



**Sheringdale Science Medium Term Plan
KS1 and KS2**

Created by Zoe Traviss (Science Leader) July 2021. To be reviewed July 2022.

Year: 1

Term: Autumn

Topic : Magnificent Me

<p>Science NC program of study</p>	<p>Humans (BIOLOGY) 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> <p>Pupils might work scientifically by: using their observations to compare and contrast animals at first hand or through videos and photographs, describing how they identify and group them.</p>	<p>Animals (BIOLOGY) Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals Identify and name a variety of common animals that are carnivores, herbivores and omnivores Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets)</p> <p>Pupils might work scientifically by: using their observations to compare and contrast animals at first hand or through videos and photographs, describing how they identify and group them; grouping animals according to what they eat; and using their senses to compare different textures, sounds and smells.</p>
<p>topic link</p>	<p>Naming body parts and understanding of ourselves as Year 1 children. Changes from EYFS, understanding step up from reception. Black History Month inventor - Lonnie Johnson (super-soaker)</p>	<p>Comparing ourselves to animals, understanding what makes us human.</p>

Year: 1

Term: Spring

Topic : All Aboard..!

<p>Science NC program of study</p>	<p>Everyday Materials (CHEMISTRY) Distinguish between an object and the material from which it is made. Identify and name a variety of everyday materials, including wood, plastic and 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>Pushes and Pulls (PHYSICS) (<i>non-statutory unit</i>)</p> <p>That there are many sorts of movement which can be described in many ways. To observe and describe different ways of moving. That pushing or pulling things can make objects start or stop moving. To identify similarities and differences between the movement of different objects. To make suggestions about how objects can be made to move and to</p>
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	Pupils might work scientifically by: performing simple tests to explore questions, for example: What is the best material for an umbrella? ...for lining a dog basket? ...for curtains? ...for a bookshelf? ...for a gymnast's leotard?	find out whether they were right. To recognise hazards and risks to themselves in moving objects. That it is not only us that make things move by pushing. To ask questions about what is causing movement.
topic link	Labelling boats and other water vessels. Suitability of materials. Material for making a sail? Waterproof.	Different forces on a ship e.g. pulling of sail. Look at forces against other modes of transport

Year: 1
Term: Summer

Topic : Food Glorious Food

Science NC program of study	Plants (BIOLOGY) 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. Pupils might work scientifically by: observing closely, perhaps using magnifying glasses, and comparing and contrasting familiar plants; describing how they were able to identify and group them, and drawing diagrams showing the parts of different plants including trees. Pupils might keep records of how plants have changed over time, for example the leaves falling off trees and buds opening; and compare and contrast what they have found out about different plants.	Seasonal Change PHYSICS Observe changes across the four seasons (focus Spring and Summer) Observe and describe weather associated with the seasons and how day length varies. Pupils might work scientifically by: observing and talking about changes in the weather and the seasons. Note: Pupils should be warned that it is not safe to look directly at the Sun, even when wearing dark glasses. Pupils should make tables and charts about the weather; and make displays of what happens in the world around them, including day length, as the seasons change.
topic link	Growing food. Farming in the UK.	What food grows in different seasons? Life cycle of a caterpillar (hands on observations) – link to art Summer 1

Tier 1 (every lesson words)

Question	sort	group	compare	differences
Answer	similarities	describe	measurements	tests
Observe	record			
Observing Equipment Identify				

Tier 2 (topic linked words)

sight, smell, touch, taste, hearing, head, nose, ear, neck, shoulder, arm, elbow, wrist, hand, back, chest, hip, leg, knee, ankle, foot wing, beak, tail, fin, wood, plastic, glass, paper, metal, rock, hard, soft, rough, smooth, shinny, dull, bendy, stiff, leaf, flower, fruit, seed, roots, trunk, branches season, spring, summer, autumn, winter, month, year, day, night, sun, moon, light, dark, hard, soft, stretchy, stiff, shiny, dull, rough, smooth, bendy/not bendy, waterproof/not waterproof, push, pull, magnet

Tier 3 (technical, low frequency words)

Autumn - Animals including Humans

Amphibians, fish, reptiles, mammals, birds (+ 1 example of each)
herbivore, omnivore, carnivore

