Guilden Sutton Church of England Primary School

Love and Justice for All

Science Whole School Curriculum Progression Map

Our Christian Values: **WISDOM, JUSTICE, COMPASSION, LOVE, FORGIVENESS, FRIENDSHIP**

Year Group	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Reception	• Naming parts of the body and participating in P.E. sessions to run, jump, balance and move with increased control. • Moulding clay to create diva lamps and hedgehogs. • Explore 'air' through inflating and deflating balloons. • Discuss seasonal changes and go on an Autumn walk to find leaves, conkers, fir cones and acorns.		• Explore floating and sinking through making boats from different materials for the boy and the penguin to return to the Antarctic. • Learn all about penguins and identify different types. Describe the climate in which they live in the Antarctic. • Observe the hatching of chicks from eggs first hand. • Identify spring bulbs and produce direct observational drawings.		• Share non-fiction texts to learn about Lifecycles and animals. Encourage the children to explain the stages of development using correct terminology and new vocabulary; metamorphosis, amphibians, mammals etc. • Observe the butterfly lifecycle first hand and comment on what they see at each stage. • Plant sunflower seeds and make observations. What do they need to grow?	
	<u>Key Vocabulary</u> **Seasonal changes – s**pring, summer, autumn, winter, seasons, sunny, cloudy, hot, warm, cold, shower, raining, storm, thunder, lightning, hail, sleet, snow, icy, frost, puddles, windy, rainbow, animals, young, plants, flowers					
1	**Everyday Materials** ***Line of scientific enquiry examples:*** ***Fair testing:*** *Can I find out which material is the most absorbent?*	**Seasonal Changes** ***Line of scientific enquiry examples:*** ***Identifying and classifying****: Can I talk about different seasons*	**Plants** ***Line of scientific enquiry examples:*** ***Fair testing:*** *Can I find out where seeds grow best?* ***Identifying and classifying:*** *Can I identify, describe and compare two trees in our playground?*		**Animals including Humans** ***Line of scientific enquiry examples:*** ***Fair testing:*** *Can I investigate whether our sense of taste is better when we cannot see?*	

	***Identifying and classifying**: Can I classify objects into their material groups?* ***Research**: Can I share a fact about Greta Thunberg?* • Distinguish between an object and the material from which it is made. • Identify and name a variety of everyday materials, including wood, plastic, glass, 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 physical properties	*matching them to suitable clothing?* ***Observation over time**: Can I observe how the weather changes over a week?* ***Pattern seeking**: Can I say how day length changes over a year?* ***Research:** How is winter different around the world?* • Observe changes across the four seasons • Observe and describe weather associated with the seasons and how day length varies **George James Symons – a British meteorologist** **COP∞ – Climate Change** **EYFS - Explore the changes in seasons – outdoor learning**	***Observation over time:** Can I observe changes in leaves across the seasons?* ***Pattern seeking:** Is there a pattern in where we find moss growing in the school grounds?* ***Research:** Can I find out why Jean Baret was important to botany?* • Identify and name a variety of common plants, including garden plants, wild plants and trees, and those classified as deciduous and evergreen • Identify and describe the basic structure of a variety of common plants including roots, stem/trunk, leaves and flowers **Jeanne Baret – explorer and botanist who discovered new plants** **EYFS- Observing Spring bulbs and completing observational drawings.**	***Identifying and classifying:** Can I identify the features of a bird?* *Can I classify animals into carnivores, herbivores and omnivores?* ***Pattern seeking:** Are 5 year olds better at smelling things than 6 year olds?* ***Research:** Can I find out the characteristics of an animal and say what they need to stay healthy?* • Identify and name a variety of common animals that are birds, fish, amphibians, reptiles 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 (birds, fish, amphibians, reptiles and mammals, and including pets). • Identify, name draw and label the basic parts of the human body and say which parts of the body is associated with each sense **George Mottershead – the founder of Chester Zoo (Zoologist)** **EYFS – Lifecycles of animals, observing the chicks hatch, butterflies through the Hungry Caterpillar**

