SCIENCE CURRICULUM MAP

At Sheen Mount, we aim to treat all children as scientists by:

- *allowing them to develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics*
- *developing 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*
- *equipping children with the scientific knowledge required to understand the uses and implications of science, today and for the future*
- *building science capital by raising awareness of STEM careers and how science learning links to real life*
- *immersing children in wider science opportunities through visits and visitors, extra-curricular activities and home learning*

Purpose of study

A high-quality science education provides the foundations for understanding the world through the specific disciplines of biology, chemistry and physics. Science has changed our lives and is vital to the world's future prosperity, and all pupils should be taught essential aspects of the knowledge, methods, processes and uses of science. Through building up a body of key foundational knowledge and concepts, pupils should be encouraged to recognise the power of rational explanation and develop a sense of excitement and curiosity about natural phenomena. They should be encouraged to understand how science can be used to explain what is occurring, predict how things will behave, and analyse causes.

Aims

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.

Primary National Curriculum, Key Stages 1 and 2 Framework Document
September 2013

SCIENCE CURRICULUM MAP

	Autumn Term		Spring Term		Summer Term	
Reception Ongoing activities throughout year: observe effects on the body after physical exercise. Discuss healthy eating & balanced diets. Respond to, discuss & explore scientific events as they happen e.g. rain, ice, snow, fog, thunder, lightning. Water play - observe properties & behaviour of liquids.	Knowledge: know the importance for good health of physical exercise and a healthy diet, and talk about ways to keep healthy and safe. Explore changes in seasons. Skills: recognise and describe patterns. Make observations of animals and plants and explain why some things occur and talk about changes. Answer 'how' and 'why' questions about their experiences and in response to events. Vocabulary: food, drink, Autumn, leaves, eyes, hair, skin, similarities, differences, healthy living Key activities/events: 'All about me topic'.	Knowledge: explore what they can see, hear and feel in the night sky and link this to space. Learn about the sun, moon, stars and planets, looking at similarities and differences. Explore the job of an astronaut, and key figures in space exploration, and find out what life might be like on the ISS. Learn about space exploration in the past and design and make their own rockets. Name the planets of the solar system. Continue to explore seasonal changes and look for signs of Autumn and Winter. Skills: as for Autumn 1 Vocabulary: names of planets, space, rocket, constellation, Winter, sun, solar system, planets, orbit, rotates, star, space station, astronauts, gravity, oxygen, rocket, life Key activities/events: space topic. Learn about rockets & ISS. Name the planets. Make rockets & planets. Autumn walk to Sheen common looking for signs of Autumn	Knowledge: learn about animals and how they have adapted in different places, depending on their environment. They also learn about looking after and caring for the world. Skills: as for Autumn 1 + classifying animals including humans according to their characteristics. Vocabulary: camel, desert, panda, environment, suited/adapted, frozen desert, penguin , polar bear, similar, different Key activities/events: 'caring for our world' topic. Compare and contrast different world locations.	Knowledge: learn about dinosaurs and their habitats. Look at timelines and find out about the discovery of dinosaurs and significant palaeontologists. Learn about evolution and find out about famous scientists such as Charles Darwin and Mary Leakey. Skills: as for Autumn 1 + Classify dinosaurs according to their characteristics. Vocabulary: Herbivore, Carnivore, Omnivore, Fossil, Triassic, Jurassic, Cretaceous, scales, feathers, teeth, tail, claws, horn, extinct Key activities/events: Dinosaur topic - learn names, weights, heights etc. Classify into carnivores & herbivores. Spring walk to Sheen common looking for signs of Spring	Knowledge: note similarities and differences between different people and communities Skills: as for Autumn 1 Vocabulary: similarities, differences Key activities/events: engineering story time from STEM ambassador	Knowledge: learn about the difference between living and non-living matter, finding out about a range of animals and plants and their life cycles. Learn about the importance of caring for living things and the environment. They will be Through exploration in the outdoor area, learn about forces, sound and properties of materials. Skills: as for Autumn 1 + developing their skills of observation and description in talking about similarities and differences. Developing their skills of prediction, observation and problem solving. Vocabulary: Living, non-living, animals, plants, habitat, environment, undergrowth, life cycle. bugs, caterpillar, butterfly, bees, snails, insects and other language linked to the animals and habitats explored Key activities/events: 'Life in the undergrowth' topic - explore & classify vertebrates & invertebrates. Learn about habitats.

