

**SCIENCE NEW CURRICULUM 2016/2017**

Through the teaching of science at Handsworth Primary we aim to ensure that all pupils:

- Develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics.
- Develop understanding of the nature, processes and methods of science through different types of science enquiries that help them to answer scientific questions about the world around them are equipped with the scientific knowledge required to understand the uses and implications of science, today and for the future.



**Overview of units**

Nursery Age related expectations	Local environment	How Toys work	Observing changes in local environment	5 senses	Life cycles and plant growth	Observing local environment
Reception ELG: Age related expectations Emerging Expected Exceeding	The 5 senses	Forces and movement	Observing differences changes in materials	The water cycle	Life cycles Plant growth	Mini Beasts Observing local environment
Year 1	Animals including humans	Optional Unit Light and Dark	Everyday materials	Science Week Sound and Hearing	Plants	Seasonal Changes
Year 2	Use of everyday materials	Optional Unit Sound	Plants Animals including humans	Plants Animals including humans Science Week	All living things and their habitats	Working Scientifically
Year 3	Working Scientifically	Plants	Animals including humans	Rocks and Soils Science Week	Rocks and Soils	Light Forces and magnets
Year 4	States of Matter	Eating and Digestion	Eating and Digestion	All living things Science Week	Sound	Electricity
Year 5	Working Scientifically	Earth and Space	Forces	Properties and changes of materials Science Week	All living things	Animals including humans
Year 6	Working Scientifically	All living things	Animals including humans	Evolution and inheritance Science Week	Electricity	Light

**Schemes of work:** Hamilton Trust, Plan Bee, Rising Stars

**Assessment:** Risings Stars - Diagnostic, Mid and End of Unit Assessments to compute percentages, Continuous assessment using Focus Education Guidelines, End of year Assessment: Compute an average from Unit assessments throughout the year and add teacher assessment. Report on Assessment Template as a percentage and using the following drop down icon descriptives for Teacher assessment Below, Towards, At, Above and

**SCIENCE NEW CURRICULUM 2016/2017**



Teachers  
Mastery

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Working scientifically

'Working scientifically' specifies the understanding of the nature, processes and methods of science for each year group.

### Working scientifically: YEAR 1

During year 1, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:

- Asking simple questions and recognising that they can be answered in different ways.
- Observing closely, using simple equipment.
- Performing simple tests.
- Identifying and classifying.
- Using their observations and ideas to suggest answers to questions.
- Gathering and recording data to help in answering questions.

Plants	Animals including humans	Everyday materials	Seasonal changes	Optional unit Light
Year 1	Year 1	Year 1	Year 1	Year 1
<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>· identify and name a variety of common plants, including garden plants, wild plants and trees, and those classified as deciduous and evergreen</li> <li>· identify and describe the basic structure of a variety of common flowering plants, including roots, stem/trunk, leaves and flowers.</li> </ul>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>· identify and name a variety of common animals that are birds, fish, amphibians, reptiles, mammals and invertebrates</li> <li>· identify and name a variety of common animals that are carnivores, herbivores and omnivores</li> <li>· describe and compare the structure of a variety of common animals</li> </ul>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>· distinguish between an object and the material from which it is made</li> <li>· identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock</li> <li>· describe the simple physical properties of a variety of everyday materials</li> <li>· compare and group together a variety of everyday materials on</li> </ul>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>· observe changes across the four seasons</li> <li>· observe and describe weather associated with the seasons and how day length varies.</li> </ul>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>· observe and name a variety of sources of light, including electric lights, flames and the Sun</li> <li>· associate shadows with a light source being blocked by something.</li> </ul>

	<p>(birds, fish, amphibians, reptiles, mammals and invertebrates, and including pets)</p> <ul style="list-style-type: none"> <li>· identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.</li> </ul>	<p>the basis of their simple physical properties.</p> <ul style="list-style-type: none"> <li>· carry out an investigation in a safe way</li> </ul>		
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### Suggested ideas