Spring - Everyday Materials & Pushes and Pulls

absorbent, opaque,

Summer - Plants

deciduous, evergreen, tree,
blossom, petals, bulb
stem

Year: 2

Term: Autumn

Topic : Fire and Ice

<p>Science NC program of study</p>	<p>Uses of Everyday Materials (CHEMISTRY) 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. Pupils might work scientifically by: comparing the uses of everyday materials in and around the school with materials found in other places (at home, the journey to school, on visits, and in stories, rhymes and songs); observing closely, identifying and classifying the uses of different materials, and recording their observations.</p>	<p>Inventions: Extreme weather (additional unit) (3 weeks) Working Scientifically (additional unit) (3weeks) Observe and discuss weather inventions used around the world. Find out how people record weather using sun dials, wind directions and rain collectors. Define extreme weather and identify past extreme weather events Understand the causes of extreme weather events and the impact these can have Think, respond and reflect creatively with regard to different sources and stimuli Pupils can work scientifically by: Asking simple questions and recognising that they can be answered in different ways Observing closely, using simple equipment Performing simple tests Identifying and classifying. Using observations and ideas to suggest answers to questions Gather and recording data to help answer questions</p>
<p>topic link</p>	<p>Clothes that keep you warm. Things that burn, fire-resistant materials, safety around fire (teacher-led), link to history 'Fire of London' Black History Month inventor – Garret Morgan (safety-hood during fire, gas mask, 3 light traffic signal)</p>	<p>Winter, icy, snow, weather conditions. Link to great fire of London Link with English texts on Antarctica</p>

Year: 2

Term: Spring

Topic : Heroes of the World

<p>Science NC program of study</p>	<p>Electricity (PHYSICS) <i>(non-statutory unit)</i></p> <p>Identify appliances which use electricity and those which do not. Record the appliances in categories and justify the groupings eg say that the tape recorder and the radio both make sounds.</p> <p>Tell someone <i>eg visitor, parent, other child</i> that mains sockets are dangerous <i>eg the electricity is so powerful it could kill you</i> and that plugs should not be touched with wet hands. Use devices with batteries, draw and label some of these. Explain why a particular device requires a particular battery <i>eg a watch is very small so it needs a small battery.</i> Identify ways batteries might be dangerous <i>eg a small child might swallow one, if the battery were cut open the chemicals could escape and cause harm.</i> Make working circuits using bulbs and/or buzzers and make drawings of these. Recognise simple drawings of circuits which will not work <i>eg with connections to only one terminal of battery or a circuit with a break</i> and explain why the bulb will not light. Interpret drawings of circuits making correct predictions of which circuits will work and explaining these <i>eg saying this won't work because both wires are attached to the same end of the battery.</i> Design, make, test and demonstrate a device and explain the importance of a complete circuit in it.</p>	<p>Plants (BIOLOGY)</p> <p>Observe and describe how seeds and bulbs grow into mature plants. Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.</p> <p>Pupils might work scientifically by: observing and recording, with some accuracy, the growth of a variety of plants as they change over time from a seed or bulb, or observing similar plants at different stages of growth; setting up a comparative test to show that plants need light and water to stay healthy.</p>
<p>topic link</p>	<p>Make reference to Benjamin Franklin (discovered link between lightning and electricity)</p>	<p>Different plants around the world. Tropical plants versus temperate.</p>

Year: 2

Term: Summer

Topic : Location Location!

<p>Science NC program of study</p>	<p>Animals, Including Humans (BIOLOGY)</p> <p>Notice that animals, including humans, have offspring which grow into adults.</p> <p>Find out about and describe the basic needs of animals, including humans, for survival (water, food and air).</p> <p>Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.</p> <p>Pupils might work scientifically by: observing, through video or first-hand observation and measurement, how different animals, including humans, grow; asking questions about what things animals need for survival and what humans need to stay healthy; and suggesting ways to find answers to their questions.</p>	<p>Living things and their habitats (BIOLOGY)</p> <p>Explore and compare the differences between things that are living, dead, and things that have never been alive.</p> <p>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.</p> <p>Identify and name a variety of plants and animals in their habitats, including microhabitats.</p> <p>Describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food.</p> <p>Pupils might work scientifically by: sorting and classifying things according to whether they are living, dead or were never alive, and recording their findings using charts. They should describe how they decided where to place things, exploring questions like: 'Is a flame alive? Is a deciduous tree dead in winter?' and talk about ways of answering their questions. They could construct a simple food chain that includes humans (eg, grass, cow, human). They could describe the conditions in different habitats and microhabitats (under log, on stony path, under bushes); and find out how the conditions affect the number and type(s) of plants and animals that live there.</p>
<p>topic link</p>	<p>Pets and care of animals in our community.</p>	<p>River Wandle, local environment and walk around.</p>

Tier 1 (every lesson words)