SCIENCE CURRICULUM MAP

	Autumn Term		Spring Term		Summer Term	
Year 1	**Animals including humans** Knowledge: identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense. Skills: use first-hand close observations to make detailed drawings. Name body parts correctly when talking about measurements and comparisons. Talk about their findings from investigations using appropriate vocabulary. Vocabulary: head, neck, arms, elbows, legs, knees, face, hair, mouth, teeth, senses, touch, see, smell, taste, hear, fingers, skin, eyes, nose, ears, tongue Key activities/events: senses walk, Look at photos of children as babies & make observations. Discuss & observe changes in humans as they get older. Investigate how to keep our body healthy through food and exercise. Design a healthy meal. **Seasonal changes** Knowledge: observe changes in Autumn. Observe and describe weather associated with Autumn and how day length varies. Skills: Use evidence gathered to describe the general types of weather and changes in day length over the seasons. Use evidence to describe some other features of their surroundings, themselves, animals, plants that change over the seasons. Vocabulary: weather (sunny, rainy, windy, snowy etc.), seasons (Winter, Summer, Spring, Autumn), sun, sunrise, sunset, day length	**Seasonal changes** Knowledge: Autumn continued & exploration & comparison with winter. Exploring what is different about winter through learning about changes to length of day. Look at the position of sun and earth, light and dark. Skills: as for Autumn Vocabulary: as for Autumn Key activities/events: compare Autumn and Winter. Look at differences in clothing and changes in noises and sounds we might hear. **Scientific enquiry skills** Skills: ask simple questions & recognise that they can be answered in different ways. Observe closely, using simple equipment. Perform simple tests. Use their observations & ideas to suggest answers to questions. Gather & record data to help in answering questions. Vocabulary: question, observe, test, predict, record Key activities/events: dissolving, surface tension & floating investigations.	**Everyday materials** Knowledge: 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. Skills: sort objects and materials using a range of properties. Begin to choose an appropriate method for testing a material for a particular property. Use their test evidence to answer questions about properties. Vocabulary: object, material, wood, plastic, glass, metal, water, rock, brick, paper, fabric, elastic, foil, card/cardboard, rubber, wool, clay, hard, soft, stretchy, stiff, bendy, floppy, waterproof, absorbent, breaks/tears, rough, smooth, shiny, dull, see through, not see through Key activities/events: explore different materials & their properties. Sort materials in a variety of ways & learn where materials come from (natural or man-made). Experiment with materials to design & test a boat (link to English text). Test materials for waterproofing & strength.	**Plants** Knowledge: identify & name a variety of common wild & garden plants, including deciduous & evergreen trees. Identify & describe the basic structure of a variety of common flowering plants, including trees. Skills: sort & group parts of plants using similarities & differences. Use simple charts etc. to identify plants. Collect information on features that change during the year. Use photographs to talk about how plants change over time Vocabulary: leaf, flower, blossom, petal, fruit, berry, root, seed, trunk, branch, stem, bark, stalk, bud, names of trees in the local area, names of garden and wild flowering plants in the local area Key activities/events: recall what children know about plants. Discuss what makes plants living things. Compare fruits, vegetables & other plants. Name parts of a plant/flower. Learn about the life cycle of a plant. Explore what plants/seeds need to grow well (link to English fact writing). Make a 'grass head'. Look at parts of a tree & the different types of trees. Keep a plant diary. **Seasonal changes** Knowledge: observe changes in Spring. Observe and describe weather	**Animals, including humans** Knowledge: identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals. Identify and name a variety of common animals that are carnivores, herbivores and omnivores. Explore life cycles of animals, how to classify and sort animals as well as learn about habitats and diet. Skills: sort and group animals using similarities and differences. Use simple charts etc. to identify unknown animals. Create a drawing of an imaginary animal labelling its key features. Use secondary resources to find out what animals eat, including talking to experts. Vocabulary: head, body, eyes, ears, mouth, teeth, leg, tail, wing, claw, fin, scales, feathers, fur, beak, paws, hooves Key activities/events: trip to London Zoo. Draw & label vertebrates into 5 main groups and other categories & criteria e.g. eating habits. Label basic parts of animals. Pond dipping. Explore life cycle of class animal. **Seasonal changes** Knowledge: as for Spring 2 Skills: as for Autumn	**Animals, including humans** Consolidation and continuation of the previous topic. Focus on diet, habitats & comparing animals from 2 different groups. **Seasonal changes** Knowledge: observe changes in Summer. Observe and describe weather associated with Summer and how day length varies. Skills: as for Autumn Vocabulary: as for Autumn Key activities/events: walk to Richmond Park looking at signs of Summer (if not completed in Summer 1). Look at shadows.