<ul style="list-style-type: none"> <li>• Use the woods on a weekly basis to explore and learn trees and plants.</li> <li>• Discuss and describe a particular plant in detail. Take a photograph of it. Ask children what it will be like in a few weeks time. Make a list of what they say. Return to the plant in a few weeks.</li> <li>• Grow carrot tops, mustard and cress, pulses etc.</li> <li>• Sort and group large</li> </ul>	<ul style="list-style-type: none"> <li>• Sort things in school grounds into plants and animals.</li> <li>• Sort animals further into birds, fish, amphibians, reptiles, mammals and invertebrates.</li> <li>• Songs naming parts of the body, eg. Head, shoulders, knees and toes.</li> <li>• Draw round a child and label body parts.</li> <li>• Match food to different animals</li> <li>• Go on a sound walk</li> <li>• Consider how to</li> </ul>	<ul style="list-style-type: none"> <li>• Use senses to describe objects as shiny or dull, light or heavy, soft or hard, bendy or staff etc.</li> <li>• Grade a range of materials from shiniest to dulllest or lightest to heaviest etc.</li> <li>• Compile a class list or dictionary of words that describe materials.</li> <li>• Sort and group materials into groups like rough/smooth or colours or</li> </ul>	<ul style="list-style-type: none"> <li>• Keep a diary of weather and temperature over a long period.</li> <li>• Take the temperature at different points during a day.</li> <li>• Paint a picture of a tree at different times of the year.</li> <li>• Match clothing to season in which it will be needed.</li> <li>• Film a weather report.</li> </ul>	<ul style="list-style-type: none"> <li>• Going into a room which is pitch black and describing what it is like.</li> <li>• Brainstorming session of how many different sources of light the children can think of.</li> <li>• Go on a 'light' walk around local area to find different types of light eg. Traffic lights, stop lights, car lights, street lights, sunlight etc.</li> <li>• Make day and night pictures. How will</li> </ul>
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<p>seeds.</p> <ul style="list-style-type: none"> <li>• Cut open fruits to look at seeds, break open seeds.</li> <li>• Grow bulbs in water so that you can see the roots system.</li> <li>• Make rubbings of different leaves.</li> <li>• Make a labels or map of the different trees/plants found in the school grounds</li> </ul>	<p>treat living things with care and sensitivity.</p> <ul style="list-style-type: none"> <li>• Explore websites for more information such as <a href="http://www.animalsworlds.com/">http://www.animalsworlds.com/</a></li> </ul> <p>Find out more about carnivores, omnivores and herbivores at websites such as <a href="http://animals.pppst.com/what-animals-eat.html">http://animals.pppst.com/what-animals-eat.html</a></p>	<p>transparent, opaque, shiny, magnetic/non-magnetic.</p> <ul style="list-style-type: none"> <li>• Three of a kind. One person picks three things that have the same property, eg. they are all rough. The rest of the group/class have to figure out what the property is.</li> <li>• Odd one out. As 'Three of a kind' but one thing has a different property eg. two transparent and one opaque.</li> <li>• Test hardness by finding out which material will scratch which others.</li> <li>• Explore ways in which we could send an Easter egg through the post safely?</li> <li>• Make rubbings of surfaces.</li> <li>• Discussion about health and safety</li> </ul>		<p>they be different?</p> <ul style="list-style-type: none"> <li>• Make a display of objects/clothes used during the day/at night.</li> <li>• Go on a 'shadows' walk to observe light sources, direction of shadows.</li> <li>• Observing and describing something in subdued light then in bright light</li> </ul>
<p>Resource needs:</p>	<p>Resource needs:</p>	<p>Resource needs</p>	<p>Resource needs</p>	<p>Resource needs</p>

## Working Scientifically: YEAR 2

During year 2, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:

- Asking simple questions and recognising that they can be answered in different ways
- Observing closely, using simple equipment
- Performing simple tests
- Identifying and classifying
- Using their observations and ideas to suggest answers to questions
- Gathering and recording data to help in answering questions.

