegetables for minerals, vitamins and fibre. These are essential to keep our bodies working well and protect us from illnesses.</p> <p>Different animals require different foods to survive.</p> <p>Humans require a balanced diet to remain healthy but healthy diets vary depending upon the type of activity that humans do.</p> <p>The nutrients in food have to get to every part of the body. The blood transports them. The role of digestion is to get the nutrients in food to dissolve in the blood, if it doesn't dissolve it can't enter the blood and be transported</p>	<p>What do humans look like?</p> <p>Humans have characteristics that are similar.</p> <p>There are differences amongst people</p> <p>How do humans change?</p> <p>Humans are smaller versions of their adult self.</p> <p>Humans have different stages of life.</p> <p>The stages last for different periods until they are adult.</p> <p>Lifecycles have similarities and differences.</p> <p>Mammals have similar lifecycles.</p> <p>Amphibians have a process of metamorphosis.</p> <p>Plant lifecycles. Plants reproduce in different ways.</p> <p>A plant life cycle is dependent on pollinators.</p> <p>Bulbs reproduce asexually.</p>	<p>All animals need oxygen to survive.</p> <p>Air is breathed into the lungs where the oxygen in the air is passed into the blood.</p> <p>Every part of animals bodies need oxygen, especially muscles</p> <p>Muscles need a supply of oxygen and sugar to make them work, they are supplied this by the blood.</p> <p>The blood circulates around the body in a way that ensures all muscles in the body get a supply of oxygen and sugar.</p> <p>The heart pumps blood to every muscle in the body. The circulatory route must allow the blood to collect oxygen from the lungs, sugar from the intestines and visit muscles.</p>

<p>Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood.</p> <p>Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function.</p> <p>Describe the ways in which nutrients and water are transported within animals, including humans.</p>						
<p>KS1</p> <p><i>Explore and compare the differences between things that are living, dead, and things that have never been alive.</i></p> <p><i>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.</i></p> <p><i>Identify and name a variety of plants and animals in their habitats, including microhabitats.</i></p> <p><i>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.</i></p> <p>KS2</p> <p><i>Recognise that living things can be grouped in a variety of ways.</i></p> <p><i>Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment.</i></p> <p><i>Recognise that environments can change and that this can sometimes pose dangers to living things.</i></p> <p><i>Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird.</i></p> <p><i>Describe the life process of reproduction in some plants and animals.</i></p>		<p>All animals get their nutrients by eating. Some animals hunt and eat other animals (predators) and some animals are hunted and eaten by other animals (prey).</p> <p>Animals that eat only other animals are called carnivores. Animals that only eat plants are called herbivores, and animals that eat both animals and plants are called omnivores</p> <p>All animals are adapted to eat and survive (they are adapted to survive as predators and prey).</p> <p>Animals have adapted many different ways to survive as predators or prey. Plants are also adapted to survive; they have adapted to get the water and light they need and avoid being eaten or dying when chewed.</p> <p>The changing seasons have a dramatic effect on plants, which has an impact on the animals that feed on them. Animals have adapted ways of surviving when the seasons change and food become scarce including hibernating, storing food (fattening up), migrating.</p> <p>Children should raise and explore questions that</p>		<p>In any habitat there are food chains and webs where nutrients are passed from one organism to another when it is eaten. If the population of one organism in the chain or web is affected it has a knock on effect to all the others.</p> <p>Environmental change (the seasons, human activity, climate change) affects different organisms differently and therefore different habitats differently because all organisms in a habitat are interdependent.</p> <p>Identify and classify creatures and plants in their local environment.</p>	<p>All living things have a lifecycle. These lifecycles are different.</p> <p>Learn about the changes experienced in puberty.</p> <p>Lifecycles have similarities and differences.</p> <p>Plant lifecycles. Plants reproduce in different ways.</p> <p>A plant life cycle is dependent on pollinators.</p> <p>Bulbs reproduce asexually.</p> <p>Pupils need to consider how changes to habitats affect the organisms within them.</p> <p>Pupils need to consider how humans can affect the local environment through pollution, building, new planting (planting a bush next to a pond), introducing or removing certain organisms (eg fencing rabbits out from the school field).</p>	<p>Animals can be classified in different ways. The classification of living things is complex and based upon genetic similarities. Important classifications are plants and animals (and vertebrates, invertebrates and mammals, birds, reptiles, amphibians and insects)</p> <p>Variation exists within these classifications. Children need to develop a rich understanding of variation through studying their environment and then asking questions about environments and organisms that they may have never seen before.</p> <p>Animals adapt to fit their habitat Those that adapted best survived.</p> <p>Understand that not everything that once lived is still living today.</p>

