**Year 1 Science**

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| Topic to be covered: Animals Including Humans |
| Vocabulary:  Question, questioning, observe, record, identify, group, classify, sort.  Mammals, amphibians, fish, reptiles, birds, carnivores, herbivores, omnivores, structure, head, limbs, body, torso, neck, elbow, knees, ankle, animals, |
| People:  Working in role as a zoologist. Person of interest Joan Beauchamp Procter . |
| Places:  School Grounds |
| Events:  RSPB Bird Watch |
| Knowledge:   * Identify and name a variety of common animals including fish. Can children sort animals into mammals, amphibians, fish, reptiles and birds? Can children identify the features of these different groups? What makes each group special? * Identify and name a variety of common animals that are carnivores, herbivores and omnivores. Can children identify what is special about each group? Can they identify animals that belong to each group? * Describe and compare the structure of a variety of common animals -fish, amphibians, reptiles, birds and mammals, including pets. Children to be able to label features that they observe. Children to be able to discuss the differences and similarities that they observe. * Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense. Children to identify the head, limbs, torso, neck, elbow, knees and ankles. Children to be able to compare their heights and the length of limps like the arms. Children to create simple pictographs/ graphs with this data. |
| Skills:   * Asking simple questions * Identify and classifying * Using Observations and ideas to suggest answers to questions. * Gathering and recording data to help in answering questions. |

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| Topic to be covered: Seasonal Change |
| Vocabulary:  Question, questioning, observe, record, identify, group, classify, sort, predict, diagram, chart, bar chart, table, data.  Autumn, Winter, Spring, Summer, weather, wind, sleet, rain, snow, hail, fog, cold, hot, warm, sunny, cloudy, daytime, day, night time. |
| People:  Working in role as a meteorologist |
| Places:  School grounds |
| Events:  Summer and Winter Solstice. Autumn and Spring Equinoxes. |
| Knowledge:   * Observe changes across the four seasons. * Observe and describe weather associated with the seasons and how the day length varies.   Children to go on regular walks looking at key plans and areas around school and observing the changes over the seasons. Children to create weather reports, build rain collectors and weather vanes to monitor the weather. |
| Skills:   * Asking simple questions * Observing using simple equipment. * Performing simple tests * Identify and classifying * Using Observations and ideas to suggest answers to questions. * Gathering and recording data to help in answering questions. |

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| Topic to be covered: Plants |
| Vocabulary:  Question, questioning, observe, record, identify, group, classify, sort, diagram, table.  Plant, tree, deciduous, evergreen, flower, leaf, leaves, stem, petal, seed, bulb, environment |
| People:  Working in role as a botanist |
| Places:  School grounds |
| Events: |
| Knowledge:   * Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees. Children to go on a nature walk and observe/record the plants in the school environment. Children to learn to identify plants and trees (from their leaves). Children to grow a plant from a seed and plant – ensure it is a plant well suited to the environment and teach the children where it should be planted and how it should be cared for. * Identify and describe the basic structure of a variety of common flowering plants, including trees. Children to compare plants/trees-what are their common features? What is different? Children to sort a variety of plants/trees. Children to label the basic structure of a plant and tree. Children to create an Attenborough style clip explaining the parts of a plant/tree. |
| Skills:   * Asking simple questions * Observing using simple equipment. * Identify and classifying * Using Observations and ideas to suggest answers to questions. |

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| Topic to be covered: Everyday Materials |
| Vocabulary:  Question, questioning, observe, record, identify, group, classify, sort, predict, chart, bar chart, table, data.  Materials, object, wood, glass, metal, water, physical properties, rock, plastic. |
| People:  Working in role as a physics |
| Places: |
| Events: |
| Knowledge:   * Distinguish between an object and the material from which it is made. Children to sort materials into groups and to refine their sorting abilities throughout the unit. Children to look at the same object made out of a variety of materials. * Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock. Children to be able to label the materials that make up an object. * Describe the simple physical properties of a variety of everyday materials. Investigation – which material is best? E.g. shopping bag – based on their materials. * Compare and group together a variety of everyday materials on the basis of their simple physical properties. Children to sort materials into groups and to refine their sorting abilities throughout the unit. Investigation – which material is best? E.g. shopping bag – based on their materials. |
| Skills:   * Asking simple questions * Observing using simple equipment. * Performing simple tests * Identify and classifying * Using Observations and ideas to suggest answers to questions. |