Question	sort	group	compare	differences
Answer	similarities	describe	measurements	tests
Observe	record			
Chart	Observing Equipment	Identify		

Tier 2 (topic linked words)

Pictogram, property, solid, waterproof, squash, bend, flexible, twist, stretch push, pull, roll, slide, bounce, Waterproof, fabric, rubber, cars, rock, paper, cardboard, wood, metal, plastic, glass, brick, twisting, squashing, bending, matches, cans, spoons, Tally Chart, living, dead, never alive, food, food chain, leaf litter, shelter, seashore, woodland, ocean, rainforest, conditions, desert, damp, shade, classify, rain, hail, snow, tornado, hurricane, tsunami, sun, heat wave, light, battery, cell, wire, buzzer, bulb, electricity, electrical circuit, circuit,

Tier 3 (technical, low frequency words)

Autumn - Uses of everyday materials

absorbent, opaque, transparent, translucent,

Spring - Physics and Plants

growth, germinate, light, temperature, reproduce, lifecycle, seedling, current, insulator, conductor

Summer - Animals including Humans and Living things and their habitats

habitats, micro-habitats, off- spring, predator, prey

Year: 3

Term: Autumn

Topic : Stones and Bones

<p>Science NC program of study</p>	<p>Animals including Humans (BIOLOGY) 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.</p> <p>Pupils might work scientifically by: identifying and grouping animals with and without skeletons and observing and comparing their movement; exploring ideas about what would happen if humans did not have skeletons. They might compare and contrast the diets of different animals (including their pets) and decide ways of grouping them according to what they eat. They might research different food groups and how they keep us healthy, and design meals based on what they find out.</p>	<p>Rocks (CHEMISTRY) Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties. Describe in simple terms how fossils are formed when things that have lived are trapped within rock. Recognise that soils are made from rocks and organic matter.</p> <p>Pupils might work scientifically by: observing rocks, including those used in buildings and gravestones, and exploring how and why they might have changed over time; using a hand lens or microscope to help them to identify and classify rocks according to whether they have grains or crystals, and whether they have fossils in them. Pupils might research and discuss the different kinds of living things whose fossils are found in sedimentary rock and explore how fossils are formed. Pupils could explore different soils and identify similarities and differences between them and investigate what happens when rocks are rubbed together or what changes occur when they are in water. They can raise and answer questions about the way soils are formed.</p>
<p>topic link</p>	<p>Link to prehistoric man, diet, lifestyle. Black History Month inventor – Mary Van Brittan Brown (home security system)</p>	<p>Follow history focus in Autumn 1, rocks link to different stages of history, fossils, geology.</p>

Year: 3

Term: Spring

Topic : Marvellous Inventions

<p>Science NC program of</p>	<p>Light (PHYSICS) Recognise that they need light in order to see things and that dark is</p>	<p>Exploring Inventors (Additional unit) Children work to explore the global impact of fossil fuels on global</p>
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study	<p>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 sizes of shadows change.</p> <p>Pupils might work scientifically by: looking for patterns in what happens to shadows when the light source moves or the distance between the light source and the object changes.</p>	<p>warming. Children look at how renewable energy is helping to combat climate change and have a positive impact on the world. Children will explore prominent global figures, including Greta Thunberg, and look at the work they are doing.</p> <p>Through exploration of ideas, research opportunities and presentations, children might work scientifically by: asking relevant questions and using different types of scientific enquiries to answer them. Identify differences, similarities or changes related to simple scientific ideas and processes using straightforward scientific evidence to answer questions or to support their findings</p>
topic link	<p>Make reference to invention of the lightbulb (Thomas Edison) Make links with RE – Diwali and other festivals and their uses of light.</p>	<p>Fossil fuels - Renewable energy and climate change.</p> <p>E.g. could take a look at how power sources have developed through time and why. Focus upon the development of alternatives to fossil fuels e.g. Tesla (electric car Elon Musk), Victor Ochoa (windmill, Ochoaplane) could link to work of William Kamkwamba (brought electricity to village via windmill).</p>

