

Eastfield Primary School



Science Long Term Curriculum Plan 2019-2020

Science at Eastfield Primary School

Long Term Plan for Science Curriculum 2014

The national curriculum for science aims 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

Discover

New Things

View the world around us

Explore

Be curious

Be confident to share opinions

Explore Ideas

Have Great fun hands on

Ask real questions

Make mistakes and learn from them

Experience





Key Stage 1
Programme of Study

Working scientifically

During years 1 and 2, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:

S1 asking simple questions and recognising that they can be answered in different ways

S2 observing closely, using simple equipment

S3 performing simple tests

S4 identifying and classifying

S5 using their observations and ideas to suggest answers to questions

S6 gathering and recording data to help in answering questions

	Scientific Knowledge	Scientific Skills	Pre-load Knowledge	Vocabulary	
Year 1 Science	<p>Animals, including humans</p> <ul style="list-style-type: none"> Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals (know how to classify animals) Identify and name a variety of common animals that are carnivores, herbivores and omnivores (know how to classify animals by what they eat) Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals including pets) <p><u>Assessment Opportunity</u> Match the animals to their groups. Explain why they have put them in a particular group.</p> <ul style="list-style-type: none"> Know how to sort living and non-living things Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense <p><u>Assessment Opportunity</u> Match the senses to the body part (Use pictures if needed)</p>	<p>Identifying and classifying. This could be achieved by grouping animals according to diet e.g. Carnivores, omnivores, herbivores.</p> <p>Asking simple questions This could be achieved by choosing an animal and the children generating questions about that animal.</p> <p>(Grouping and classifying)</p>	<ul style="list-style-type: none"> Sound – hearing (senses) Habitats and living things – understand what a habitat is and explore local environment Habitats and living things – identify the specific environments of animals Light – identify eyes in animals and relate to sight e.g. Owl in the dark. 	<p>Amphibians Reptiles Mammals Carnivores Herbivores Omnivores Gills Claws</p>	<p>Hooves Hips More advanced human body parts</p> <ul style="list-style-type: none"> Ankle Elbow Hips Shoulder Knee
	<p>Seasonal changes</p> <ul style="list-style-type: none"> Name the seasons Observe changes across the 4 seasons Observe and describe weather associated with the seasons and how day length varies <p><u>Assessment Opportunity</u> Use weather forecast to demonstrate they can they can describe the weather and daylight in each season.</p>	<p>Observing closely, using simple equipment. This could be achieved by observing that at different times of the year it is either lighter or darker when they get up and go to bed. This could be achieved by looking at weather and plants across the seasons and identifying the changes.</p> <p>Gathering and recording data to help in answering questions. This could be achieved by making a table or chart of rainfall or temperature, sunset and sunrise for</p>	<ul style="list-style-type: none"> Forces and magnets – air resistance through discussing when you can fly a kite Sound – different sounds heard in different seasons Light – changes to light over seasons 	<p>Autumn Spring Summer Winter Temperature Frost Storm Shadows Deciduous</p>	<p>Sunburn Frostbite</p>



	<p>Everyday materials 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</p> <p>Assessment Opportunity Put given materials into groups and explain their reasons.</p>	<p>length of day. E.g. pictogram (Observation over time). (Pattern Seeking)</p> <p>Using their observations and ideas to suggest answers to questions. Identifying and classifying. This could be achieved by naming and sorting materials on the basis of their physical properties.</p> <p>Perform simple tests. This could be achieved by exploring objects that are always made out of the same material. E.g. Window made from glass. This could be achieved by name and property. Simple tests could be performed according to their property e.g. testing waterproof/absorbent. e.g. an umbrella. A final test could be performed to choose an appropriate material for a task based on a property. (Comparative testing)</p>	<ul style="list-style-type: none"> Forces and magnets – discuss different surfaces of materials (link to friction) 	<p>evergreen</p> <p>Wood Plastic Glass Paper Metal Rock Water properties</p>	<p>Material Hard Soft Bendy Rough smooth</p>
	<p>Plants Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees Identify and describe the basic structure of a variety of common flowering plants, including trees (know and name the petals, stem, leaves and root of a plant. Know and name the roots, trunk, branches and leaves of a tree)</p> <p>Assessment Opportunity Make a poster with the parts of the plant labelled.</p>	<p>Observing closely, using simple equipment. This could be achieved by identifying plants and trees e.g. names of plants, names of plant parts. This could be achieved by identifying trees by their leaves. This could be achieved by using a magnifying glass to observe different leaf buds and how the leaf bud develops over time.</p> <p>(Grouping and classifying / Observation over time).</p>	<ul style="list-style-type: none"> Habitats and living things – identify the specific environments of plants 	<p>Deciduous evergreen Stem Roots Soil Petal Trunk Branches</p>	<p>Seed/bulb Compost Blossom Names of plants and trees</p>