Plants	Animals including humans	Uses of everyday materials	Living things and their habitats	Optional unit Sound
<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>· observe and describe how seeds and bulbs grow into mature plants</li> <li>· find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.</li> </ul>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>· notice that animals, including humans, have offspring which grow into adults</li> <li>· find out about and describe the basic needs of animals, including humans, for survival (water, food and air)</li> <li>• describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.</li> </ul>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>· identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses</li> <li>· find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.</li> </ul>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>· explore and compare the differences between things that are living, dead, and things that have never been alive</li> <li>· 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</li> <li>· identify and name a</li> </ul>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>· observe and name a variety of sources of sound, noticing that we hear with our ears</li> <li>· recognise that sounds get fainter as the distance from the sound source increases.</li> </ul>

			<p>variety of plants and animals in their habitats, including micro-habitats.</p> <ul style="list-style-type: none"> <li>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.</li> </ul>	
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### Suggested ideas

<ul style="list-style-type: none"> <li>Keep a growing diary</li> <li>Grow water so that you can see the roots system</li> <li>Grow a bean plant and create a how-to-guide on how to look after it.</li> <li>Observational drawings of different plants</li> </ul>	<ul style="list-style-type: none"> <li>Put food into main groups ie. Meat, fruit and veg., cereal or dairy products.</li> <li>Collage of healthy/non healthy food etc. using pictures from magazines.</li> <li>How are babies looked after? What do they need?</li> <li>Look at photographs of children when they were younger - make a display.</li> <li>Discuss children's illness and how we get</li> </ul>	<ul style="list-style-type: none"> <li>Find equipment in a park play area that bends or twists.</li> <li>Make a model/collage out of different materials.</li> <li>Find different materials around the school.</li> <li>Play material bingo around the school.</li> <li>Group objects based on materials which they are made off.</li> <li>Changing of materials through heat</li> </ul>	<ul style="list-style-type: none"> <li>Discuss what is living, what is dead and what never lived at all.</li> <li>Discuss animal and plant differences re: protection e.g. colour, poisons, pattern, spikes etc.</li> <li>Draw the food chain grass, cows, humans</li> <li>One child describes a plant/bird/minibeast and others have to guess it</li> <li>Odd one out. A child chooses 3 pictures of a</li> </ul>	<ul style="list-style-type: none"> <li>Go on a sound walk either around school, in the school grounds or in the local community. If possible tape some of the sounds for use back in school.</li> <li>Make a collection of objects that can be used to make sounds (not just instruments, also familiar objects).</li> <li>Use the collection to make and describe as many different kinds of sound as they can eg. speaking, singing, a</li> </ul>
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	<p>better.</p> <ul style="list-style-type: none"> <li>• Match offspring with adult animals</li> </ul>		<p>minibeast/bird/plant. Others say which is odd one out and why</p>	<p>striking, plucking, shaking, scraping, blowing, loud, soft, loudest, softest etc.</p> <ul style="list-style-type: none"> <li>• Listen to sounds through different objects eg. cardboard tubes, plastic funnels etc.</li> <li>• Use materials to muffle sounds like alarm clocks.</li> <li>• Use materials to keep sound from ears (NB nothing should be put into ears)</li> <li>• Listen to tape recordings of sounds made with instruments. Find the instrument and try to make the same sound.</li> <li>• Make up a story with sound effects.</li> <li>• Make junk musical instruments that can be shaken, plucked, blown etc.</li> </ul>
Resource needs	Resource needs	Resource needs	Resource needs	Resource needs



## Working scientifically: YEAR 3

During year 3, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:

- Asking relevant questions and using different types of scientific enquiries to answer them
- Setting up simple practical enquiries, comparative and fair tests
- Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers
- Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions
- Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables
- Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions
- Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions
- Identifying differences, similarities or changes related to simple scientific ideas and processes
  - using straightforward scientific evidence to answer questions or to support their findings.