Year: 3

Term: Summer

Topic : The Romans Rule

<p>Science NC program of study</p>	<p>Plants (BIOLOGY) 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.</p>	<p>Forces and Magnets (PHYSICS) – Building on from Year 1 Compare how things move on different surfaces Notice that some forces need contact between 2 objects, but magnetic forces can act at a distance. Observe how magnets attract or repel each 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 2 poles.</p>
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	<p>Pupils might work scientifically by: comparing the effect of different factors on plant growth, for example, the amount of light, the amount of fertiliser; discovering how seeds are formed by observing the different stages of plant life cycles over a period of time; looking for patterns in the structure of fruits that relate to how the seeds are dispersed. They might observe how water is transported in plants, for example, by putting cut, white carnations into coloured water and observing how water travels up the stem to the flowers.</p>	<p>Predict whether 2 magnets will attract or repel each other, depending on which poles are facing.</p> <p>Pupils might work scientifically by: comparing how different things move and grouping them; raising questions and carrying out tests to find out how far things move on different surfaces, and gathering and recording data to find answers to their questions; exploring the strengths of different magnets and finding a fair way to compare them; sorting materials into those that are magnetic and those that are not; looking for patterns in the way that magnets behave in relation to each other and what might affect this, for example, the strength of the magnet or which pole faces another; identifying how these properties make magnets useful in everyday items and suggesting creative uses for different magnets.</p>
<p>topic link</p>	<p>Roman plants brought to Britain (fruit and veg), Roman agriculture.</p>	<p>Onagers (Roman catapult), Roman building and construction (roads, forts, aqueducts)</p>

Tier 1 (every lesson words)

Question	Equipment sort	Identify	group	compare	differences
Answer		similarities		describe	measurements tests
Observe		record			
Observing		Sensible questions, predict, observation, research, fair test, accurate, measure, classify, diagrams, graphs, tables, charts, conclusion, explain			

Tier 2 (topic linked words)

Nutrition, nutrients, carbohydrates, sugars, protein, vitamins, minerals, fibre, fat, water, skeleton, bones, muscles, support, protect, skull, ribs, spine, muscles, joints, Rock, stone, pebble, boulder, grain, crystals, layers, hard, soft, texture, absorb water, soil, fossil, marble, chalk, soil, sandy/chalk/clay soil, light, light source, darkness, reflect, reflective, mirror, shadow, block, direction, Force, push, pull, twist, magnet, strength, metal, iron, steel, poles, north pole, south pole, air, light, water, nutrients, soil, support, anchor, flower, energy, growth, seedling, carbon dioxide, oxygen, sugar, material,

Tier 3 (technical, low frequency words)

Autumn - Animals including Humans and Rocks

Sandstone
Peat
Marble
Granite
Slate
endoskeleton, exoskeleton, hydrostatic skeleton, vertebrates, invertebrates

Spring - Light

Transparent, translucent, opaque, rays

Summer - forces and magnets and plants

Non-contact force, magnetic force, bar magnet, ring magnet, button magnet, horseshoe magnet, attract, repel, magnetic material, contact force, magnetic field, reproduction, pollination, dispersal, transportation, photosynthesis, chlorophyll

Year: 4

Term: Autumn

Topic : Buckle up! Life's a journey

<p>Science NC program of study</p>	<p>States of Matter (CHEMISTRY)</p> <p>Compare and group materials together, according to whether they are solids, liquids or gases.</p> <p>Observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C).</p> <p>Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.</p> <p>Pupils might work scientifically by: grouping and classifying a variety of different materials; exploring the effect of temperature and taking accurate measurements using standard units on substances such as chocolate, butter, cream (for example, to make food such as chocolate crispy cakes and ice-cream for a party). They could research the temperature at which materials change state, for example, when iron melts or when oxygen condenses into a liquid. They might observe and record evaporation over a period of time, for example, a in the playground or washing on a line, and investigate the effect of temperature on washing drying or snowmen melting.</p>	<p>Electricity (PHYSICS)</p> <p>Identify common appliances that run on electricity (revising and building on Year 2 learning).</p> <p>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 is part of a complete loop with a battery.</p> <p>Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit.</p> <p>Recognise some common conductors and insulators, and associate metals with being good conductors.</p> <p>Pupils might work scientifically by: observing patterns, for example, that bulbs get brighter if more cells are added, that metals tend to be conductors of electricity, and that some materials can and some cannot be used to connect across a gap in a circuit.</p>
<p>topic link</p>	<p>Consolidate State of Matter (three weeks) link to water cycle, evaporation Particles, liquids, solids and gases travel.</p> <p>Black History Month inventor – James E West (co-invented electric microphone)</p>	<p>Electricity travelling through a circuit. Experiment with producing electronic sound and buzzers (progression from Autumn 1).</p> <p>Make reference to Archimedes (link to Greece).</p>