<p><i>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.</i></p> <p><i>Give reasons for classifying plants and animals based on specific characteristics.</i></p>		<p>demand the identification of creatures and plants in their local environment and how their populations change through the seasons. Linking the properties of the seasons to the changing populations and beginning to question how populations of different organisms are related.</p>				
<p>KS2</p> <p><i>Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago.</i></p> <p><i>Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents.</i></p> <p><i>Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.</i></p>						<p>Over the last many millions of years there are many examples of organisms becoming extinct and others evolving into new organisms over many generations.</p> <p>The fossil record provides evidence for this.</p> <p>Darwin's theory of Natural Selection explains how evolution occurs.</p> <p>Some organisms reproduce sexually where offspring inherit information from both parents, others reproduce asexually by making a copy of a single parent. A sexual reproduction results in little variation in a population that makes evolution less likely</p> <p>All living things have similar stages of life.</p>
<p>KS1</p> <p><i>Distinguish between an object and the material from which it is made.</i></p> <p><i>Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock.</i></p> <p><i>Describe the simple physical properties of a variety of everyday materials.</i></p> <p><i>Compare and group together a variety of everyday materials on the basis of their simple physical properties.</i></p>	<p>There are many different materials that have different describable and measureable properties.</p> <p>Materials that have similar properties are grouped into metals, rocks, fabrics, wood, plastic and ceramics (including glass).</p> <p>The properties of a material determine whether they are suitable for a purpose.</p>	<p>These ideas are explored through testing materials to see if they are appropriate for particular jobs.</p> <p>Topics need to be arranged so that all the main groups of materials are explored and important properties are investigated (strength, flexibility, waterproofness, absorbency, softness, slippiness, stretchiness, brittleness)</p>	<p>There are different types of rock.</p> <p>There are different types of soil.</p> <p>Soils change over time.</p> <p>Different plants grow in different soils.</p> <p>Fossils tell us what has happened before. Fossils provide evidence.</p> <p>Palaeontologists use Fossils to find out about the past.</p>	<p>Materials can be divided into solids liquids and gases. Solids hold their shape unless forced to change. Liquids flow easily but stay in their container because of gravity. The more viscous a liquid the less runny it is. Gases move everywhere and are not held in containers by gravity.</p> <p>Heating causes solids to melt into liquids and liquids to evaporate to gases.</p>	<p>It is possible to change materials into completely different ones. This is very important because new substances might have different properties to materials we currently have. For example, plastics can be moulded into intricate shapes, are waterproof, strong and electrical insulators.</p> <p>When materials are heated or mixed with other materials they sometimes</p>	

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.

KS2

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.

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.

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.

Cooling causes gases to condense to liquids and liquids to freeze to solids.

Different substance change state at different temperatures but the temperatures at which given substances change state are always the same.

The temperature at which a substance melts from a solid to a liquid is the same at which it freezes from a liquid to a solid.

The temperature at which a substance boils from a liquid to a gas is the same at which it condenses from a gas to a liquid.

Liquids evaporate slowly, even below their boiling temperatures.

When more than one substance are present in the same container it is called a mixture.

When a substance is added to a liquid it has dissolved if no bits of the substance can be seen and the liquid is transparent. This mixture is called a solution. Not all substances dissolve in water.

All mixtures can be separated if they have a difference in property. This is because both (or all) of the materials are still present.

can be made to turn into new materials.

Indicators that something new has been made are: 1. The properties of the material are different (colour, state, texture, hardness, smell, temperature) If it is not possible to get the material back easily it is likely that it is not there anymore and something new has been made (irreversible change).