SCIENCE CURRICULUM MAP

	Key activities/events: Autumn walk. Make observations and comparisons.		**Seasonal changes** Knowledge: observe changes in Winter. Observe & describe weather associated with Winter and how day length varies. Skills: as for Autumn Vocabulary: as for Autumn Key activities/events: continue to compare Autumn and Winter. Look at changes in local weather.	associated with Spring and how day length varies. Skills: as for Autumn Vocabulary: as for Autumn Key activities/events: observe & compare how Winter turns to Spring, linking to plants. Walk to Richmond Park spotting signs of Spring (link to art).	Vocabulary: as for Autumn Key activities/events: look at changes in local weather. Observe changes in what animals & plants we see. Start to look at Summer.	

SCIENCE CURRICULUM MAP

	Autumn Term		Spring Term		Summer Term	
Year 2	**Scientific enquiry skills** Skills: ask simple questions & recognise that they can be answered in different ways. Observe closely, using simple equipment. Perform simple tests. Use their observations & ideas to suggest answers to questions. Gather & record data to help in answering questions. Build on skills from Y1. Focus on recording findings & learning what a fair test is. Vocabulary: question, observe, test, predict, record, fair test, pattern, variable, sort, identify, classify Key activities/events: make gloop. Friction experiments to support prediction skills. Odd one out activity. Walks around the school at different times of the day to gather information. Using microscopes.	**Uses of everyday materials** Knowledge: identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses. Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. Skills: Identifying and classifying. Fair testing. Sort materials using a range of properties. Explain using the key properties why a material is suitable or not suitable for a purpose. Choose an appropriate method for testing an object for a particular property. Use test evidence to select an appropriate material for a purpose. Vocabulary: as for Y1 + opaque, transparent and translucent, reflective, non-reflective, flexible, rigid, shape, push, pull, twist, squash, bend, stretch Key activities/events: explore how materials can be changed using a force. Recall properties of given materials. Identify & compare materials Think about which materials to use on a house (link to history - Great Fire of London). Build on children's understanding of waterproofing through absorbency. Experiment with heating & cooling materials. Explore recycling.	**Animals, including humans** Knowledge: notice that animals, including humans, have offspring which grow into adults. Find out about and describe the basic needs of animals, including humans, for survival (water, food and air). Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene. Skills: Research. Describe, including using diagrams, the life cycle of some animals, including humans, and their growth to adults. Measure/observe how animals, including humans, grow. Show what they know about looking after a baby/animal by creating a parenting/pet owners' guide. Explain how development and health might be affected by differing conditions and needs being met/not met. Vocabulary: offspring, reproduction, growth, child, young, old, exercise, heartbeat, breathing, hygiene, germs, disease Key activities/events: build on knowledge of animal groups from Y1. Sort animals using own criteria. Study the life cycle of humans & animals. Observe the life cycle of class animal (butterfly). Research & write about nocturnal & endangered animals (link to English). Learning what animals need to survive.	**Plants:** Knowledge: observe and describe how seeds and bulbs grow into mature plants. Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy. Skills: Observe over time. Spot similarities and differences between bulbs and seeds. Nurture seeds and bulbs into mature plants, identifying the different requirements of different plants. Vocabulary: as for Y1 + light, shade, sun, warm, cool, water, grow, healthy Key activities/events: fieldwork around school looking at & sorting types of plants. Recap plant part names & learn about their functions. Compare bulbs & seeds. Recall what plants need to survive & grow well. Grow a bean & keep a bean diary. Experiment about the effects of light on a plant. Predict & observe over time. Look at plants we eat.	**Living things and their habitats:** Knowledge: 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. Skills: Identifying and classifying. Research. Sort objects into living, dead and never lived. Give key features that mean the animal or plant is suited to its micro-habitat. Explain in simple terms why an animal or plant is suited to a habitat. Vocabulary: living, dead, never been alive, suited, suitable, basic needs, food, shelter, move, feed, names of local habitats Key activities/events: recap what makes something living. Sort objects into living, not living & never been alive. Explore habitats in the school environment, including micro-habitats. Explore extreme habitats e.g. desert, arctic, underwater, underground, urba. Look at effects of global warming & deforestation. Recall work linked to animal classification. Understand how animals are suited to their environment. Begin to look at basic adaptation. Consider the pros	**Living things and their habitats:** Knowledge: 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. Skills: Observe over time. As for Summer 1 + use a food chain to explain what animals eat. Vocabulary: as for Summer 1 + food chain, names of microhabitats Key activities/events: recap & and recall learning linked to habitats, in particular urban habitats and micro-habitats. Recall work on diet from Y1 & build on this using food chains. Create food chains & complete odd one out activities.