Year 2 Science

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| Topic to be covered: Animals Including Humans |
| Vocabulary:  Question, questioning, observe, record, identify, group, classify, sort, predict, diagram  Animals, humans, offspring, adults, young, born, needs, survival, environment, exercise, food, hygiene. |
| People:  Working in role as a biologist. Person of interest Maria Sibylla Merian (Entomologist) |
| Places:  School grounds |
| Events: |
| Knowledge:   * Notice that animals, including humans, have offspring which grow into adults. Can children match the offspring to the adult animal? Can children observe changes that have occurred when comparing animals when young to when they are an adult? Can children sort animals based on how they are born e.g. from an egg? * Find out about and describe the basic needs of animals, including humans, for survival (water, food and air). Link to survival expedition- what would we take with us? What could we find around us? Use different locations. Where do animals get what they need in the local environment of the school? How can we help animals that are struggling to survive such as bees and birds in winter? * Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene. Link to P.E to explore the benefits of exercise. Introduce the different food groups and the benefits of each in the correct measure. |
| Skills:   * Asking simple questions and recognising that they can be answered in different ways. * Observing closely, using simple equipment. * Identify can classifying * Using Observations and ideas to suggest answers to questions. |

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| Topic to be covered: Uses of Everyday Materials |
| Vocabulary:  Question, questioning, observe, record, identify, group, classify, sort, predict, diagram, chart, bar chart, table, data.  Materials, purpose, properties, solid, suitability |
| People:  Working in role as a physicist. Person of interest Spencer Silver |
| Places:  Winnington Works |
| Events:  Polythene Invention at Winnington Works |
| 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. Link to DT children to build products fit for purpose. Children to evaluate the properties of different materials and suggest what they would be best suited for. * Find out how the shapes of solid objects made from some materials can be changes by squashing, bending, twisting and stretching. Link to fit for purpose when exploring properties. |
| Skills:   * Asking simple questions and recognising that they can be answered in different ways. * Observing closely, using simple equipment. * Performing simple tests * Identify can classifying * Using Observations and ideas to suggest answers to questions. * Gathering and recording data to help in answering questions. |

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| Topic to be covered: Plants |
| Vocabulary:  Question, questioning, observe, record, identify, predict, diagram, chart, bar chart, table, data.  Bulbs, seeds, mature, temperature, roots, light, water |
| People:  Working in role as a botanist. Person of interest Agnes Arber |
| Places:  School Garden |
| Events: |
| Knowledge:   * Observe and describe how seeds and bulbs grow into mature plants. Children to grow a variety of plants from both bulbs and seeds – children to create gardeners guides to taking care of them. Link to pollination project and planting in Andrew’s garden. Children to learn about the advantages of growing in a greenhouse. Possible extension – children to investigate the ph levels of the soil around school to decide where plants would be best suited. * Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy. Children to investigate what plants need to survive. Children to plan an investigation that tests what plants need to survive. |
| Skills:   * Asking simple questions and recognising that they can be answered in different ways. * Observing closely, using simple equipment. * Performing simple tests * Identify can classifying * Using Observations and ideas to suggest answers to questions. * Gathering and recording data to help in answering questions. |