Year: 4

Term: Spring

Topic : Blue Abyss

<p>Science NC program of study</p>	<p>Sound (PHYSICS) 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.</p> <p>Pupils might work scientifically by: finding patterns in the sounds that are made by different objects such as saucepan lids of different sizes or elastic bands of different thicknesses. They might make earmuffs from a variety of different materials to investigate which provides the best insulation against sound. They could make and play their own instruments by using what they have found out about pitch and volume.</p>	<p>Consolidate State of Matter (three weeks) Exploring Inventors (Additional unit) Pupils might work scientifically by: asking relevant questions and using different types of scientific enquires to answer them. Gathering, recording, classifying and presenting data in a variety of ways to help answer questions. Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables. Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions. Identifying differences, similarities or changes related to simple scientific ideas and processes. Using straightforward scientific evidence to answer questions or to support their findings.</p>
<p>topic link</p>	<p>The journey of sound, importance of sound and silence in religion. Black History Month inventor – James E West (co-invented electric microphone)</p>	<p>Investigate the lightbulb including the work of Thomas Edison, Nikola Tesla and Lewis Latimer. Alexander Graham Bell (link to sound/telephone) Marine inventions - Lord Kelvin (mariner compass), Ernest Everett Just (marine biologist).</p>
<p>Year: 4 Term: Summer</p>		
<p>Topic : Sands of Time</p>		
<p>Science NC program of study</p>	<p>Animals, Including Humans (BIOLOGY) 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</p>	<p>Living things and their habitats (BIOLOGY) Building on KS1 learning. 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</p>

	<p>functions.</p> <p>Construct and interpret a variety of food chains, identifying producers, predators and prey.</p> <p>Pupils might work scientifically by: comparing the teeth of carnivores and herbivores and suggesting reasons for differences; finding out what damages teeth and how to look after them. They might draw and discuss their ideas about the digestive system and compare them with models or images.</p>	<p>Recognise that environments can change and that this can sometimes pose dangers to living things.</p> <p>Pupils might work scientifically by: using and making simple guides or keys to explore and identify local plants and animals; making a guide to local living things; raising and answering questions based on their observations of animals and what they have found out about other animals that they have researched.</p>
topic link	<p>Ancient Egyptians and mummification. Link to teeth as archaeological evidence.</p>	<p>Harsh desert environment. Touch on environmental change and extinction of animals.</p>

Tier 1 (every lesson words)				
Question	sort	group	compare	differences
Answer	similarities	describe	measurements	tests
Observe	record	secondary sources, comparative tests, fair tests, careful, accurate, observations, equipment, gather, measure, record, data, evidence, results, keys, bar charts, table, results, conclusions, predictions, support, thermometers		
	Observing Equipment Identify			

Tier 2 (topic linked words)

States of matter, solid, liquid, gas, air, oxygen, powder, grainular/grain, crystals, change state, ice/water/steam, heating, cooling, temperature, degrees celcius, melt, freeze, solidify, melting point, boil, boiling point, Electricity, appliance, device, mains, plug, electrical circuit, complete circuit, circuit diagram, circuit symbol, components, cell, battery, positive/negative, connect, connection, short circuit, wire, crocodile clip, bulb, bright/dim, switch, buzzer, motor, faster/slower, metal/non metal, sound, sound source, noise, vibration, travel, solid, liquid, gas, pitch, tune, high, low, volume, loud, quiet, fainter, muffle, strength of vibrations, insulation, instrument, percussion, strings, bass, woodwind, tuned instrument, digestive system, nutrition, mouth, teeth, tongue, rip, tear, chew, grind, cut,

<u>Tier 3 (technical, low frequency words)</u>	<u>Spring - sound</u>	<u>Summer - animals including humans and living things and their habitats</u>
<u>Autumn - states of matter</u> Vapour Evaporation Condensation Precipitation Transpiration Water cycle Conductor Insulator	Amplitude	canine, incisor, molar, pre-molar, saliva, oesophagus (gullet), stomach, s mall intestine, large intestine, rectum, anus, carnivore, herbivore, omnivore, producer, consumer, predator, prey, food chain