	Scientific Knowledge	Scientific Skills	Pre-load Knowledge	Vocabulary		
Year 2 Science	<p>Living things and their habitats Explore and compare the differences between things that are living, dead, and things that have never been alive Identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other (know a specific habitat provides for the basic needs of the things living there) 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 <u>Assessment Opportunity</u> Matching activity. Match animals to where they live and what they eat.</p>	<p>Identifying and classifying. This could be achieved by exploring, classifying and comparing the differences between things that are 'alive', 'dead', or 'never alive'. Using their observations and ideas to suggest answers to questions. This could be achieved by designing a habitat for an animal based on their observations of habitats and the animals needs. Observing closely, using simple equipment. This could be achieved by using a magnifying glass to look at a small area of a habitat. e.g. school field. (Researching using secondary resources- researching which animals live in a habitat). (Pattern seeking-any features that animals have the same within a habitat). (Grouping and classifying).</p>	<ul style="list-style-type: none"> • Light – some animals come out in the daylight whilst others are nocturnal • Sound – look at nocturnal animals and the importance of hearing • Evolution and inheritance – Discussion of extinct animals over time e.g. dinosaurs • Animals inc humans – habitats provide basic needs for animals and plants (food – touch upon food chains) 			
	<p>Uses of everyday materials Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses Know how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching <u>Assessment Opportunity</u> Create a poster (Use a table format) to show all the different types of materials they know and how they can be changed.</p>	<ul style="list-style-type: none"> • Gathering and recording data to help in answering questions. This could be achieved by completing a table looking at how materials can be changed. Does it bend? Does it squash? Does it twist? Does it stretch? Perform simple tests. This could be achieved by investigating the suitability of a material based on multiple properties. Bendy, waterproof and strong. E.g. a cover for a picnic basket. (Comparative testing). 	<ul style="list-style-type: none"> • Sound – suitability of materials to make a musical instrument • Forces – suitability of materials e.g. to make a fridge magnet • States of matter – properties of a range of solids 	Waterproof Absorbent Opaque Transparent Brick Fabric Elastic foil	Cardboard Stretchy Stiff Shiny Dull Squash Twisty stretchy	



	<p>Plants Observe, know and describe how seeds and bulbs grow into mature plants</p> <p>Find out, know and describe how plants need water, light and a suitable temperature to grow and stay healthy</p> <p><u>Assessment Opportunity</u> Draw a diagram to show how a seed grows into a plant. Label the things that it needs at each stage (Possibly use pictures of a plant grown in class at the different stages)</p>	<p>Perform simple tests. This could be achieved by observing plants at different stages of its growth during a simple test.</p> <p>This could be achieved by setting up a comparative experiment to conclude the best conditions for plant growth.</p> <p>Gathering and recording data to help in answering questions. This could be achieved by measuring the height of plant as it grows.</p> <p>Asking simple questions and recognising they can be answered in different ways. This could be achieved by looking at how much light or water a plant needs to grow. Where does a plant grow best? Children to suggest ways of answering. E.g. child 1-outside, child 2 –on the windowsill. As a starting point look at questions that can be answered and questions that can be.</p> <p>(Observation over time and comparative testing)</p>	<ul style="list-style-type: none"> • Light - Plants need a light source • Earth and space – plants need the light from the sun to grow 	Seedlings Shoot Temperature Bud Germination Reproduction Nutrients Conditions	
	<p>Animals, including humans</p> <ul style="list-style-type: none"> • Notice and know that animals, including humans, have offspring which grow into adults and know the stages of the cycle • Find out about and describe the basic needs of animals, including humans, for survival (water, food and air) • Know and describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene <p><u>Assessment Opportunity</u> Make a comparison between the needs of humans and animals- Make a table of similarities and difference</p>	<p>Using their observations and ideas to suggest answers to questions. This could be achieved by answering questions about what animals need to survive and what humans need to stay healthy.</p> <p>This could be achieved by answering questions about growth of animals and humans.</p> <p>This could be achieved by observing the importance of hygiene using a light box to check hand washing/paint on hands.</p>	<ul style="list-style-type: none"> • Evolution and inheritance– note how offspring often look similar to parents. 	Habitat offspring adult reproduction water air survival mouth tongue teeth exercise diet	Hygiene Nutrition Growth Eat food