Plants	Animals including humans.	Forces and magnets	Rocks	Light
<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>· identify and describe the functions of different parts of flowering plants: roots, stem, leaves and flowers</li> <li>· 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</li> </ul>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>· 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</li> <li>· identify that humans and some animals have skeletons and muscles for support, protection and movement.</li> </ul>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>· compare how things move on different surfaces</li> <li>· notice that some forces need contact between two objects, but magnetic forces can act at a distance</li> <li>· observe how magnets attract or repel each other and attract some materials and not others</li> <li>· compare and group together a variety of</li> </ul>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>· compare and group together different kinds of rocks on the basis of their appearance and simple physical properties</li> <li>· describe in simple terms how fossils are formed when things that have lived are trapped within rock</li> <li>· recognise that soils are made from rocks and organic matter.</li> </ul>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>· recognise that they need light in order to see things and that dark is the absence of light</li> <li>· notice that light is reflected from surfaces</li> <li>· recognise that light from the sun can be dangerous and that there are ways to protect their eyes</li> <li>· recognise that shadows are formed when the light from a light source is</li> </ul>

<ul style="list-style-type: none"> <li>investigate the way in which water is transported within plants.</li> <li>explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.</li> </ul>		<p>everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials.</p> <ul style="list-style-type: none"> <li>describe magnets as having two poles</li> <li>predict whether two magnets will attract or repel each other, depending on which poles are facing.</li> </ul>		<p>blocked by a solid object</p> <ul style="list-style-type: none"> <li>find patterns in the way that the size of shadows change.</li> </ul>
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### Suggested ideas

<ul style="list-style-type: none"> <li>• Growing cress seeds to illustrate phototropism (growing towards the light)</li> <li>• Observational drawing of plants root systems</li> <li>• Looking at root vegetables</li> <li>• Sorting and grouping plants or pictures of plants according to those whose leaves we eat and those we do not</li> <li>• Design a poster to show what plants need to grow</li> <li>• Split the stem of a carnation upwards and put each half in a different food colouring.</li> <li>•</li> <li>• Diagram of the transportation of water and nutrients through the plant</li> </ul>	<ul style="list-style-type: none"> <li>• School cook to talk to children about planning school meals and a balanced diet</li> <li>• Cooking using healthy food and recipes</li> <li>• Collage of proteins, fats, carbohydrate, vitamin foods etc.</li> <li>• Collage of which part of plant a fruit or vegetable comes from</li> <li>• Sorting and grouping food packets</li> <li>• Ask children where their bones and muscles are</li> <li>• Make a paper model of a human skeleton</li> <li>• Make a jointed puppet using cardboard and split pins.</li> <li>•</li> <li>• Discussion about location and function of joints e.g. hinge, ball and socket and how they function</li> <li>• Sing 'Dem bones'</li> <li>• Measuring length of some bones in the human body e.g. femur, tarsels,</li> </ul>	<ul style="list-style-type: none"> <li>• Children have magnets and they search for magnetic materials</li> <li>• Discuss what magnetic materials do near magnets</li> <li>• Will magnets attract magnetic materials through paper, fabric etc?</li> <li>• Which part of a bar magnet attracts magnetic materials</li> <li>• Children have two bar magnets and explore how they interact</li> <li>• Discuss what bar magnets do near other bar magnets</li> <li>• Make a fishing game with magnets.</li> <li>•</li> <li>• Make a maze game. The object has to follow the path/maze on a board with a magnet pulling the object from underneath.</li> </ul>	<ul style="list-style-type: none"> <li>• Examining rocks and soils with lenses and microscopes</li> <li>• Discussing, sorting and grouping rocks</li> <li>• Taking rubbings of different rocks</li> <li>• Putting different rocks into water to see how the water level changes</li> <li>• Shaking different soils in a transparent screw top plastic container and leaving them to stand will reveal the contents in layers</li> </ul>	<ul style="list-style-type: none"> <li>• Exploring how shadows of stationary objects change through the day (or the seasons)</li> <li>• Discussing where the sun first appears and where it goes during the day</li> <li>• Discussing where the sun disappears and where it goes during the night</li> <li>• How does the apparent movement of the sun compare with our model of the solar system?</li> <li>• Where do colours go at night - a speculative discussion</li> <li>• What kind of lights make sharp shadows?</li> <li>• Sorting and grouping materials into opaque, shiny and transparent.</li> <li>• Make a shadow clock in the playground</li> <li>• Using shadows of children's heads to draw silhouettes</li> <li>• Using a torch, some objects and a screen</li> </ul>
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	humerus etc.			<p>to create silhouettes and then drawing around them</p> <ul style="list-style-type: none"> <li>• Make a collage of objects that are opaque or shiny or transparent</li> <li>• Observational drawings of the same object in different kinds of light</li> </ul>
Resource needs	Resource needs	Resource needs	Resource needs	Resource needs