	COP∞ – recycling and landfill/ Greta Thunberg – environmental activist **EYFS - Properties of materials - floating and sinking**			
	Working Scientifically	• Ask simple questions and recognise that they can be answered in different ways • Observe closely, using simple equipment • Performing simple tests • Identifying and classifying • Using observations and ideas to suggest answers to questions • Gather and record data to help in answer questions		
	<u>Key Vocabulary</u> **Materials –** object, material, hard, soft, stretchy, shiny, dull, rough, smooth, bendy, not bendy, waterproof, not waterproof, absorbent, not absorbent, transparent, opaque **Seasonal changes –** weather, sunny, rainy, raining, shower, windy, snowy, cloudy, hot, warm, cold, storm, thunder, lightning, hail, sleet, snow, icy, frost, puddles, rainbow, seasons, winter, summer, spring, autumn, sunrise, sunset, day length **Plants –** deciduous, evergreen, root, stem, leaves, flowers, petals, fruit, seed, bulb, blossom, petal, berry, root, trunk, branch, stem, bark, stalk, bud, names of trees in the local area, names of garden and wild flowering plants in the local area, plants we call weeds **Animals including Humans** – amphibians, birds, fish, mammals, reptiles, carnivore, herbivore, omnivore, head, body, eyes, ears, nose, mouth, tongue, teeth, skin, fingers, leg, tail, wing, claw, fin, scales, feathers, fur, beak, paws, hooves, parts of the human body including those within the school's RSE policy, senses, touch, see, smell, taste, hear		
2	**Uses of everyday materials** ***Line of scientific enquiry examples:*** ***Fair testing:*** *Can I find out which material would be most suitable for Paddington's umbrella?* ***Identifying and classifying:*** *Can I identify a material from a riddle about its properties?* ***Pattern seeking:*** *Can I investigate how different materials can change because of their properties?*	**Animals including Humans** ***Line of scientific enquiry examples:*** ***Fair testing:*** *Can I find out if children are faster than adults at chosen activities?* ***Identify and classify:*** *Can I say which offspring belong to which animal?*	**Living things in their Habitats** **Rainforest focus** ***Line of scientific enquiry examples:*** ***Identifying and classifying:*** *Can I classify items as living, dead or never lived?* ***Pattern seeking:*** *Can I find out which microhabitats different minibeasts prefer?*	

	Research: *Can I find out about Charles Macintosh inventing waterproof materials?* • Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses • Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. **COP∞ - Recycling** **Scientist - Charles Macintosh – Inventor of waterproof materials** **Year 1 – Everyday materials**	***Observation over time:*** *Can I say how humans change over time?* ***Pattern seeking:*** *Can I find out the effect of different exercise on my body?* ***Research:*** *Can I find out what I need to do to be hygienic and why?* • 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. • Caterpillars to butterflies – investigation and information leaflet **Scientist - Maria Sibylla Merian – First naturalist to have studied insects** **Year 1 – Animals, including humans**	***Research:*** *Can I research the plants and animals found in a chosen habitat?* • 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 • 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 **Scientist – David Attenborough- British naturalist and advocator for COP∞** **COP∞ - Deforestation** **Climate change** **Impact of plastic within habitats** Visit to Chester Zoo to learn how animals and plants are suited to different habitats. **EYFS – showing concern for living things and the environment.**
	Plants (ongoing across three terms) ***Line of scientific enquiry examples:***		

<table>
<tr><td></td><td colspan="5">
Fair testing: What conditions to plants need to grow healthily?
Identify and classify: Can I identify the different parts of a seed?
Observation over time: Can I describe what happens to a planted bulb through the seasons?
Research: Can I find out about Jane Colden and her contributions to botany?