Lower Key stage 2
Programme of Study

Working scientifically

During years 3 and 4, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:

S1 asking relevant questions and using different types of scientific enquiries to answer them

S2 setting up simple practical enquiries, comparative and fair tests

S3 making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers

S4 gathering, recording, classifying and presenting data in a variety of ways to help in answering questions

S5 recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables

S6 reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions

S7 using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions

S8 identifying differences, similarities or changes related to simple scientific ideas and processes

S9 using straightforward scientific evidence to answer questions or to support their findings.

	Scientific Knowledge	Scientific Skills	Pre-load Knowledge	Vocabulary	
Year 3 Science	<p>Rocks 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 Know about and explain the differences between sedimentary, metamorphic and igneous rock <u>Assessment Opportunity</u> Create a table to show what they have learnt about rocks, fossils and soils. 1) Identify examples 2) describe how they were made</p>	<p>Recording findings using simple scientific language, drawings, labelled diagrams, keys, and tables This could be achieved by observing a variety of rocks (using hand lenses or microscopes) and identifying and testing characteristics in the form of a table. (Grouping and classifying) Identifying differences, similarities or changes related to simple scientific ideas and processes This would enable similarities and differences to be identified. Research how fossils are made, make their own fossils and label diagrams to record the changes. (Researching, Grouping and Classifying) • recording and classifying to help answer questions This could be extended to classifying the rocks based on properties. Children to experience a range of soils and label the different parts. Storyboard of the cycle of changes from rock to soil to demonstrate scientific processes. (Grouping and Classifying)</p>	<ul style="list-style-type: none"> Forces and magnets – gravity resulting in fossil formation States of matter – discuss the change of state in matter when a fossil is formed Evolution and inheritance – fossils give us information about the past 	Granite Chalk Limestone Organic Permeable Impermeable Fossils Sedimentary	Rocks Slate Marble Matter Property Formation Soil