### Working scientifically: YEAR 4

During year 4, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:

- Asking relevant questions and using different types of scientific enquiries to answer them
- Setting up simple practical enquiries, comparative and fair tests
- Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers
- Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions
- Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables
- Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions

- Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions
- Identifying differences, similarities or changes related to simple scientific ideas and processes
- Using straightforward scientific evidence to answer questions or to support their findings.

All living things	Animals including humans	States of matter	Electricity	Sound
<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>· recognise that living things can be grouped in a variety of ways</li> <li>· explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment</li> <li>· recognise that environments can change and that this can sometimes pose dangers to living things.</li> </ul>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>· describe the simple functions of the basic parts of the digestive system in humans</li> <li>· identify the different types of teeth in humans and their simple functions</li> <li>· construct and interpret a variety of food chains, identifying producers, predators and prey.</li> </ul>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>· compare and group materials together, according to whether they are solids, liquids or gases</li> <li>· 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)</li> <li>· identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.</li> </ul>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>· identify common appliances that run on electricity</li> <li>· construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers</li> <li>· 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.</li> <li>· recognise that a switch opens and closes a circuit and associate this with whether or not a lamp</li> </ul>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>· identify how sounds are made, associating some of them with something vibrating</li> <li>· recognise that vibrations from sounds travel through a medium to the ear</li> <li>· find patterns between the pitch of a sound and features of the object that produced it</li> <li>· find patterns between the volume of a sound and the strength of the vibrations that produced it</li> <li>· recognise that sounds get fainter as the distance from the sound source increases.</li> </ul>

			<p>lights in a simple series circuit</p> <ul style="list-style-type: none"> <li>recognise some common conductors and insulators, and associate metals with being good conductors.</li> </ul>	
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### Suggested ideas