Year: 5

Term: Autumn

Topic : Laudable London

<p>Science NC program of study</p>	<p>Earth and Space (PHYSICS)</p> <p>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.</p> <p>Pupils might work scientifically by: comparing the time of day at different places on the Earth through internet links and direct communication; creating simple models of the solar system; constructing simple shadow clocks and sundials, calibrated to show midday and the start and end of the school day; finding out why some people think that structures such as Stonehenge might have been used as astronomical clocks.</p>	<p>Living things and their habitats (BIOLOGY)</p> <p>Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird Describe the life process of reproduction in some plants and animals.</p> <p>Pupils should study and raise questions about their local and London environment throughout the year. They should find out about the work of naturalists and animal behaviourists, for example, David Attenborough and Jane Goodall. Pupils should find out about different types of reproduction, including sexual and asexual reproduction in plants, and sexual reproduction in animals.</p> <p>Pupils might work scientifically by: observing and comparing the life cycles of plants and animals in their local environment with other plants and animals around the world (in the rainforest, in the oceans, in desert areas and in prehistoric times), asking pertinent questions and suggesting reasons for similarities and differences. They might try to grow new plants from different parts of the parent plant, for example, seeds, stem and root cuttings, tubers, bulbs. They might observe changes in an animal over a period of time (for example, by hatching and rearing chicks), comparing how different animals reproduce and grow.</p>
<p>topic link</p>	<p>Greenwich Meridian, sailors navigating by the stars. Black History Month inventor - Katherine Johnson, Dorothy Vaughan and Mary Jackson (NASA)</p>	<p>Local study of habitats and animals found in London and surrounding areas. Parakeets, foxes and their success in London? Plant species that thrive in London eg. Japanese Knotweed.</p>

Year: 5

Term: Spring

Topic : Champions of Change

<p>Science NC program of study</p>	<p>Forces (PHYSICS)</p> <p>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.</p> <p>Pupils might work scientifically by: exploring falling paper cones or cupcake cases, and designing and making a variety of parachutes and carrying out fair tests to determine which designs are the most effective. They might explore resistance in water by making and testing boats of different shapes. They might design and make products that use levers, pulleys, gears and/or springs and explore their effects.</p>	<p>Exploring Inventors (Additional unit)</p> <p>Pupils might work scientifically by: identifying scientific evidence that has been used to support or refute ideas or arguments.</p>
<p>topic link</p>	<p>Who are the champions of change? A study of significant inventions during Industrial Revolution including Louis Pasteur, Alfred Nobel, Henry Bell and Elijah McCoy (steam train and lubrication), Elias Howe (sewing machine) could make comparisons with more functional inventions such as Josephine Cochrane (dishwasher) or Nancy Johnson (ice-cream maker) – same period but completely different use.</p>	<p>Significant inventions during Industrial Revolution including Louis Pasteur, Alfred Nobel, Henry Bell and Elijah McCoy (steam train and lubrication), Elias Howe (sewing machine) could make comparisons with more functional inventions such as Josephine Cochrane (dishwasher) or Nancy Johnson (ice-cream maker).</p>

Year: 5

Term: Summer

Topic : Raiders and Traders

<p>Science NC program of study</p>	<p>Animals, including Humans (BIOLOGY)</p> <p>Describe the changes as humans develop to old age.</p> <p>Pupils should draw a timeline to indicate stages in the growth and development of humans. They should learn about the changes</p>	<p>Properties and Changes of Materials (CHEMISTRY)</p> <p>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,</p>
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	<p>experienced in puberty.</p> <p>Pupils could work scientifically by: researching the gestation periods of other animals and comparing them with humans; by finding out and recording the length and mass of a baby as it grows.</p> <p>SRE</p> <p>Objectives from PSHE map:</p> <p>Explain how boys and girls change during puberty and why looking after myself physically and emotionally is important. I can also summarise the process of conception.</p> <p>Express how I feel about the changes that will happen to me during puberty, and that I accept these changes might happen at different times to my friends.</p>	<p>and describe how to recover a substance from a solution</p> <p>Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating</p> <p>Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic</p> <p>Demonstrate that dissolving, mixing and changes of state are reversible changes</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>Pupils might work scientifically by: carrying out tests to answer questions, for example, ‘Which materials would be the most effective for making a warm jacket, for wrapping ice cream to stop it melting, or for making blackout curtains?’ They might compare materials in order to make a switch in a circuit. They could observe and compare the changes that take place, for example, when burning different materials or baking bread or cakes. They might research and discuss how chemical changes have an impact on our lives, for example, cooking, and discuss the creative use of new materials such as polymers, super-sticky and super-thin materials.</p>
<p>topic link</p>	<p>How very old and young do not have the same strength/resilience as adults, therefore could not survive the same conditions.</p>	<p>Dried food for expeditions and rations.</p> <p>Filtering and purifying water for survival.</p> <p>Materials for Andersen shelters and different forms of shelter in WWII, uniforms.</p>

Tier 1 (every lesson words)