	<p>Forces and magnets Compare and know how things move on different surfaces Know how a pulley works and helps make lifting an object simpler Notice and know that some forces need contact between 2 objects, but magnetic forces can act at a distance and give examples Observe, know and explain how magnets attract or repel each other and attract some materials and not others</p> <p>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> <p><u>Assessment Opportunity</u> Children to make conclusions about forces and magnets. What have they learnt? Also, make a list of questions they would like to further investigate</p>	<p>Using straightforward scientific evidence to answer questions or to support their findings. Use magnets to test a range of materials to test whether they are magnetic or not and use this to make conclusions about what magnetic materials have in common. Pupils could look for patterns in the way that magnets react to each other. (Pattern seeking) Setting up simple practical enquiries, comparative and fair tests</p> <p>Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions This could be achieved by testing how e.g. a car moves on different surfaces and using results to answer given questions, suggest improvements and raise further questions. Use results to raise further questions e.g. Are all metals magnetic? (Fair testing)</p>	<p>Materials – attraction to magnets (include transparent)</p>	<p>Force Magnets (bar, ring horseshoe) Attract Repel Strength Magnetic Surface</p>	<p>Poles Push Pull Distance Direct contact Properties</p>
	<p>Light Recognise that they need light in order to see things and that dark is the absence of light Notice that light is reflected from surfaces Recognise that light from the sun can be dangerous and that there are ways to protect their eyes Recognise that shadows are formed when the light from a light source is blocked by a solid object find patterns in the way that the size of shadows change</p> <p><u>Assessment Opportunity</u> Pupils given pictures of different shadows to explain how the shadow is made and why it is different.</p>	<p>Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including data loggers This can be achieved by using data loggers to test the amount of light in different places at different times of the day. Use standard measurements and record results using a bar chart. (Observing over time) Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions Record measurements in the form of a table using standard measurements. Investigate the change in the size of the shadow compared to the distance of the light source. Draw diagrams to explain how light is reflected from different surfaces. (Pattern seeking)</p>	<ul style="list-style-type: none"> • Sound – light reflects off surfaces as does sound (echoes) • Earth and space – describe what dark is in terms of the Earth’s rotation (night and day) • Electricity – know that torches allow us to see in the absence of natural light (electrical sources) 	<p>Light Dark Shadow Reflect Light source Solid Block Mirror</p>	<p>Reflective surface Transparent Translucent Absence of light Bright Dull</p>



<p>Animals, including humans Identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat Know how nutrients, water and oxygen are transported within animals and humans. Identify that humans and some other animals have skeletons and muscles for support, protection and movement <u>Assessment Opportunity</u> Make a comparison between humans and other mammals. Explain why some things are different while other are similar.</p>	<p>Recording findings using simple scientific language, drawings, labelled diagrams and tables This could be achieved by conducting research around skeletons of different animals and presenting the information with drawings and labelled diagrams. (Research) Using straightforward scientific evidence to answer questions or to support their findings. Research could also be conducted into what food different animals eat to meet their nutritional needs. This could be recorded as a table. (Research)</p>	<ul style="list-style-type: none"> • Sound – bones in ears and their role • Living things and their habitats – group animals as vertebrates or invertebrates 	<p>Skeleton Muscles Skull Ribs Hips Protection healthy</p>	<p>Movement Carbohydrates Muscles Protein Fats Sugar Balanced diet</p>
<p>Plants Identify and describe the functions of different parts of flowering plants and trees: roots, stem/trunk, leaves and flowers Explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant Investigate the way in which water is transported within plants Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal <u>Assessment Opportunity</u> <u>Pupils to make predictions (based on investigation</u></p>	<p>Asking relevant questions and using different types of scientific enquiries to answer them This could be achieved by children asking questions from their prior knowledge in year 2 about the requirements of plants for life. Pupils will complete a fair test to investigate these requirements e.g. light, water, temperature. (Fair testing and observing over time) Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions Pupils will draw conclusions from given data and use this to make conclusions about their own data. This will allow them to make predictions and raise further questions. (Pattern seeking)</p>	<ul style="list-style-type: none"> • Forces and magnets – discuss gravity and wind force in seed dispersal • States of matter – gases: explore the requirements of plants (oxygen, nitrogen, carbon dioxide) 	<p>Pollination Seed formation Seed dispersal Transported Stamen Style Stigma Fertiliser Pollen nectar</p>	