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| Topic to be covered: Living Things and their Habitats |
| Vocabulary:  Question, questioning, observe, record, identify, group, classify, sort, predict, diagram, table, data.  Living, habitats, food source, food chain, suited, depend, micro-habitat. |
| People:  Working in role as a biologist. Person of interest Jane Goodall (Ethologist and Anthropologist) |
| Places:  School grounds. |
| Events: |
| Knowledge:   * Explore and compare the differences between things that are living, dead, and things that have never been alive. Children to sort using Venn diagrams and explain their choices. Children to identify the features of the three groups and how we identify something as living/dead or never 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. Children to go on a habitats walk –what lives in our school environment? Why? How are they suited to the environment? How does it help them to survive? Children to look at habitats such as hedgerows and how we can help to support the animals that are losing this sort of habitat in our own gardens. Children to look at the hedgehog and build hedgehog houses or the bumble bee and how we can make our environment more friendly for pollinating insect and why this is important. * Identify and name a variety of plants and animals in their habitats, including micro-habitats. Children to go on a nature walk to find micro-habitats. Children to create their own micro-habitat (mini-beast hotel) and create a guide book for it. * Describe how animals obtain their food from plants and other animals, using micro-habitats. * 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. Children to look at their local environment and the animals we know make it their home. What food sources do these animals have? Children to create simple food chains. Look at how energy moves up the food chain. What would happen if part of the food chain was removed? For example if the plants were to be killed? What would happen to the rest of the food chain. |
| Skills:   * Asking simple questions and recognising that they can be answered in different ways. * Observing closely, using simple equipment. * Identify can classifying * Using Observations and ideas to suggest answers to questions. |

Year 3 Science

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| Topic to be covered: Rocks |
| Vocabulary:  Relevant questions, prediction, plan, observations, record, research, enquiry, comparative, fair, measurements, classify, diagrams, charts, tables, conclusion, explanation.  Appearance, physical, properties, hard, soft, shiny, dull, rough, smooth, absorbent, fossils, sedimentary, rock, soil, organic, metamorphic, grains, crystals, igneous, sand, shell, pebbles, sediment. |
| People:  Working in role as a geologist and palaeontologist. People of interest Mary Anning, Florence Bascom and Katia Krafft. |
| Places:  Lyme Regis for fossils. Yellow Stone Park –Active Volcano. |
| Events:  Eyjafjallajokull Iceland 2010. |
| Knowledge:   * Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties. Children to sort using Venn and Carroll diagrams based on their own and set criteria. Children to explore properties such as permeability. Children to identify why different rocks are used for different purposes –why are they best suited to this job? * Describe in simple terms how fossils are formed when things that have lived are trapped within rock. Children to look at a range of fossils. Children to create their own fossils. * Recognise that soils are made from rocks and organic matter. Children to observe different soils and make comparisons. Children to identify different types of soil. |
| Skills:   * Asking relevant questions. * Set up simple practical enquires and comparative tests. * Making systematic and careful observations and take accurate measurements. * Gathering, recording, classifying and presenting data in a variety of ways. * Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables * Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions * Using results to draw simple conclusions.   Identifying differences, similarities or changes related to simple scientific ideas and processes |

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| Topic to be covered: Light |
| Vocabulary:  Relevant questions, prediction, plan, observations, record, research, enquiry, fair, accurate, measurements, diagrams, tables, conclusion, explanation.  Light, see, dark, reflect, surface, natural, star, Sun, Moon, blocked, solid, artificial, torch, candle, lamp, sunlight, shadow, protect eyes. |
| People:  Working in role as a physicist. People of interest Johann Ritter and Albert Einstein. |
| Places:  Norway for the Northern Lights |
| Events:  Northern Lights (Aurora) |
| Knowledge:   * Recognise that they need light in order to see things and that dark is the absence of light. Children to explore different light sources. * Notice that light is reflected from surfaces. Children to reflect light from different surfaces. Can they identify reflective and non-reflective surfaces? Can they create a reflective scale from most to least? * Recognise that light from the sun can be dangerous and that there are ways to protect their eyes. Children to create a campaign to keep their eyes safe. Could also link to the dangers of laser pens. * Recognise that shadows are formed when the light from a light source is blocked by a solid object. Children to explore shadows. What is the biggest/ smallest shadow they can make from their bodies. Shadow puppet theatre. * Find patterns in the way that the sizes of shadows change. Children to investigate the impact of shadows in relation to the distance from a light source. |
| Skills:   * Asking relevant questions. * Set up simple practical enquires and comparative tests. * Making systematic and careful observations and take accurate measurements. * Gathering, recording, classifying and presenting data in a variety of ways. * Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables * Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions * Using results to draw simple conclusions. * Identifying differences, similarities or changes related to simple scientific ideas and processes |