<ul style="list-style-type: none"> <li>Using keys in reference books, identify minibeasts found in school grounds according to body parts/wings/legs/number of legs etc.</li> <li>Using keys in reference books identify plants in classroom or school grounds according to leaf shape/flower/growth etc.</li> <li>Odd one out. A child chooses 3 pictures of a minibeast/bird/plant. Others say which is odd one out and why.</li> </ul>	<ul style="list-style-type: none"> <li>Label a diagram of the different parts of the digestive system.</li> <li>Use websites to explore the digestive system such as <a href="http://kidshealth.org/kid/interactive/digestive_it.html">http://kidshealth.org/kid/interactive/digestive_it.html</a></li> <li>Make a model of a digestive system</li> <li>Use model teeth and break up play dough</li> <li>Create food chains for animals in different countries.</li> <li>Sort animals into carnivores, omnivores and herbivores.</li> </ul>	<ul style="list-style-type: none"> <li>Discussing, sorting and grouping familiar materials as solids or liquids</li> <li>How many powders and how many liquids can you name?</li> <li>Discussing the difference between powders and liquids</li> <li>Handling Smarties and Treats to see how long they take to melt</li> <li>Time how long it takes ice to melt in different parts of the room</li> <li>Putting liquids in the freezer e.g. water, cooking oil, milk, sauce, salad cream.</li> </ul>	<ul style="list-style-type: none"> <li>Make a light-up Christmas card</li> <li>Making a bulb light with the least possible equipment</li> <li>Making a bulb light with a switch in the circuit</li> <li>Draw simple circuits using agreed symbols</li> <li>How can you make a bulb flash and what could it be used for?</li> <li>Writing about the journey electricity makes as it goes around a circuit describing what it does in bulbs, wires and switches.</li> </ul>	<ul style="list-style-type: none"> <li>How are sound and vibrations connected? Hands on radios, tape players and anything else that makes sound and vibrates</li> <li>How are vibrations affected by volume, tone and tuning buttons?</li> <li>Hands on our own throats whilst humming - feel the vibrations?</li> <li>Watching rice on an upturned speaker, how is it affected by volume and tone</li> <li>Making and testing junk instruments</li> <li>Putting a range of vibrating tuning forks</li> </ul>
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<ul style="list-style-type: none"> <li>•</li> <li>• Make a database for minibeasts, plants or birds</li> <li>• Looking after stick insects/spiders/woodlice/caterpillars in the classroom</li> <li>• Discuss animal and plant differences re: protection e.g. colour, poisons, pattern, spikes etc.</li> <li>• Draw the food chain grass, cows, humans</li> <li>• Discuss what happens if there is not enough food or water</li> <li>• Asking children their favourite foods and sorting into plants/animals</li> <li>• Making a mobile based on a food chain or web</li> <li>• Drawing food chains which contain plants/animals with which we are familiar</li> </ul>		<ul style="list-style-type: none"> <li>• Separating by sieving: Big beans from small beans, lentils from rice, rice from salt, sand from stones, solid particles in oven dried soils</li> <li>• Discussing, explaining and learning the meaning of dissolve, soluble, insoluble and solution in relation to salt, sand and water</li> <li>• Filtering salt water and sand in water through paper</li> <li>• Dissolving Race. Each team has a plastic bottle half full of water, and salt. One spoonful is added the teams see who can make the salt dissolve fastest</li> <li>• Making a poster or collage showing solids and liquids and/or their properties</li> <li>• Draw a storyboard about the journey of water in the watercycle.</li> <li>• Draw pictures which</li> </ul>	<ul style="list-style-type: none"> <li>• Check pictures of circuits, indicating which will work, then using equipment to make and test each circuit</li> </ul>	<p>into water</p> <ul style="list-style-type: none"> <li>• Write a mnemonic poem about vibrations</li> <li>• Cut the top of a straw into a triangle and blow through it. Cut the straw shorter and shorter to investigate how pitch changes.</li> <li>• Challenge children to make the best string telephone with resources provided.</li> <li>• Design and make an Ear Trumpet or a megaphone</li> </ul>
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		show examples of condensation and evaporation.		
Resource needs	Resource needs	Resource needs	Resource needs	Resource needs

### Working scientifically: YEAR 5

During year 5, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:

- Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary
- Taking measurements, using a range of scientific equipment, with increasing accuracy and precision
- Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, and bar and line graphs
- Using test results to make predictions to set up further comparative and fair tests
- Using simple models to describe scientific ideas



- Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of results, in oral and written forms such as displays and other presentations
- Identifying scientific evidence that has been used to support