	Scientific Knowledge	Scientific Skills	Pre-load Knowledge	Vocabulary
Year 4 Science	<p>Living things and their habitats Recognise that living things can be grouped in a variety of ways (classification) Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment Recognise that environments can change and that this can sometimes pose dangers to living things <u>Assessment Opportunity</u> Write balanced argument through English about the positive and negative impact of humans on the environment. (Should humans be eliminated from the planet?) Use a classification key to identify the given organisms.</p>	<p>Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions This could be achieved by using existing classification keys to group living things as well as creating their own. Pupils can begin to group vertebrate animals into groups such as fish, amphibians, reptiles, birds and mammals; and invertebrates into snails and slugs, worms, spiders and insects. Plants can be grouped into flowering and non-flowering. Pupils classify living things by asking questions about their features. (Grouping and Classifying) Identifying differences, similarities or changes related to simple scientific ideas and processes Use scientific equipment to find and observe the similarities and differences of creatures in the local environment. (Observations) Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables Gather information on the impact of environmental changes on living things. Give the children data (tables/ graphs) and use to create explanations for the impact of environmental changes. (Research)</p>	<ul style="list-style-type: none"> Evolution and inheritance – different animals are suited to different environments 	Adaptation Classification Ecology Deforestation Pollution Environment Population Identify Group Litter
	<p>Electricity Identify common appliances that run on electricity Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers Identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp's 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 <u>Assessment Opportunity</u> Sort given materials into conductors or</p>	<p>Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables This could be achieved by constructing a circuit and drawing a labelled diagram with non-standard images to record findings. (Observations) Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions Use a circuit to test whether materials are conductors or insulators, record information in tables and explain results. (Pattern seeking) Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions Use knowledge of a circuit to make predictions about which materials would be insulators or conductors. Use results from the enquiry into insulators/ conductors to raise further questions. (Grouping & Classifying)</p>	<ul style="list-style-type: none"> Electricity (Y6) – look at what happens when more cells are added or more bulbs/buzzers. Brief discussion as to why. 	Buzzer Insulator Electricity component Cell Battery Lamp Switch Circuit Conductor Bulb Motor Open Closed Series parallel



		by evaporation and condensation in the water cycle. (Research)		
	<p>Animals, including humans 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</p> <p><u>Assessment Opportunity</u> Write an explanation of digestion, beginning with the mouth and the functions of the teeth</p> <p>Construct and interpret a variety of food chains, identifying producers, predators and prey <u>Assessment Opportunity</u> Draw and label a food chain. Explain the vocabulary</p>	<p>Using straightforward scientific evidence to answer questions or to support their findings. This could be achieved by researching what food the different types of animals eat and linking this with the range of teeth that each animal has. (Researching) Asking relevant questions and using different types of scientific enquiries to answer them Ask questions about the effect of diet on teeth. Use eggshell to investigate and answer these questions. (Comparative test) Identify differences, similarities or changes related to simple scientific ideas and processes. Identify what an animal would eat based on its teeth. Classify animals into producers, predators and prey according to their place in the food chain. (Grouping and Classifying)</p>	<ul style="list-style-type: none"> Evolution and inheritance – discuss the teeth of a particular animal (e.g. tiger). Discuss how the type of teeth help the species prosper. E.g. what if a tiger had the same teeth as a horse. What impact be on their survival? 	Digestive system Oesophagus Stomach Small/large intestines Incisors Molars Pre-molars Canines Wisdom teeth Milk teeth Pulp Enamel Root Gum Food chain Producer Predator Prey Consume

Upper Key Stage 2
 Programme of Study

Working scientifically

During years 5 and 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, taking repeat readings when appropriate
- recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs
- using test results to make predictions to set up further comparative and fair tests
- reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations
- identifying scientific evidence that has been used to support or refute ideas or arguments