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

Scientist – Jane Colden - First female botanist

Year 1 – Plants
<table>
<tr><td>Working Scientifically</td><td>

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

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<tr><td colspan="2">
<u>Key Vocabulary</u>

Uses of everyday materials – materials, suitability, properties, John McAdam, John Dunlop, Charles Macintosh, macadamisation opaque, transparent, translucent, reflective, non-reflective, flexible, rigid, shape, push/pushing, pull/pulling, twist/twisting, squash/squashing, bend/bending, stretch/stretching
Plants – germination, sprout, shoot, seed dispersal, sunlight, water, temperature, nutrition, light, shade, warm, cool, water, space, grow, healthy, bulb, germinate, shoot, seedling
Animals including Humans – adult, develop, life cycle, offspring, reproduce, young, live young, dehydrate, diet, disease, energy, exercise, germs, heart rate, hygiene, nutrition, pulse, growth, baby, toddler, child, teenager, adult, old person, names of animals and their babies (e.g. chick/chicken, kitten/cat, caterpillar/butterfly), survive, survival, water, food, air, breathing, food types (e.g. meat, fish, vegetables, bread, rice, pasta, dairy)
Living Things and Their Habitats – life processes, living, dead, never living, food chain, food sources, habitat, microhabitat, depend, survive suited, suitable, shelter, names of local habitats (e.g. pond, woodland etc.), names of micro-habitats (e.g. under logs, in bushes etc.), conditions, light, dark, shady, damp, names of living things in the habitats and micro-habitats studied
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<tr><td>3</td><td>Light

Line of scientific enquiry examples:

Fair testing: Can I investigate how the position of the sun</td><td>Rocks

Line of scientific enquiry examples:

Fair testing: Can I find out whether some rock</td><td>Forces and Magnets

Line of scientific enquiry examples:

Fair testing: Can I find out which surface allows a toy car to travel furthest?</td><td>Animals Including Humans

Line of scientific enquiry examples:

Fair testing: Can I find out whether people</td><td>Plants

Line of scientific enquiry examples:

Fair testing: How does the length of a celery stick affect how long</td></tr>
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	affects the length of a shadow? ***Identify and classify:*** *Can I identify natural and artificial sources of light?* *Can I use a Venn diagram to sort opaque, transparent and translucent materials?* ***Observation over time:*** *Can I track the sun across the sky during the day?* ***Pattern seeking:*** *Can I find out how a shadow changes throughout the day?* ***Research:*** *Can I use a biography to find out about Thomas Edison's contribution to modern lights?* *Can I create a poster about sun safety?* • Recognise that they need light in	*types are more permeable than others?* ***Identifying and classifying:*** *Can I identify and describe different rock types?* ***Observation over time:*** *Can I show how soil layers build up over time?* ***Research:*** *Can I find out why Mary Anning's discovery was so important?* • 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	*Can I find out whether a magnet's force is strong enough to attract a paperclip through different materials?* ***Identifying and classifying:*** *Can I identify magnetic materials?* ***Pattern seeking:*** *Can I find patterns in how magnets work?* ***Research:*** *Can I use a website to find out how Michael Faraday's discoveries improved inventions in the home?* • 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 • Describe magnets as having two poles • Predict whether two magnets will attract or repel each other, depending on which poles are facing. • 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 **Michael Faraday-English scientist (magnetism and electricity)**	*with longer leg bones run faster?* ***Identifying and classifying:*** *Can I classify food into their correct groups?* ***Observation over time:*** *Can I describe the effects of exercise on our bodies?* ***Pattern seeking:*** *Can I find out whether people with longer leg bones run faster?* ***Research:*** *Can I identify food as very healthy, healthy or unhealthy based on its nutritional value?* • 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	*it takes for the food colouring to dye the leaves?* ***Observation over time:*** *Can I order and explain the lifecycle of a flowering plant?* ***Pattern seeking:*** *Can I observe which plants prefer shady conditions to grow?* ***Research:*** *Can I find out the role of each part of a flowering plant?* • Identify and describe the functions of different parts of plants; roots, stem, leaves and flowers • Explore the requirements of plants for life and growth and how they vary from plant to plant • Investigate the ways in which water is transported within plants