All living things	Animals including humans	Properties and changes of materials	Forces	Earth and Space
<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>· explain the differences in the life cycles of a mammal, an amphibian, an insect and a bird</li> <li>· describe the life process of reproduction in some plants and animals.</li> </ul>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>· describe the changes as humans develop from birth to old age.</li> </ul>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>· compare and group together everyday materials based on evidence from comparative and fair tests, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets</li> <li>· understand that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution.</li> <li>· use knowledge of solids, liquids and gases to decide how mixtures might be separated, including</li> </ul>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>· explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object</li> <li>· identify the effects of air resistance, water resistance and friction, that act between moving surfaces</li> <li>· understand that force and motion can be transferred through mechanical devices such as gears, pulleys, levers and springs.</li> </ul>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>· describe the movement of the Earth, and other planets, relative to the Sun in the solar system</li> <li>· describe the movement of the Moon relative to the Earth</li> <li>· describe the Sun, Earth and Moon as approximately spherical bodies</li> <li>· use the idea of the Earth's rotation to explain day and night.</li> </ul>

		<p>through filtering, sieving and evaporating</p> <ul style="list-style-type: none"> <li>• give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic</li> <li>• demonstrate that dissolving, mixing and changes of state are reversible changes</li> <li>• 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.</li> </ul>		
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### Suggested ideas

<ul style="list-style-type: none"> <li>• Make a poster that explains pollination, fertilization, seed production, seed dispersal, germination</li> </ul>	<ul style="list-style-type: none"> <li>• Link to schools puberty talks</li> <li>• Draw humans at different stages with correct head to body</li> </ul>	<ul style="list-style-type: none"> <li>• Discussing the difference between powders and liquids</li> <li>• Discussing, sorting and grouping familiar</li> </ul>	<ul style="list-style-type: none"> <li>• Rolling the same ball or car down different steps</li> <li>• Make and discuss parachutes - what</li> </ul>	<ul style="list-style-type: none"> <li>• Discuss why different parts of the school are sunny/shady at different times of the day</li> </ul>
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<p>and plant growth</p> <ul style="list-style-type: none"> <li>• Research which creatures carry pollen from flower to flower and why</li> <li>• List things that aid seed dispersal</li> <li>• Explore differences in life cycles between different types of animals.</li> </ul>	<p>ratios.</p> <ul style="list-style-type: none"> <li>• Plot average height of males and females as they grow into a line graph.</li> <li>• Compare differences and rate of growth at different stages.</li> </ul>	<p>materials as solids or liquids</p> <ul style="list-style-type: none"> <li>• Making a poster or collage illustrating the properties of solids or liquids or gases</li> <li>• List all you eat in a day as solids, liquids or gases</li> <li>• Explain with a drawing how smells travel around buildings</li> <li>• Research gases and their uses</li> <li>• Matching words to definitions evaporating, condensing etc.</li> <li>• Explore ways to remove salt from water.</li> <li>• Group changes into reversible and irreversible reactions.</li> </ul>	<p>slows them down</p> <ul style="list-style-type: none"> <li>• Explore why racing cars and motorbikes are strange shapes.</li> <li>• Discussion about floating and sinking - what pulls things down and what pushes them up?</li> <li>• Discuss autogyros - what pulls them down what holds them up</li> <li>• Discuss paper aeroplanes - what makes them go, what makes them stop</li> <li>• Make a plasticine boat that will support 50g</li> </ul>	<ul style="list-style-type: none"> <li>• Draw around the shadow of a child in the same place at different times of the day</li> <li>• Keep a record of how the position of sun changes through the day</li> <li>• Design and make a sundial</li> <li>• Make 3D models of Earth, Moon and Sun from plasticine, papier mache, fruit or balloons</li> <li>• Discuss a moving model of the Earth, Moon and Sun</li> <li>• Use a globe and a spotlight to discuss day and night</li> <li>• Use a globe and a spotlight to discuss the year</li> <li>• Explore the Perseid meteor and how this yearly meteor shower can be explained by moving of the Earth around the sun.</li> </ul>
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Resource needs	Resource needs	Resource needs	Resource needs	Resource needs
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### Working scientifically: YEAR 6

During year 6, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:

- Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary

- Taking measurements, using a range of scientific equipment, with increasing accuracy and precision
- Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, and bar and line graphs
- Using test results to make predictions to set up further comparative and fair tests
- Using simple models to describe scientific ideas
- Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of results, in oral and written forms such as displays and other presentations
- Identifying scientific evidence that has been used to support.