	Scientific Knowledge	Scientific Skills	Pre-load Knowledge	Vocabulary
Year 5 Science	<p>Living things and their habitats Describe the differences in the lifecycles of a mammal, an amphibian, an insect and a bird</p> <p>Describe the life process of reproduction in some plants and animals (Study native Mexican Animals) <u>Assessment Opportunity</u> Complete a table to show the similarities and differences between the mammal, amphibian, insect and bird.</p>	<p>Reporting and presenting findings from enquiries, including conclusions, in oral and written forms such as displays and other presentations. This could be achieved by... creating presentations based on findings from research into the lifecycle of animals from different kingdoms (focus on comparing mammal, amphibian, insect and bird) Look for patterns with the life cycle of animals and their habitats.</p> <p>(Research Using Secondary Sources) Recording data and results of increasing complexity using tables, and classification keys. This could be achieved by... applying knowledge of lifecycles of animals from different kingdoms and using them to identify which kingdom an animal would belong to using a classification key. (E.g. birds start as an egg where as amphibians are born in water)</p> <p>(Grouping and Classifying)</p>	<ul style="list-style-type: none"> Evolution and inheritance – knowledge and understanding of life cycles Forces and magnets – fossilisation through pressure 	<p>Reproducing Reproduction Fertilise(tion) Germinate(tion) Movement Sensitivity Growth retirement Asexual/sexual puberty Organism Offspring Nutrition Excretion Respire Sibling Stamen Stigma Sepal</p>
	<p>Animals, including humans Describe the changes as humans develop to old age (Linked to SRE week) Puberty – male and female changes in puberty and beyond <u>Assessment Opportunity</u> Completed through PSHCE Pupils to explain these changes orally.</p>	<p>Recording data and results of increasing complexity using scientific diagrams and labels This could be achieved by finding patterns in the growth process linked to ageing. labelling diagrams to show before and after puberty or other changes that occur during pregnancy (e.g. a growing foetus – the differences at different stages of development). This could be achieved by finding patterns in the above collected data.</p> <p>(Observing Over Time & Pattern Seeking)</p>	<p>Animals including humans (Y6) – When discussing the lifecycle of humans, discuss how living a healthy lifestyle (exercise and balanced diet) can support progression through each stage.</p>	<p>Puberty Sibling Offspring Young Adult teenager Elderly Retirement Gestation Life cycle Period</p>



	<p>Evolution and inheritance 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</p> <p>Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution <u>Assessment Opportunity</u> Pupils create their own creature. Explain how it would be adapted to the environment it has been designed for.</p>	<p>Recording data and results of increasing complexity using scientific diagrams and labels Reporting and presenting findings from enquiries, including conclusions, in oral and written forms such as displays and other presentations. This could be achieved by... giving children specific animals and get them to use labelled diagrams and to present information on how an animal is adapted to live in its environment. Present findings on the work of e.g. Mary Anning, Charles Darwin and Alfred Wallace. (Research) Identifying scientific evidence that has been used to support or refute ideas or arguments This could be achieved by... showing children a range of images of parent birds and then they have, to identify possible offspring (including red herrings) Analyse the advantages and disadvantages of specific adaptations such as being on 2 feet rather than 4, having a long or short beak, having gills or lungs, having tendrils on climbing plants, brightly coloured and scented flowers. (Research)</p>		<p>Offspring Adaptation Characteristics Breeds Environments Genes Evolution Environments Palaeontologists Survival Species Classification</p>
	<p>Earth and space Describe the movement of the Earth and other planets relative to the sun in the solar system Know and 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 <u>Assessment Opportunity</u> Pupils create and information text on the solar system through English. Write an explanation of night and day</p>	<ul style="list-style-type: none"> identifying scientific evidence that has been used to support or refute ideas or arguments This could be achieved by... providing true and false facts or misconceptions of the movement of the earth, moon, planets and the apparent movement of the sun across the sky. Children to use knowledge to argue why this is incorrect. Look at the different theories past and present eg Flat Earthers. <p>(Research)</p>	<ul style="list-style-type: none"> Forces and magnets – gravity Light – explore day and night due to the rotation of the Earth and apparent movement of the sun across the sky Explore how shadow clocks and sundials work 	<p>Sun / Moon All planets of solar system Solar System Orbit Planets Spherical/ Rotate Axis / poles star Tilt Gravity Elliptical orbit Asteroid Eclipse Satellite Lunar Equator hemisphere</p>