Question sort group compare differences Answer similarities describe measurements tests Observe record secondary sources, comparative tests, fair tests, careful, accurate, observations, equipment, gather, measure, record, data, evidence, results, keys, bar charts, table, results, conclusions, predictions, support, thermometers
Observing independent variable, dependent variable, controlled variable, accuracy, precision, degree of trust, classification keys, scatter graphs, line graphs, causal relationships, support/refute, data logger Equipment Identify

Tier 2 (topic linked words)

Earth, Sun, Moon, Axis, Rotation, Day, Night, Phases of the Moon, star, planets, solar system, day, night, life cycle, insect, bird, fish, reptile, eggs, live young, all, Earth, gravity, weight, mass, air resistance, water resistance, friction, moving surfaces, mechanisms, levers, pulleys, gears, force, transfers, Baby, Toddler, Teenager, Elderly, Growth, Development, Solid, liquid, gas, particles, state, materials, properties, matter, melt, freeze, water, ice, temperature, process, condensation, evaporation, water vapour, energy, collection, rigid, hard, soft, stretchy, flexible, waterproof, melting, dissolve, burning, rustling,

Tier 3 (technical, low frequency words)

Autumn - Earth and Space and living things and their habitats

constellation, waxing, waning, crescent, gibbous. Mercury, Venus, Mars, Jupiter, Saturn, Uranus, Neptune, rotate, orbit, axis, spherical, geocentric, heliocentric.

reproduction, sexual, asexual, germination, pollination, seed formation, seed dispersal, pollen, stamen, stigma, plantlets, runners, mammal, amphibian,

Spring - forces

Newtons, streamline, cog

Summer - properties and changes of materials and animals including humans

foetus, Embryo, Womb, Gestation, Puberty, Hormone, Physical, Emotional,

precipitation, absorbent, electrical/thermal conductivity, solution, insoluble, solute, solvent, particle, mixture, filtering, sieving, residue, reversible/non reversible changes,

Year: 6

Term: Autumn

Topic : Darwin's Delights

<p>Science NC program of study</p>	<p>Evolution and Inheritance (BIOLOGY)</p> <p>Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.</p> <p>Pupils might work scientifically by: observing and raising questions about local animals and how they are adapted to their environment; comparing how some living things are adapted to survive in extreme conditions, for example, cactuses, penguins and camels. They might analyse the advantages and disadvantages of specific adaptations, such as being on 2 feet rather than 4, having a long or a short beak, having gills or lungs, tendrils on climbing plants, brightly coloured and scented flowers.</p>	<p>Living things and their habitats (BIOLOGY)</p> <p>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 Give reasons for classifying plants and animals based on specific characteristics.</p> <p>Pupils might find out about the significance of the work of scientists such as Carl Linnaeus, a pioneer of classification. Pupils might work scientifically by: using classification systems and keys to identify some animals and plants in the immediate environment. They could research unfamiliar animals and plants from a broad range of other habitats and decide where they belong in the classification system.</p>
<p>topic link</p>	<p>Work of Darwin and evolution, genetics and adaptation.</p>	<p>Darwin's expedition to Galapagos and discovered species.</p>

Year: 6

Term: Spring

Topic : Does the Heart Ever Stop?

<p>Science NC program of study</p>	<p>Animals, including Humans (BIOLOGY)</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>Light (PHYSICS)</p> <p>Recognise that light appears to travel in straight lines Use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye</p>
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	<p>Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function</p> <p>Describe the ways in which nutrients and water are transported within animals, including humans.</p> <p>Pupils might work scientifically by: exploring the work of scientists and scientific research about the relationship between diet, exercise, drugs, lifestyle and health.</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>Pupils might work scientifically by: deciding where to place rear-view mirrors on cars; designing and making a periscope and using the idea that light appears to travel in straight lines to explain how it works. They might investigate the relationship between light sources, objects and shadows by using shadow puppets. They could extend their experience of light by looking a range of phenomena including rainbows, colours on soap bubbles, objects looking bent in water, and coloured filters (they do not need to explain why these phenomena occur).</p>
topic link	<p>How fear, anxiety effects heart rate. Lie-detectors and effect on heart.</p> <p>Black History inventor – famous inventors who have faced punishment e.g. Rhazes (865-925), Alan Turing, Galileo and Albert Einstein</p>	Festivals that use light

Year: 6

Term: Summer

Topic : Is it ever right to fight?