SCIENCE CURRICULUM MAP

			Learning about the importance of hygiene & how to stay healthy.		and cons of zoos. Create their own animal to show understanding of work.	

SCIENCE CURRICULUM MAP

	Autumn Term		Spring Term		Summer Term	
Year 3	**Light** Knowledge: 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 an opaque object. Find patterns in the way that the size of shadows change. Skills: describe patterns in visibility of different objects in different lighting conditions and predict which will be more or less visible as conditions change. Clearly explain, giving examples, that objects are not visible in complete darkness. Describe and demonstrate how shadows are formed by blocking light. Describe, demonstrate and make predictions about patterns in how shadows vary. Vocabulary: light, light source, dark, absence of light, transparent, translucent, opaque, shiny, matt, surface, shadow, reflect, mirror, sunlight, dangerous Key activities/events: Children explore what light is by using a cardboard box and torch. Children are introduced to the different types of light sources (natural and human made) and come up with their own using a table. Children complete different activities in order to investigate reflections. Children create their own puppet show in order to understand shadows and to	**Rocks** Knowledge: 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. Skills: classify rocks in a range of different ways, using appropriate vocabulary. Devise tests to explore the properties of rocks and use data to rank the rocks. Link rocks changing over time with their properties. Present in different ways their understanding of how fossils are formed. Identify plant/animal matter and rocks in samples of soil. Devise a test to measure the permeability of rocks. Vocabulary: rock, stone, pebble, boulder, grain, crystals, layers, hard, soft, texture, absorb water, soil, fossil, marble, chalk, granite, sandstone, slate, soil, sandy/ chalk/clay soil, permeable, impermeable, addition, losses, transition, transformation Key activities/events: classify rocks according to their properties. Observe, draw and describe rocks. Comparative test for permeability. Sequence the stages in fossil formation and match them to pictures.	**Animals, including humans** Knowledge: identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat. Identify that humans and some other animals have skeletons and muscles for support, protection and movement. Skills: classify foods into those that are high or low in particular nutrients. Answer questions about nutrients in food based on gathered evidence. Plan a daily diet and talk about its nutrient content. Give similarities and differences between skeletons. Vocabulary: nutrition, nutrients, carbohydrates, sugars, protein, vitamins, minerals, fibre, fat, water, skeleton, bones, muscles, support, protect, move, skull, ribs, spine, muscles, joints Key activities/events: Children look at the different food groups and learn how they enable the body to function, children then organise these food groups onto a health plate and provide example of each food group. Children make their own food diary with the focus of ensuring it is a well-balanced diet. Children learn about the skeleton and its 3 main	**Forces and magnets** Knowledge: compare how things move on different surfaces. Notice that some forces need contact between two objects, but magnetic forces can act at a distance. Observe how magnets attract or repel each other and attract some materials and not others. Compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials. Describe magnets as having two poles. Predict whether two magnets will attract or repel each other, depending on which poles are facing. Skills: Test the strength of difference magnets and make predictions. Use classification evidence to identify that some metals but not all are magnetic Through exploration, show how like poles repel and unlike poles attract and name unmarked poles. Use test data to rank magnets. Vocabulary: force, push, pull, twist, contact force, non-contact force, magnetic force, magnet, strength, bar magnet, ring magnet, button magnet, horseshoe magnet, attract, repel, magnetic material, metal, iron, steel, poles, north pole, south pole Key activities/events: Children test the strength of magnets using paperclips (how many paper clips can a	**Plants** Knowledge: identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers. Explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant. Investigate the way in which water is transported within plants. Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. Skills: explain observations made during investigations. Look at the features of seeds to decide on their method of dispersal. Draw and label a diagram of a flowering plant to show its parts, their role and the method of pollination and seed dispersal. Vocabulary: as for Y2 + photosynthesis, pollen, insect/wind pollination, seed formation, seed dispersal, wind dispersal, animal dispersal, water dispersal Key activities/events: trip to Kew Gardens, focusing on rainforest plants (link to geography) Children take part in a plant investigation (over time) which tests the effects of a plant having water, space, sunlight, warmth, air and soils. Then comparing it to plants with a missing element. Observations, recordings and discussions are made.	**Scientific enquiry skills** Skills: carry out practical activities which promote the 5 types of scientific enquiry: - Identifying and classifying - Observing over time - Fair testing - Pattern Seeking - Research Vocabulary: Plant Hunters, water, soil, sunlight, skeleton, Marie Curie, Journey to the Centre of the Earth, inner core, outer core, mantle, crust, light source. Key activities/events: Children learn about different inventors based on each topic they have covered throughout the year.