	<p>Forces Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object Identify the effects of air resistance, water resistance and friction, that act between moving surfaces Recognise that some mechanisms including levers, pulleys and gears allow a smaller force to have a greater effect (Test air resistance with parachutes and investigate the effectiveness of different parachutes) (Investigate how air resistance principles have influenced the development of air travel) <u>Assessment Opportunity</u> Explain conclusions of a given set of data. Write own questions of further things to be investigated.</p>	<p>Using test results to make predictions to set up further comparative and fair tests This could be achieved by... carrying out initial investigations into air resistance and using results to create a new question related to water resistance (e.g. can findings from air resistance to applied to water resistance) to create new question to investigate. (Comparative and Fair Testing) Reporting and presenting findings from causal relationships. This could be achieved by measuring of time/distance of paper aeroplane to investigate air resistance, recording velocity. Reporting findings on the surface area of a spinner/parachute and the time taken to fall to the ground. Presenting findings to class in a more formal style. (Pattern Seeking)</p>	<p>Materials and their properties – discuss which materials would be suitable for a magnet</p>	<p>Gravity Resistance Air resistance Water resistance Mechanisms</p>
	<p>Properties and changes of materials Compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic Demonstrate that dissolving, mixing and changes of state are reversible changes</p>	<p>Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary. This could be achieved by... giving children a range of problems to overcome. (e.g. which material is the most suitable to keep ice cream cold?) and pupils independently creating their own questions to facilitate the investigation into properties of materials. Are all questions generated by pupils testable? Teacher to support refining of questions. (Comparative and Fair Testing) Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings where appropriate. This could be achieved by accurately of measuring temperature and temperature changes over time. Selecting the most appropriate equipment for the experiment they are investigating.</p>	<ul style="list-style-type: none"> • Light – discuss how light travels through different materials e.g. transparent, translucent and opaque • Light – Discussion of how light travels through different states of matter. E.g. how light travels through liquids compared to some solids. 	<p>Solubility Transparency Conductivity Filter Evaporation Dissolving Sieving Reversible/irreversible</p>



	<p>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</p> <p><u>Assessment Opportunity</u></p> <p>Match examples of reversible and non reversible changes to the correct term. Explain the differences and similarities.</p>	<p>(Comparative and Fair Testing)</p> <p>- recording data and results of increasing complexity using scientific tables, bar and line graphs.</p> <p>This could be achieved by... drawing lines graphs to show the relationship between time and temperature of insulators. Drawing bar charts to show the hardness of the materials.</p> <p>(Pattern Seeking)</p>	<p>Electricity</p> <p>discuss particular materials suited to insulating or conducting electricity. E.g. Look at electrical plus/safety covers. Why do wires have plastic coating?</p>	
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	Scientific Knowledge	Scientific Skills	Vocabulary	
Year 6 Science	<p>Light</p> <p>Recognise that light appears to travel in straight lines</p> <p>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</p> <p>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</p> <p>Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them</p> <p>Know how simple optical instruments work. (periscope, telescope, binoculars, mirror, magnifying glass)</p> <p><u>Assessment Opportunity</u></p> <p>Use given diagrams to show the path of light to explain the pathways of light</p>	<p>Making systematic and careful observations and taking accurate measurements.</p> <p>This could be achieved by using data loggers to record light measure. (Pattern Seeking)</p> <p>Using test results to make predictions to set up further comparative and fair tests</p> <p>This could be achieved by... using knowledge of experiments from reflection to determine the best position of mirrors to complete a light maze/ periscope.</p> <p>(Comparative and Fair Testing)</p>	<p>Reflect</p> <p>Direction</p> <p>Refraction</p> <p>Light spectrum</p> <p>Beam</p> <p>Lens</p> <p>Iris</p> <p>Retina</p>	<p>pupils</p>
	<p>Animals including humans</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><u>Assessment Opportunity</u></p>	<p>Recording data and results of increasing complexity using tables, and classification keys.</p> <p>This could be achieved by... creating classification keys to describe how things are classified and justify their category based on their characteristics. This could be achieved through dissection of plants. Use microscopes to observe micro-organisms. (Grouping & Classifying)</p> <p>Identifying scientific evidence that has been used to support or refute ideas or arguments</p> <p>This could be achieved by... providing children with statements from different people</p>	<p>Circulatory system</p> <p>Aorta</p> <p>Ventricles</p> <p>Arteries</p> <p>Capillaries</p> <p>White/red blood cells</p>	<p>Bloodstream</p> <p>Drug substances</p> <p>Glucose</p> <p>Starch</p> <p>Trans and saturated fats</p> <p>Medicine</p>