Science NC program of study	<p>Electricity (PHYSICS)</p> <p>Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit</p> <p>Compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches</p> <p>Use recognised symbols when representing a simple circuit in a diagram.</p> <p>Pupils might work scientifically by: systematically identifying the effect of changing one component at a time in a circuit; designing and</p>	<p>SRE</p> <p>Objectives from PSHE map:</p> <p>Describe how a baby develops from conception through the nine months of pregnancy, and how it is born.</p> <p>Recognise how I feel when I reflect on becoming a teenager and how I feel about the development and birth of a baby.</p> <p>Science Project/challenge</p> <p>Pupils might work scientifically by:</p> <p>Planning different types of scientific enquires to answer questions, including recognising and controlling variables where necessary</p>
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	<p>making a set of traffic lights, a burglar alarm or some other useful circuit.</p>	<p>Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate</p> <p>Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs</p> <p>Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations</p> <p>Using test results to make predictions to set up further comparative and fair tests</p>
<p>topic link</p>	<p>Make an air-raid siren</p>	<p>Specific to class and interests. Could be linked to Year 6 performance or residential. Could investigate inventors – Tim Berners-Lee (www), Steve Jobs (apple), Grace Hopper (computer programming), Philip Emeagwali (fastest computer).</p>

Enrichment Map Science 2020-21

Classroom **investigation boxes** to be rotated on a half termly basis

Year group	Autumn term	Spring term	Summer term
Year 1	<p>Magnificent Me Black History Month – inventors STEM day (8th Nov) – Science, Computing, DT, Maths Investigation box –</p>	<p>Ship Ahoy! STEM day (7th March) – Science, Computing, DT, Maths Earth Hour – 27th March</p>	<p>Food Glorious Food! STEM day (23rd June) – Science, Computing, DT, Maths</p>
Year 2	<p>Fire and Ice Polar Explorer workshop – sc Black History Month – inventors STEM day (8th Nov) – Science, Computing, DT, Maths London Fire Brigade – Science, DT (TBC)</p>	<p>Heroes of the World STEM day (7th March) – Science, Computing, DT, Maths Earth Hour – 27th March</p>	<p>Location Location Visit to Wetlands Centre – Science (TBC) STEM day (23rd June) – Science, Computing, DT, Maths</p>
Year 3	<p>Earth Rocks! Black History Month – inventors STEM day (8th Nov) – Science, Computing, DT, Maths</p>	<p>Marvellous inventions STEM day(7th March) – Science, Computing, DT, Maths Visit to Science Museum – Science (TBC) Earth Hour – 27th March</p>	<p>The Romans Rule! STEM day (23rd June) – Science, Computing, DT, Maths</p>
Year 4	<p>Buckle up! Life’s a Journey Black History Month – inventors STEM day (8th Nov) – Science, Computing, DT, Maths</p>	<p>Blue Abyss STEM day (7th March) – Science, Computing, DT, Maths Earth Hour – 27th March Visit to Science Museum: Wonderlab – Science (TBC)</p>	<p>Sands of Time STEM day (23rd June) – Science, Computing, DT, Maths Visit to Science Museum: Digestion workshop – Science (TBC if unable to go in Spring)</p>
Year 5	<p>Laudable London Black History Month – inventors STEM day (8th Nov) – Science, Computing, DT, Maths Visit Greenwich Meridian – Science, Geography, History (TBC)</p>	<p>Champions of Change STEM day (7th March) – Science, Computing, DT, Maths Earth Hour – 27th March</p>	<p>Extreme Survivors STEM day (23rd June) – Science, Computing, DT, Maths Science Museum – Science</p>

Year 6	Let's party - Hola Mexico! Black History Month – inventors STEM day (8 th Nov) – Science , Computing, DT, Maths	Darwin's Delights 12 th Feb – Darwin day STEM day (7 th March) – Science , Computing, DT, Maths Visit to Science Museum Evolution – Science (TBC) Earth Hour – 27 th March	Traders and Raiders STEM day (23 rd June) – Science , Computing, DT, Maths
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Chicks?

Key Dates for Science:

2020

21st – 27th September: **Recycle Week**

4th – 10th October: **World Space Week**

12th- 18th October: **Fire Safety Week**

10th November: **World Science Day**

28th – 6th November: **National Tree Week**

2021

9th January: **National Static Electricity Day**

12th February: **Darwin Day**

March: **Women's History Month**

7th-11th March: **British Science Week**

18th March: **Global Recycling Day**

22nd March: **World Water Day**

27th March: **Earth Hour** (20:30 – 21:30)

6th – 15th March: **STE M Week (TBC)**

12th April: **Space Day**

22nd April: **Earth Day**

18th May: **International Museum Day**

8th June: **World Oceans Day**

5th June: **World Environment Day**

23rd June: **International Women in Engineering Day (TBC)**

30th June: **Asteroid Day**

July: **Plastic Free July**