SCIENCE CURRICULUM MAP

	understand which materials are translucent and transparent.		functions, as well as identify the names of different bones. Children are introduced to the three different types of animal skeletons and have to sort the animals based on their skeleton type.	magnet hold). Children observe and draw these magnets, as well as fill in the results in a table. Children explore the different poles of magnets and label them. Children create freeze frames of different push and pull activities.		

SCIENCE CURRICULUM MAP

	Autumn Term		Spring Term		Summer Term	
Year 4	**States of matter** Knowledge: compare & group materials together, according to whether they are solids, liquids or gases. Observe that some materials change state when they are heated or cooled, & measure or research the temperature at which this happens in degrees Celsius (°C). Identify the part played by evaporation & condensation in the water cycle & associate the rate of evaporation with temperature. Skills: give reasons to justify why something is a solid, liquid or gas. Give examples of things that melt/freeze & how their melting points vary. From observations, give the melting points of some materials. Using test data, explain what affects how quickly a solid melts. Measure temperatures using a thermometer. Explain why condensation appears in different places. From test data, explain how to speed up or slow down evaporation. Present their learning about the water cycle in a range of ways. Vocabulary: solid, liquid, gas, state change, melting, freezing, melting point, boiling point, evaporation, temperature, water cycle, particle, condensation, water vapour Key activities/events: classify materials by state. Explore the presence of gases in other materials (e.g. bubbles in liquid). Coloured ice melting observation - measure temperature using thermometer. Observe hot water evaporating over time -use measuring cylinders to measure capacity of remaining liquid water.	**Electricity** Knowledge: identify common electrical appliances. Construct a simple series electrical circuit, identifying & naming its basic parts. Identify whether or not a lamp will light in a simple series circuit. Recognise that a switch opens and closes a circuit & associate this with whether or not a lamp lights in a simple series circuit. Recognise some common conductors & insulators, & associate metals with being good conductors. Learn about the basics of electrical safety. Skills: communicate structures of circuits using drawings which show how the components are connected. Use classification evidence to identify that metals are good conductors & non-metals are insulators. Add a circuit with a switch to a DT project & demonstrate how it works. Give reasons for choice of materials for making different parts of a switch. Make a switch & describe how their switch works. Vocabulary: electricity, electrical appliance/device, mains, plug, electrical circuit, complete circuit, component, cell, battery, positive, negative, connect/connections, loose connection, short circuit, crocodile clip, bulb, switch, buzzer, motor, conductor, insulator, metal, non-metal, symbol, current, power source Key activities/events: research electrical safety using	**Sound** Knowledge: identify how sounds are made, associating some of them with something vibrating. Recognise that vibrations from sounds travel through a medium to the ear. Find patterns between the pitch of a sound and features of the object that produced it. Find patterns between the volume of a sound and the strength of the vibrations that produced it. Recognise that sounds get fainter as the distance from the sound source increases. Skills: explain what happens when you strike a drum or pluck a string and use a diagram to show how sounds travel from an object to the ear. Demonstrate how to increase or decrease pitch and volume using musical instruments or other objects. Use data to identify patterns in pitch and volume. Explain how loudness can be reduced by moving further from the sound source or by using a sound insulating medium. Vocabulary: sound, source, vibrate, vibration, travel, pitch (high, low), volume, faint, loud, insulation, sound waves, amplitude Key activities/events: key vocabulary is consolidated in weekly music lessons. Conduct a sound walk observing sound around the school grounds. Use a wide variety of musical	**Animals, including humans** Knowledge: describe the simple functions of the basic parts of the digestive system in humans. Identify the different types of teeth in humans and their simple functions. Construct and interpret a variety of food chains, identifying producers, predators and prey. Skills: use diagrams or a model to describe the journey of food through the body, explaining what happens in each part. Record the teeth in their mouth (make a dental record). Explain the role of the different types of teeth. Explain how the teeth in animal skulls show they are carnivores, herbivores or omnivores. Create food chains based on research. Vocabulary: digestive system, digestion, mouth, teeth, saliva, oesophagus, stomach, small intestine, nutrients, large intestine, rectum, anus, teeth, incisor, canine, molar, premolars, herbivore, carnivore, omnivore, producer, predator, prey, food chain Key activities/events: visit to science museum including “It Takes Guts” show which demonstrates human digestive system graphically & in fun, engaging way. Use plasticine to create a model of their teeth. When	**Living things and their habitats** Knowledge: recognise that living things can be grouped in a variety of ways. Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment. Recognise that environments can change and that this can sometimes pose dangers to living things. Skills: keep a careful record of living things found in different habitats throughout the year (diagrams, tally charts etc.). Use classification keys to identify unknown plants and animals. Present their learning about changes to the environment in different ways. Vocabulary: classification, classification keys, environment, habitat, human impact, positive, negative, migrate, hibernate, movement, reproduction, sensitivity, nutrition, excretion, respiration, vertebrate, invertebrate Key activities/events: residential trip to Juniper Hall Field Studies Centre, including invertebrate hunting, pond dipping and small mammal trapping. Close study of habitat & adaptations of field mice, shrews & voles. Use of school pond for pond dipping & use of classification keys. Introduce MRS GREN. Produce closely observed scientific drawings of invertebrates (link to art).	**Scientific enquiry skills** Skills: ask relevant questions & use different types of scientific enquiries to answer them. Set up simple practical enquiries, comparative & fair tests. Make systematic & careful observations. Take accurate measurements using standard units, using a range of equipment. Gather, record, classify & present data in a variety of ways to help in answering questions. Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, & tables. Report on findings from enquiries, including oral & written explanations, displays or presentations of results & conclusions. Use results to draw simple conclusions, make predictions for new values, suggest improvements & raise further questions. Identify differences, similarities or changes related to simple scientific ideas & processes. Use straightforward scientific evidence to answer questions or to support their findings. Vocabulary: comparative test, fair test, pattern seeking, names of measuring equipment, predict, conclude Key activities/events: Y4 investigations from ‘It’s not fair or is it?’ book, including ‘body patterns’ - measure body parts using rulers/tape measures, record data & seek patterns in the data.

SCIENCE CURRICULUM MAP

	Water cycle collage (link to art & geography (mountains)).	secondary sources (link to computing). Predict & test whether different circuits will work. Fair test for conductors & insulators. Build a Narnia wardrobe with working lamp post, including creating their own switch (link to English and DT).	instruments to explore pitch & volume.	possible, we invite a local dentist in to speak.		