		<p>and the children justify using their scientific knowledge to agree or disagree with the statements. (Research)</p>		
	<p>Living things and their habitats 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</p> <p>Give reasons for classifying plants and animals based on specific characteristics <u>Assessment Opportunity</u></p>	<p>Recording data and results of increasing complexity using tables, and classification keys. This could be achieved by... creating classification keys to describe how things are classified and justify their category based on their characteristics. This could be achieved through dissection of plants. Use microscopes to observe micro-organisms.</p> <p>(Grouping & Classifying) identifying scientific evidence that has been used to support or refute ideas or arguments This could be achieved by... providing children with statements from different people and the children justify using their scientific knowledge to agree or disagree with the statements. (Research)</p>	<p>Micro-organism Microbe Decay Exoskeleton Endoskeleton Bacteria</p>	<p>Virus mould</p>
	<p>Animals including humans 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 (Linked to SRE week/D&A week) Puberty and reproduction / relationships/conception and pregnancy Preventing early use <u>Assessment Opportunity</u></p>	<p>recording data and results of increasing complexity using scientific diagrams and labels This could be achieved by...labelling diagrams to show parts of the circulatory system (showing the parts). Can also use labels during heart dissection to show the parts of the heart.</p> <p>(Research) Reporting and presenting findings from enquiries, including conclusions, in oral and written forms such as displays and other presentations. This could be achieved by...an overview of different people’s lifestyles and comment on which people would be the most likely to have certain health issues/ conditions. More formal whole class presentations to share and report findings – discussion of confidence of findings.</p> <p>(Research & Observing) Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings where appropriate. This could be achieved by... using pulse meters and stop watches to record heart rate before, during and after exercise.</p>		



		(Observing)		
	<p>Electricity Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit Compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches</p> <p>Use recognised symbols when representing a simple circuit in a diagram <u>Assessment Opportunity</u></p>	<p>Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary. This could be achieved by... comparative tests using light/ sound and number of batteries/ cells in the circuit. Pupils create own questions – pupils challenge each other on if they are testable and offer advice to refine.</p> <p>(Comparative and Fair Testing) Using test results to make predictions to set up further comparative and fair tests This could be achieved by... comparative tests using light/ sound and number of batteries/ cells in the circuit.</p> <p>(Comparative and Fair Testing) Recording data and results of increasing complexity using scientific diagrams and charts. This could be achieved by drawing circuit diagrams showing how to increase brightness of bulbs. Create an alarm system to show increase in buzzer loudness.</p> <p>((Comparative and Fair Testing)</p>	<p>Voltage amp</p>	<p>Transformer Filament Energy Current Resistance Resistor Symbol</p>



Science at a Glance – Eastfield Primary School							
Autumn			Spring		Summer		
Year 1	Animals Including Humans Naming types of animals and parts of animals Seasonal Changes Changes in the weather (all year)		Everyday Materials (naming materials) Everyday Materials (properties of materials) Seasonal Changes Changes in the weather (all year)		Plants Name plants, including trees. Seasonal Changes Changes in the weather (all year)		
Year 2	Living Things and their Habitats Identify how living things are suited to their habitats		Uses of Everyday Materials Investigate the suitability of materials for their uses		Plants What do plants need to grow?	Animals Including Humans Notice that offspring grow into adults	
Year 3	Rocks Identify and classify a variety of rocks	Forces and Magnets Magnetic Forces		Light Sources of light/ shadows		Animals Including Humans Nutrition/ Investigating skeletons	Plants The function of different parts of a plant
Year 4	Living Things and their Habitats Group and classify living things Animals Including Humans Food Chains		Electricity Electrical circuits and components	Sound How sound is made	States of Matter Solids, liquids and gasses	Animals Including Humans (Digestive system/teeth)	
Year 5	Living Things and their Habitats Lifecycles	Animals Including Humans How humans change as they develop (PSHE)	Evolution and Inheritance How living things have adapted to suit their environments over time	Earth and Space The planets and the solar system	Forces The force of gravity/ air, water resistance and friction	Properties and Changes of Materials How materials change and can be separated	
Year 6	Light How light travels/how shadows are formed Animals Including Humans The Heart		Living Things and their Habitats Classifying living things		Animals Including Humans Reproduction	Electricity Variations in components	