	order to see things and that dark is the absence of light • Notice that light is reflected from surfaces • Recognise that light from the sun can be dangerous and that there are ways to protect their eyes • Recognise that shadows are formed when the light from a light source is blocked by a solid object • Find patterns in the way that the sizes of shadows change **Thomas Edison- American inventor and scientist (electric light, telephony, telegraphy)** **Y1 – Seasonal changes**	**Mary Anning-English fossil hunter (Jurassic fossil finds including the first plesiosaur)** Helsby Hill Trip: identifying sedimentary rocks **Y2 -Materials** **Y1 - Animals Including Humans**		• Identify that humans and some animals have skeletons and muscles for support, protection and movement **Gerty T Cori (American biochemist-first woman to be awarded Nobel Prize in medicine)** World Museum Trip Opportunity to consolidate rock types and see dinosaur fossils. **All previous Year groups**	• Explore the role of flowers in the life cycle of flowering plants (pollination, seed formation and seed dispersal) **Charles Darwin (discoveries of plants and diagrams/sketches of new species)** **COP∞ - Climate change** **Y2 - Plants**
	Working Scientifically	• Plan different types of scientific enquires, to answer questions, including recognising and controlling variables where necessary • Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate			

		• Record data and results of increasing complexity using scientific diagrams and labels, clarification keys, tables, scatter graph, bar and line graphs • Use test results to make predictions to set up further comparative and fair tests • Report and present findings from enquires, including conclusions, casual relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations • Identify scientific evidence that has been used to support or prove false ideas or arguments			
	<u>Key Vocabulary</u> **Light and Shadow –** light, light source, dark, reflection, reflect, reflective, ray, pupil, retina, shadow, opaque, translucent, transparent, absence of light, surface, sunlight, dangerous, ultra violet **Rocks Fossils and Soils –** rock, stone, pebble, boulder, grain, crystals, layers, hard, soft, texture, absorbs water, fossil, bone, flesh, minerals, marble, chalk, granite, sandstone, slate, types of soil (e.g. peaty, sandy, chalky, clay), igneous, sedimentary, metamorphic, magma, lava, sediment, permeable, impermeable, fossilisation, palaeontology, erosion **Forces and Magnets - f**orce, friction, surface, push, pull, twist, contact force, non-contact force, magnetic field, magnet, strength, bar magnet, ring magnet, button magnet, horseshoe magnet, attract, repel, magnetic material, metal, iron, steel, poles, north pole, south pole **Plants –** photosynthesis, pollen, insect/wind pollination, male, female, seed formation, seed dispersal (e.g. wind dispersal, animal dispersal, water dispersal), air, nutrients, minerals, soil, absorb, transport **Animals including Humans** – nutrition, nutrients, carbohydrates, sugars, protein, vitamins, minerals, fibre, fat, water, skeleton, bones, muscles, joints, support, protect, move, skull, ribs, spine, tendon, vertebrate, invertebrate, healthy, energy, saturated fats, unsaturated fats			
4	**Electricity** ***Line of scientific enquiry examples:*** ***Fair testing:*** *Can I find out which metal is the best conductor of electricity?* ***Identifying and classifying:*** *Can I group electrical devices based on where the electricity comes from?* ***Observation over time:*** *How long does a*	**Sound** ***Line of scientific enquiry examples:*** ***Fair testing:*** *Can I find out whether a larger sized drum will make a louder sound than a smaller sized drum?* ***Identifying and classifying:*** *Can I identify what is vibrating to make a sound?* ***Pattern seeking:*** *Can I find patterns in the pitch*	**Living Things and their Habitats** ***Line of scientific enquiry examples:*** ***Identifying and classifying:*** *Can I group living things using a Venn diagram?* ***Observation over time:*** *Can I state how changes to the environment have affected endangered species?* ***Pattern seeking:*** *Can I identify invertebrates by*	**Animals Including Humans:** **Teeth and Digestion** ***Line of scientific enquiry examples:*** ***Fair testing:*** *Can I find out which liquid has the greatest effect on an eggshell?* ***Identifying and classifying:*** *Can I identify different types of teeth and state their function?*	**States of Matter** ***Line of scientific enquiry examples:*** ***Fair testing:*** *Can I investigate whether gas has any weight?* ***Identifying and classifying:*** *Can I sort different materials and objects into solids, liquids and gases?* ***Observation over time:*** *How does the level of water in a glass change when left on the windowsill?* ***Pattern seeking:*** *Can I find out how evaporation rates change as you add more salt to water?*