<p><i>Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating.</i></p> <p><i>Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic.</i></p> <p><i>Demonstrate that dissolving, mixing and changes of state are reversible changes.</i></p> <p><i>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.</i></p>						
<p>KS2</p> <p><i>Compare how things move on different surfaces.</i></p> <p><i>Notice that some forces need contact between two objects, but magnetic forces can act at a distance.</i></p> <p><i>Observe how magnets attract or repel each other and attract some materials and not others.</i></p> <p><i>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.</i></p> <p><i>Describe magnets as having two poles.</i></p> <p><i>Predict whether two magnets will attract or repel each other, depending on which poles are facing.</i></p> <p><i>Describe the movement of the Earth, and other planets, relative to the Sun in the solar system.</i></p> <p><i>Describe the movement of the Moon relative to the Earth.</i></p>		<p>Objects move in different ways; they roll, slide, bounce etc.</p> <p>We can change the way an object moves by pushing or pulling them. Sometimes pushing and pulling slows things down, sometimes it speeds them up and sometimes it makes it change direction.</p> <p>Bigger pushes and pulls have bigger effects. (They change how things move more).</p> <p>Sometimes when an object is pushed, pulled or twisted it changes shape.</p>	<p>Magnets exert attractive forces on some metals.</p> <p>Magnetic forces work through other materials including air, so magnets don't need to be touching to exert their force. It is called a non-contact force.</p> <p>Each end of a magnet is called a pole, opposite poles are called north and south. Magnets exert attractive forces on each other when the poles facing each other are north and south (opposites). Magnets exert repulsive forces on each other when the poles facing each other are the same.</p> <p>The strength of magnetic forces are affected by: The strength of the magnet. The distance between the magnet and the object. The material the object is made from.</p>		<p>When objects move through air and water they have to push it out of the way. The water and air push back with forces called water resistance and air resistance. The harder it is to push the material out of the way the greater the resistance.</p> <p>Gases weigh less than liquids and so water resistance is greater than air resistance.</p> <p>Friction is a force against motion caused by two surfaces rubbing against each other. It occurs because no surfaces are perfectly smooth; they have bumps and undulations that can interlock when placed on top of each other.</p> <p>Some objects require large forces to make them move; gears, pulley and levers can reduce the force needed to make things move.</p> <p>The universe is vast and contains billions of stars. The solar system is a collection of planets and moons orbiting our nearest</p>	

<p><i>Describe the Sun, Earth and Moon as approximately spherical bodies.</i></p> <p><i>Use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.</i></p> <p><i>Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object.</i></p> <p><i>Identify the effects of air resistance, water resistance and friction, that act between moving surfaces.</i></p> <p><i>Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.</i></p>					<p>star, the sun. It can be represented using a model.</p> <p>Stars produce vast amounts of heat and light. All other objects are lumps of rock, metal or ice and can be seen because they reflect the light of star.</p> <p>Gravity is a force of attraction between any two things that have mass and bigger masses exert bigger forces.</p> <p>Gravity works over a distance but gets weaker as the distance increases. Stars, planets and moons have so much mass they exert a large gravitational attraction on other things, including each other.</p> <p>Differences in gravity result in smaller mass objects like planets (or moons) orbiting larger mass objects like stars (or planets)</p>	
<p>KS1</p> <p><i>Observe changes across the four seasons.</i></p> <p><i>Observe and describe weather associated with the seasons and how day length varies.</i></p> <p>KS2</p> <p><i>Recognise that they need light in order to see things and that dark is the absence of light.</i></p> <p><i>Notice that light is reflected from surfaces.</i></p> <p><i>Recognise that light from the sun can be dangerous and that there are ways to protect their eyes.</i></p> <p><i>Recognise that shadows are formed when the light from a light source is blocked by an opaque object.</i></p>	<p>Children should carry out a study of the environment over the entire year. This should be carried out in both Year 1 and 2 to embed the ideas of change.</p> <p>Children should draw conclusions from what they find and make suggestions for how they expect things to change.</p> <p>In tracking temperature and rainfall, pupils can make suggestions for why certain things happen and certain times in the year. Tipping points of temperature are vital as two-degree change can impact a wide range of organisms meaning they are no longer visibly present in the local area.</p>	<p>Children should carry out a study of the environment over the entire year. This should be carried out in both Year 1 and 2 to embed the ideas of change.</p> <p>Children should draw conclusions from what they find and make suggestions for how they expect things to change.</p> <p>In tracking temperature and rainfall, pupils can make suggestions for why certain things happen and certain times in the year. Tipping points of temperature are vital as two-degree change can impact a wide range of organisms meaning they are no longer visibly present in the local area.</p>	<p>We can only see things when there is light and the light had to come from somewhere. All light originally comes from a light source.</p> <p>When light hits an object it can do a number of things. If the object is transparent it will go through it and we will be able to see through it. If the object is opaque, it will block the light and no light will get through. If the object is perfectly reflective light will bounce back off it and we will see reflections of objects. If the material is translucent it will allow light through but we won't be able to see through it.</p>	<p>Sounds can be made in many different ways and individual sounds have the properties of pitch and volume.</p> <p>When a sound is made it immediately spreads out in all directions. As it travels its volume decreases but its pitch remains the same.</p> <p>Sound is made when an object is made to vibrate (move backwards and forwards or up and down). As the material vibrates it makes whatever it is in contact with vibrate, including air. As the air vibrates it makes whatever it is in contact with vibrate also, which might be a wall or even your eardrum. Sound moves through materials vibrating making other materials they are in contact with vibrate.</p>	<p>When light is emitted from a light source it travels in straight lines until it hits an object. This can be represented by an arrow. Shadows form when light hits an opaque object, the area behind is in darkness because light can only travel in straight lines.</p> <p>When light hits a transparent object it goes through it in a straight line so we can see a clear image through it. When light hits a translucent material it goes through it but is scattered, this means light can pass through but we can't see an image through it.</p> <p>When light hits a mirrored surface it reflects off it in straight lines, so we can see an image in the reflective material Some times when</p>	