SCIENCE CURRICULUM MAP

Year 5	Autumn Term		Spring Term		Summer Term	
	Earth and space Knowledge: describe the movement of the Earth, and other planets, relative to the Sun in the solar system. Describe the movement of the Moon relative to the Earth. Describe the Sun, Earth and Moon as approximately spherical bodies. Use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky. Skills: use a model to explain how the Earth moves in relation to the Sun and the moon moves in relation to the Earth. Demonstrate and explain verbally how day and night occur. Explain evidence gathered about the position of shadows in term of the movement of the Earth. Show this using a model. Explain how a sundial works. Explain verbally, using a model, why we have time zones. Describe the arguments and evidence used by scientists in the past. Vocabulary: Earth, Sun, Moon, Mercury, Jupiter, Saturn, Venus, Mars, Uranus, Neptune, spherical, solar system, rotates, star, orbit, planets Key activities/events: Science Dome, phases of the moon shadow investigation.	**Forces** Knowledge: 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. Skills: investigate friction and explain the results of their investigations in terms of the force, showing a good understanding that as the object tries to move through the water or air or across the surface, the particles in the water, air or on the surface slow it down. Demonstrate clearly the effects of using levers, pulleys and gears. Vocabulary: as for Y3 + gravity, Earth, air resistance, water resistance, friction, mechanisms, simple machines, levers, pulleys, gears, Newtons (N), mass, weight Key activities/events: Air resistance parachute investigation with graphed results, Newton meter friction readings taken around the school, water resistance investigation with modelling clay.	**Properties and changes of materials** Knowledge: 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. Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic. Skills: create a chart or table grouping/comparing everyday materials by different properties. Use test evidence gathered about different properties to suggest an appropriate material for a particular purpose. Vocabulary: as for Y2 materials & Y4 states of matter + thermal/electrical insulator/conductor, change of state, mixture, dissolve, solution, soluble, insoluble, absorbent Key activities/events: classifying materials as conductors or insulators, testing the absorbency of a range of paper towels and comparing their 'value' with graphed results.	**Properties and changes of materials** Knowledge: 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. Demonstrate that dissolving, mixing and changes of state are reversible changes. 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. Skills: group solids based on their observations when mixing them with water. Give reasons for choice of equipment and methods to separate a given solution or mixture. Explain the results from their investigations involving dissolving and irreversible change. Vocabulary: as for Spring 1 + filter, sieve, reversible/ irreversible change, burning, rusting, new material Key activities/events: Making a solution of salt water and recovering the salt through evaporation, sieving/filtering/use of magnets to separate a range of mixtures	**Living things and their habitats** Knowledge: describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird. Describe different types of reproduction, including sexual and asexual reproduction in plants, and sexual reproduction in animals. Find out about the work of naturalists and animal behaviourists. Skills: present their understanding of the life cycle of a range of organisms in different ways. Identify patterns in life cycles. Compare two or more animal life cycles studied. Explain how a range of plants reproduce sexually and asexually. Vocabulary: as for Y2 animals & Y3 plants + life cycle, sexual, sperm, fertilisation, egg, live young, metamorphosis, asexual, plantlets, runners, bulbs, cuttings, stamen, carpel, sepal, petal Key activities/events: flower dissection	**Animals, including humans** Knowledge: examine the changes different animals (including humans) go through as they develop to old age. Learn about the changes experienced in puberty. Skills: research the gestation periods of other animals and compare them with humans. Find out and record the length and mass of a baby as it grows. Vocabulary: puberty, adolescence, gestation, foetus, penis, testes, ovary, uterus, cervix, vagina, menstruation/period, hormone Key activities/events: Compare gestation periods and graph results - make links to size of animal and gestation period.