	battery light a torch for? ***Pattern seeking:*** *Can I find out which room has the most electrical sockets in a house?* ***Research:*** *Can I research and find key facts about Nikola Tesla's inventions?* • Where do we get electricity from? • Dangers of electricity • Research project about **Nikola Tesla** • How do you make a complete circuit? • Comparing conductors and insulators • Making our own switches to add to a circuit **COP∞ – Renewable energy** **EYFS – Understanding the world**	*of a sound from glasses of water?* ***Research:*** *Can I find out who invented microphones?* • Identify how sounds are made. • What changes to make the sound louder and quieter? • Workings of the inner ear • Changing the pitch of sound • Making our own musical instruments **James West and Gerhard M. Sessler (microphone used in modern phones)** **EYFS – Understanding the world**	*observing their similarities and differences?* ***Research:*** *Can I understand the importance of conservationists like Gerard Durrell?* • Explain what makes things living • Grouping living things into different categories • Differences and similarities between vertebrates and invertebrates • Write a fact file about an invertebrate • Complete a bug hunt around the school grounds • How do environmental changes affect living creatures? **Gerard Durrell (Unique plants and animals)** **Nilange Jayasinghe (Manager on the Wildlife Conservation team at WWF)**	***Observation over time:*** *Can I observe what happens to an egg left in cola?* ***Pattern seeking:*** *Do all carnivores have the same teeth?* ***Research:*** *Can I find out about the invention of modern toothpaste?* • Identify the different types of teeth and their function • Compare human and animal teeth • Describe the functions of the digestive system • Understand what a food chain is **Washington Sheffield (Toothpaste)** **Y3 - Animals including humans**	• What are different states of matter? • Properties of water – investigation, melting • Understanding boiling and the evaporation process **The Water Cycle** • Stages of the water cycle • Links to geography learning **Lord Kelvin (Temperature of absolute zero)** Chester trip. Incorporates visiting the River Dee to discuss the water's journey as part of the water cycle. **Y1 and Y2 - Materials**

			COP∞ – Environmental changes to habitat Xplore in Wrexham. Workshop to demonstrate digestion. Practical activities with the human skeleton. Information about different food groups. **Year 2 - Living Things and Their Habitats**		
	Working Scientifically	• Ask relevant questions and use different types of scientific enquiries to answer them • Set up simple practical enquiries, comparative and fair tests • Make up systematic and careful observations and, where appropriate, take accurate measurements using standard units, using a range of equipment, including thermometers and data loggers • Gather, record, classify and present data in a variety of ways to help in answering questions • Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables • Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions • Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions • Identify differences, similarities or changes related to simple scientific ideas and processes • Use straightforward scientific evidence to answer questions or to support their findings			
	<u>Key Vocabulary</u> **Electricity –** electricity, electrical appliance/device, mains, plug, electrical circuit, symbol, generate, renewable, non-renewable, electrons **Sound –** sound wave, source, vibrate, vibration, travel, pitch (high, low), volume, amplitude, faint, quiet, loud, insulation, particles, distance, soundproof, absorb sound, vacuum, ear drum **Living Things in their Habitats –** classification, classification keys, environment, habitat, human impact, positive, negative, migrate, hibernate herbivore, carnivore, omnivore, producer, predator, prey **Animals Including Humans (Teeth and Digestion) –** digestive system, digestion, mouth, teeth, saliva, oesophagus, salivary gland, liver, gall bladder, duodenum, stomach, small intestine, large intestine, rectum, anus, incisor, canine, molar, premolar, herbivore, carnivore, omnivore, producer, predator, prey **Materials (States of Matter and The Water Cycle)** – solid, liquid, gas, water vapour, heating, cooling, state change, melting, freezing, melting point, boiling, boiling point, evaporation, condensation, temperature, water cycle, precipitation				