<p><i>Find patterns in the way that the size of shadows change.</i></p> <p><i>Identify how sounds are made, associating some of them with something vibrating.</i></p> <p><i>Recognise that vibrations from sounds travel through a medium to the ear.</i></p> <p><i>Find patterns between the pitch of a sound and features of the object that produced it.</i></p> <p><i>Find patterns between the volume of a sound and the strength of the vibrations that produced it.</i></p> <p><i>Recognise that sounds get fainter as the distance from the sound source increases.</i></p>				<p>Pitch and volume are determined by how the material vibrates: Pitch is determined by how fast an object vibrates, i.e. the frequency of vibration. The higher the frequency the higher the pitch. Volume is determined by how big the movement of each vibration is (the amplitude of vibration). The bigger the amplitude the higher the volume.</p> <p>Smaller objects and tighter strings and surfaces tend to vibrate with a higher frequency</p>	<p>light hits a material it reflects off it in many different directions (it is scattered). In this case light will be reflected but no image will be seen in the material Shiny surfaces are better reflectors and rough surfaces scatter light more. Opaque objects don't allow any light to pass through them.</p> <p>Animals see objects when light is reflected off the object and enters the eye through the pupil. The pupil changes its size to allow enough, but not too much light into the eye. Too much light damages the eye and too little results in poor quality images.</p>	
<p>KS2</p> <p><i>Identify common appliances that run on electricity.</i></p> <p><i>Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers.</i></p> <p><i>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.</i></p> <p><i>Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit.</i></p> <p><i>Recognise some common conductors and insulators, and associate metals with being good conductors.</i></p> <p><i>Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit.</i></p>				<p>Lots of devices are powered by electricity; these need a source of electricity, which could be mains or battery.</p> <p>The battery's job is to push electricity to the device, but it needs something to carry the electricity all the way from the supply to the device, this is what we call a circuit.</p> <p>If there are more batteries, they push harder and so the device will work harder e.g. brighter or faster.</p> <p>However not everything can carry the electricity from the source to the device, some materials allow the electricity through (conductors) and others don't (insulators).</p>		<p>The power supply pushes the current round the circuit. The voltage of the power supply is a measure of this push. Batteries have a limited store of energy, when it is gone they no longer push the current.</p> <p>When current goes through a device it makes it work, the greater the current the harder the device works.</p> <p>When any device is placed in the circuit it makes it harder for current to flow (resistance). The more devices the greater the resistance and the lower the current.</p> <p>As current goes through a conductor it heats it up. The greater the current flowing the greater the heating effect. This can be useful in electrical heaters but can be hazardous and cause fires.</p>

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.