All living things	Animals including humans	Evolution and inheritance	Electricity	Light
<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>· 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</li> <li>· give reasons for classifying plants and animals based on specific characteristics.</li> </ul>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>· identify and name the main parts of the human circulatory system, and explain the functions of the heart, blood vessels and blood</li> <li>· recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function</li> <li>· describe the ways in which nutrients and water are transported within animals, including humans.</li> </ul>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>· recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago</li> <li>· recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents</li> <li>· Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.</li> </ul>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>• associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit</li> <li>• 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</li> <li>• use recognised symbols when representing a simple circuit in a diagram.</li> </ul>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>• recognise that light appears to travel in straight lines</li> <li>• 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</li> <li>• 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</li> <li>• use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that</li> </ul>

cast them.

### Suggested ideas

<ul style="list-style-type: none"><li>• Discuss why the original method of classification in plants and animals would be a problem with all the organisms which we now know about.</li><li>• Watch videos to explore classification like <a href="http://youtu.be/ZrrZAp9N46c">http://youtu.be/ZrrZAp9N46c</a></li><li>• Sort a selection of animals into groups based on similar characteristics.</li><li>• Discuss some of the problems with how scientists before Linnaeus used to classify animals e.g. by if they were wild or domestic or terrestrial or aquatic or large or small.</li><li>• Give examples that would be difficult to classify into each group.</li><li>• Find out about</li></ul>	<ul style="list-style-type: none"><li>• Link to PSHE and drug awareness.</li><li>• Explore the job of each part of the circulatory and digestive systems.</li><li>• Dramatization depicting the different stages of each system.</li><li>• Make a movie on how to keep you bodies healthy.</li><li>• Create a quiz about the body.</li><li>• Explore different body systems using websites such as <a href="http://kidshealth.org/kid/htbw/">http://kidshealth.org/kid/htbw/</a></li><li>• Make links between the different systems see <a href="http://tinyurl.com/kzsoobb">http://tinyurl.com/kzsoobb</a> for an example of how this might look.</li><li>• Recreate parts of the different systems using</li></ul>	<ul style="list-style-type: none"><li>• Odd one out. A child chooses 3 pictures of a minibeast/bird/plant. Others say which is odd one out and why</li><li>• Classifying pictures of animals. Which live in hot or cold climates?</li><li>• Pupils could use online resources to find out about a specific animal and a specific plant and then find out how it is suited to the environment in which it lives.</li><li>• Create a tree of life to show the link between species.</li><li>• Identify examples of how animals have adapted to their environment.</li><li>• Explore Darwin's idea of evolution by using websites such as <a href="http://tinyurl.com/pxle7sh">http://tinyurl.com/pxle7sh</a></li></ul>	<ul style="list-style-type: none"><li>• Create a light to wear if caving.</li><li>• Create a burglar alarm.</li><li>• Spot the mistake in a circuit diagram and correct.</li><li>• Draw on circuits using correct symbols.</li></ul>	<ul style="list-style-type: none"><li>• Read Periscope by Michael Rosen</li><li>• Then create a periscope and explain how it works.</li><li>• Find your blind spot</li><li>• Create a pin hole camera</li><li>• Look at and through lenses and prisms and try to explain what happens to light shone through them.</li></ul>
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<p>Linnaeus inclusion of animals such as Homo ferus (wild man) and Homo caudatus (man with tail) might have been included in the classification system.</p> <ul style="list-style-type: none"> <li>• Discuss why you think that some species have been names up to 20 times in the classification system.</li> <li>• Create a new animal which would fit into a specific part of the classification system.</li> </ul>	<p>experiments at <a href="http://tinyurl.com/me4blww">http://tinyurl.com/me4blww</a></p>			
<p>Resource needs</p>	<p>Resource needs</p>	<p>Resource needs</p>	<p>Resource needs</p>	<p>Resource needs</p>