5	**Properties and Changes of Materials** ***Line of scientific enquiry examples:*** ***Fair testing:*** *Can I find out whether a cool bag keeps a hot potato hot compared with a hot potato left on a plate?* ***Identifying and classifying****: Can I group changes based on whether they are reversible or irreversible?* ***Pattern seeking:*** *Can I find out how the temperature of water affects how quickly something dissolves?* ***Research:*** *Can I find out which materials are recyclable?* • Compare and group together everyday materials on the basis of their properties, including their hardness,	**Forces** ***Line of scientific enquiry examples:*** ***Fair testing:*** *Can I find out how the type of material used affects how quickly a parachute falls to the ground?* ***Identifying and classifying:*** *Can I label and name all the forces acting on the objects in each of these situations?* ***Pattern seeking:*** *Do all objects travel through water in the same way?* ***Research:*** *Can I find out why Sir Isaac Newton was an important scientist?* • Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object	**Earth & Space** ***Line of scientific enquiry examples:*** ***Observation over time:*** *Can I explain the phases of the moon over a lunar month?* ***Pattern seeking:*** *Can I investigate night and day length in different parts of the earth?* ***Research:*** *Can I name and describe features of the planets in our solar system?* *Can I find out why Caroline Herschel and Galileo are important to our understanding of earth and space today?* • Describe the movement of the Earth, and other planets, relative to the Sun in the solar system • Identify and describe features of the planets in our solar system • Describe the movement of the Moon relative to the Earth, explaining the different phases of the Moon • 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 **Galileo and Caroline Herschel – Planets orbiting the Sun and first woman to discover a comet.** **EYFS and Y1 – Seasons and weather patterns** **Y3 – forces and magnets**	**Living Things and their Habitats** ***Line of scientific enquiry examples:*** ***Identifying and classifying:*** *Can I identify the parts of a plant and say which are male and female?* ***Pattern seeking:*** *Is there are relationship between number of petals and number of Stamens?* ***Research:*** *Can I analyse and compare the life cycles of plants, mammals, amphibians, insects and birds?* • 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	**Animals Including Humans (Life Processes)** ***Line of scientific enquiry examples:*** ***Identifying and classifying:*** *Can I describe all the stages of human development?* ***Observation over time:*** *Can I identify the changes that take place in old age?* ***Pattern seeking:*** *Is there a relationship between a mammal's size and its gestation period?* ***Research:*** *Can I find out how Jane Goodall made links between chimpanzees and humans?* • Describe the changes as humans develop throughout their life • Describe the changes as humans

	solubility, transparency, conductivity (electrical and thermal), and response to magnets • Understand that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution • Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating • Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic • Demonstrate that dissolving, mixing and changes of	• 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 **Isaac Newton – Gravity** **Year 3 - Forces and Magnets**		**Gregor Mendel – Genetics** **Year 4 - Living Things and Their Habitats**	develop to old age in the context of the development of babies in their first year • Report findings in the context of the gestation period for animals • Explain reproduction, fertilisation and seed dispersal **Jane Goodall – study of chimpanzees and their behaviours** **All previous Year groups** **COP∞ – Protecting animal habitats**

	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 **Joseph Priestley – Chemist (discovery of oxygen)** **Biographies & explanations** **COP∞ – Recycling** **Y1 and Y2 - Materials** **Y4 – States of Matter**				
	Working Scientifically	• Plan different types of scientific enquires, to answer questions, including recognising and controlling variables where necessary • Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate • Record data and results of increasing complexity using scientific diagrams and labels, clarification keys, tables, scatter graph, bar and line graphs • Use test results to make predictions to set up further comparative and fair tests • Report and present findings from enquires, including conclusions, casual relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations • Identify scientific evidence that has been used to support or prove false ideas or arguments			
	Key Vocabulary **Materials (States of Matter)** – thermal insulator/conductor, change of state, mixture, dissolve, solution, soluble, insoluble, filter, sieve, reversible/non-reversible change, burning, rusting, new material, transparency, condensing, evaporating, freezing, melting **Forces –** force, gravity, Earth's gravitational pull, weight, mass, air resistance, water resistance, friction, buoyancy, streamlined, mechanisms, simple machines, levers, pulleys, gears				