SCIENCE CURRICULUM MAP

	Autumn Term		Spring Term		Summer Term	
Year 6	**Living things and their habitats** Knowledge: describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants and animals. Give reasons for classifying plants and animals based on specific characteristics. Skills: use classification materials to identify unknown organisms. Give a number of characteristics that explain why an organism belongs to a particular group. Use diagrams to illustrate their observations of organisms over time. Research organisms and scientists using secondary sources and communicate their findings to others. Compare and evaluate the classification systems of Aristotle & Linnaeus. Vocabulary: as for Y4 + bacterium/ bacteria, invertebrate, kingdom, microorganism, MRS GREN, organism, protist, virus Key activities/events: Science Dome visit – looking at miccroorganisms and Darwin (link to next topic). Sort organisms into the 5 kingdoms and justify their choices. Observe & record mould growth on bread over time. Use the MRS GREN test to decide whether different objects are living or non-living. Research & classify invertebrates and create an information booklet to share with younger children (link to English). Home learning: research a microbiologist and present their findings (link to English).	**Evolution and inheritance** Knowledge: recognise that living things have changed over time & 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 & are not identical to their parents. Identify how animals and plants are adapted to suit their environment in different ways & that adaptation may lead to evolution. Skills: use primary & secondary sources to research adaptations. Identify characteristics that make an organism suited to its habitat. Use models to demonstrate inheritance & natural selection. Compare & evaluate theories of Ancient Greeks, Wallace & Darwin. Identify evidence which supports/refutes theory of evolution. Use Venn diagram to sort characteristics caused by genes & environment. Vocabulary: adaptation, evolution, inheritance, natural selection, offspring, reproduction, species, variation Key activities/events: trip to Kew Gardens – focus on plant evolution. Model inheritance using 'reebops'. Model natural selection using drama. Learn about the work of Mary Anning and recreate a prehistoric animal using fossil evidence. Research animal adaptations & present their findings in a	**Light** Knowledge: recognise that light appears to travel in straight lines. Use this idea to explain that objects are seen because they give out or reflect light into the eye. Use this idea to explain why shadows have the same shape as the objects that cast them. Explain that we see things because light travels from light sources to our eyes or from light sources to objects & then to our eyes. Skills: explain how evidence from enquiries shows that light travels in straight lines. Predict & explain with diagrams or models how the path of light rays can be directed by reflection to be seen. Measure angles of incidence & reflection accurately, record this data in a diagram & table, & draw a conclusion from their results. Use secondary sources to find out how the human eye works. Vocabulary: as for Y3 + ray, refraction, spectrum, angle of incidence/reflection, cornea, iris, pupil, lens, retina, sclera, optic nerve Key activities/events: demonstrate that light travels in straight lines by passing beam of light through series of holes. Draw diagrams to explain how we are able to see objects. Write an explanatory text about the workings of the human eye (link to English). Investigate	**Electricity** Knowledge: associate the brightness of a lamp or the volume of a buzzer with the number & voltage of cells used in the circuit. Compare & give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers & the on/off position of switches. Use recognised symbols when representing a simple circuit in a diagram. Skills: incorporate a switch into a circuit to turn it on & off. Change cells & components in a circuit to achieve a specific effect. Communicate structures of circuits using circuit diagrams with recognised symbols. Devise & carry out a fair test on resistance & draw a conclusion from their results. Predict results & answer questions by drawing on evidence gathered. Use knowledge of conductors & insulators to design, build & test a switch. Vocabulary: as for Y4 + circuit diagram, circuit symbol, voltage, resistance Key activities/events: design & make their own switch (link to DT). Build circuits with different numbers of cells, bulbs & motors to investigate the effect on the other components. Fair test – does the length of resistance wire in a circuit affect the amount of current?	**Animals, including humans** Knowledge: identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood. Skills: communicate their understanding of the circulatory system in writing & with a labelled diagram. Devise & carry out a fair test to discover the link between pulse rates & activity. Measure results accurately, record them in a graph & use them to draw conclusions. Vocabulary: heart, pulse, rate, blood, blood vessels, lungs, oxygen, nutrients, water, muscles, circulatory system, vein, artery, capillary, oxygenated/deoxygenated blood Key activities/events: fair test to examine link between pulse rate & activity. Heart dissection.	**Animals, including humans** Knowledge: describe the ways in which nutrients and water are transported within animals, including humans. Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function. Skills: explain both the positive and negative effects of diet, exercise, drugs and lifestyle on the body. Present information describing impact of drugs and lifestyle on the body. Vocabulary: nutrients, water, muscles, diet, exercise, drugs, lifestyle Key activities/events: create a poster demonstrating lifestyle choices which can have a positive/negative impact on health.

SCIENCE CURRICULUM MAP

		poster. Home learning: design a fantasy adapted animal & explain how it is suited to its habitat.	angles of incidence & reflection. Learn about Newton's theory of colour.			