	Earth and Space – Sun, Moon, Earth, planets (Mercury, Jupiter, Saturn, Venus, Mars, Uranus, Neptune), sphere, satellite, spherical bodies, Solar System, rotate, star, orbit, axis, geocentric model, heliocentric model, astronomer **Living Things in their Habitats –** life cycle, reproduce, sexual, sperm, fertilises, egg, live young, metamorphosis, asexual, plantlets, runners, cuttings **Animals Including Humans –** puberty, fertilisation, prenatal, gestation, asexual reproduction, sexual reproduction, adolescence, puberty, menstruation, adulthood, life expectancy, the vocabulary to describe sexual characteristics in line with the school's RSE policy				
6	**Animals including Humans** ***Line of scientific enquiry examples:*** ***Fair testing:*** *Can I investigate whether running or jogging has the greatest effect on our heart rate?* ***Identifying and classifying:*** *Can I identify the parts of the circulatory system?* ***Observation over time:*** *Can I keep a note of how much exercise I do in a week?* ***Pattern seeking:*** *Can I observe whether a narrow blood vessel restricts blood flow?* ***Research:*** *Can I research the amount of sugar in cereals?*	**Living Things and their Habitats** ***Line of scientific enquiry examples:*** ***Fair testing:*** *Can I find out how light/temperature affects how quickly mould grows?* ***Identifying and classifying:*** *Can I use a classification key to identify animals?* ***Observation over time:*** *Can I find out what happens to raspberries if left on the windowsill for two weeks?* ***Pattern seeking:*** *Can I find out where most invertebrates are found in our school grounds?* ***Research:*** *Can I research the different functions of microorganisms?* • Classify into three broad groups • Understand the eight levels of classification and at each level the number of living things in a group gets smaller group • Explain what a taxonomist is • Classify further into vertebrates and invertebrates and identify characteristics Use classification keys to identify animals and plants in their immediate environments. **Micro organisms**	**Evolution and Inheritance** ***Line of scientific enquiry examples:*** ***Fair testing:*** *Can I investigate which beak size and shape is best for catching ground insects?* ***Identifying and classifying:*** *Can I identify different types of fossil formation?* ***Observation over time:*** *Can I recognise how animals and plants have adapted to their environment?* ***Pattern seeking:*** *Can I see a pattern in the variation of moth that survives?* ***Research:*** *Can I research into the importance Charles Darwin's findings?*	**Light** ***Line of scientific enquiry examples:*** ***Fair testing:*** *Can I investigate how shadows can be elongated or shortened?* *Can I investigate whether light always travels in straight lines?* ***Identifying and classifying:*** *Can I group materials and objects according to how well they reflect light?* ***Pattern seeking:*** *Can I find out whether shadows always take the same shape as the objects causing them?* ***Research:*** *Can I find out how Humphrey Davy made miners' lamps safe?*	**Electricity** ***Line of scientific enquiry examples:*** ***Fair testing:*** *Can I investigate how the number of the cells in a circuit affects the brightness of the lamp/volume of a buzzer?* ***Identifying and classifying:*** *Can I group circuit components into those that are essential and those that are not?* ***Observation over time:*** *Can I describe how the brightness of a bulb changes as the battery runs out?* ***Pattern seeking:*** *How does brightness of bulb/volume of a buzzer change as more components are added to a circuit?*

	• Identify and name the main features of the human circulatory system • describe the function of the heart, blood vessels and blood • Understand how the exchange of gases occurs in the alveoli in the lungs • Understand how nutrients and water are absorbed into the small intestine • Be able to explain the positive impact of regular exercise on the human body • Understand that drugs, alcohol and tobacco have negative effects on the body. **William Harvey – circulation of blood/Galen – arteries carry blood Marie Maynard-Daly – pioneering research into blood and cholesterol**	• Understand that microorganisms are made up of viruses, bacteria, moulds and yeast; and that sometimes dust mite and phytoplankton are also microorganisms • Understand that they cannot be seen with the naked eye and live in the air, in and on our bodies, on objects around us and in water • List the helpful and harmful microbes **Carl Linnaeus – taxonomy/ naming organisms** **Year 4 - Living Things and their Habitats**	• Explain that evolution is a gradual process and where different kinds of living organisms have developed from earlier forms of millions of years • Understand that fossils are remains that help scientists with identification • Explain that animals and plants produce offspring which is similar but not identical to them • Explain that there is variation between parents and their offspring and within a species as well • Understand that adaptive traits are characteristics that are influenced by the environment such as climate and food; and that inherited traits are from parents • Explain what is a good habitat and list the different environments around the world	*Can I find out what contributions Patricia Bath made to eye health?* • Understand what light is, the way it travels in straight lines and how we use it to be able to see objects • Explain the law of reflection and the angle of incidence and refraction • Explain how shadows are formed and how they can be elongated and or shortened • Be able to explain the vocabulary related to the topic of light **Humphry Davy – invented the miner's safety lamp** **Patricia Bath – cataract surgery** **Year 3 -Light**	***Research:** Can I find out how major discoveries affected our understanding and use of electricity?* • Understand the workings of a series circuit and what happens when the circuit is broken • Explain why the brightness of a bulb becomes dimmer if more batteries are added • Be able to recognise and draw the components of a circuit • Understand what will make a bulb brighter/dimmer and a buzzer louder/quieter • Be able to explain the key vocabulary related to electricity **Michael Faraday – produce an electric current** **Year 4 - Electricity**

	Animals including Humans - all previous years		• Explain how living things adapt to their environment **Charles Darwin – theory of natural selection** **Rosemary Grant – evolutionary biologist** **Y2 Y3 and Y5: reproduction and lifecycles** **Y1 and Y3 fossils**		
	Working Scientifically	• Plan different kinds of fair experiments • Recognise why controlling variables is important and explain how to do this • Take accurate measurements using scientific equipment • Take repeated measurements when appropriate • Draw conclusions from results and describe causal relationships in these • Present findings in a written report with an introduction, conclusion and results • Present findings in an oral presentation • Identify scientific evidence that has been used to support or refute ideas or arguments **Record data using:** • Labelled scientific diagrams • Classification keys • Tables • Bar charts			
	Key Vocabulary **Living Things in their Habitats –** characteristics, classify, taxonomist, key, vertebrates, fish, amphibians, reptiles, birds, mammals, warm-blooded, cold-blooded, invertebrates, insects, spiders, snails, worms, flowering, non-flowering, mosses, ferns, conifers, **Animals Including Humans –** heart, pulse, rate, pumps, blood, blood vessels, transported, lungs, oxygen, carbon dioxide, cycle, circulatory system, diet, drugs, lifestyle, pulmonary, alveoli, gas exchange, villi, nutrients, kidneys, liver, drug, alcohol **Microorganisms –** bacteria, microorganism, microscope, microbes, species, penicillium, antibiotics, fungi, mould, virus, bacterium **Evolution and Inheritance -** offspring, sexual reproduction, variations, characteristics, adapted, adaptation, adaptive traits, inherited traits, inheritance, species, evolve, evolution, environment, habitat, natural selection, fossil, preserved				

	Electricity –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, generate, renewable, non-renewable, circuit diagram, circuit symbol, voltage, current, amps, cell, resistance, electrons, series circuit **Light -** straight lines, light rays, light source, reflection, incident ray, reflected ray, the law of reflection, refraction, visible spectrum, prism