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| Topic to be covered: Forces and magnets |
| Vocabulary:  Relevant questions, prediction, plan, observations, record, research, enquiry, comparative, fair, measurements, classify, keys, diagrams, conclusion, explanation.  Force, push, pull, open, surface, magnet, magnetic, attract, repel, magnetic poles, North, South. |
| People:  Working in role as a physicist. Person of Interest Magnes the Greek Shepherd. |
| Places:  Magnetic Poles |
| Events: |
| Knowledge:   * Compare how things move on different surfaces. Children to identify whether an object moving is due to a push or a pull. * 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. Children to sort using Venn Diagrams before they test materials and then refine after testing using magnets. * Describe magnets as having two poles. Children to explore how a compass works. Children to create a simple compass. * Predict whether two magnets will attract or repel each other, depending on which poles are facing. Children to explore the effects of magnets on a range of materials, including other magnets. |
| Skills:   * Asking relevant questions. * Set up simple practical enquires and comparative tests. * Making systematic and careful observations and take accurate measurements. * Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables * Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions * Using results to draw simple conclusions. * Identifying differences, similarities or changes related to simple scientific ideas and processes |

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| Topic to be covered: Plants |
| Vocabulary:  Relevant questions, prediction, plan, observations, record, research, enquiry, comparative, fair, accurate, measurements, thermometer, data logger, classify, diagrams, charts, tables, conclusion, explanation.  Plant, leaf, root, leaves, bud, flowers, blossom, petals, stem, fruit, vegetables. |
| People:  Working in role as a botanist. Person of interest Mary Agnes Chase. |
| Places:  Kew Gardens, London |
| Events: |
| Knowledge:   * Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers. Children to ‘dissect’ a plant and identify the parts of a plant and their role. Children to create an information leaflet/ video about the functions of different parts of a plant. Recap the purpose of scientific diagrams as opposed to pictures. * 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. Children to recap what they learnt in Year 2 about what plants need to survive. Children to use this knowledge to grow the healthiest plant over the half term – agree as a class on the criteria for healthiest. Children to review their progress and keep a diary of any changes they make to the plant/ environment and the outcome to its health. * Investigate the way in which water is transported within plants. Children to use food colouring in water with a flowering plant to observe how water is transported. * Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. Link to pollination project. Children to identify how flowering plants around school pollinate. Children to create a model that explains either pollination or seed dispersal e.g. dandelion seed |
| Skills:   * Asking relevant questions. * Set up simple practical enquires and comparative tests. * Making systematic and careful observations and take accurate measurements. * Gathering, recording, classifying and presenting data in a variety of ways. * Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables * Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions * Using results to draw simple conclusions. * Identifying differences, similarities or changes related to simple scientific ideas and processes |

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| Topic to be covered: Animals Including Humans |
| Vocabulary:  Relevant questions, prediction, plan, observations, record, research, enquiry, comparative, fair, accurate, measurements, classify, keys, diagrams, charts, tables, conclusion, explanation.  Nutrition, vitamins, minerals, fat, protein, carbohydrates, fibre, water, skeletons, support, protection, skull, brain, ribs, heart, lungs, movement, joint, muscles, pull, contract, relax, diet. |
| People:  Working in role as a biologist and dietician. People of interest Gerty Cori, Wilhem Rontgen. |
| Places:  Veterinary Surgery |
| Events: |
| Knowledge:   * Identify that animals, including humans, need the right types and amounts of nutrition, and that they cannot make their own food; they get nutrition from what they eat. Children to sort food –what food groups are they aware of/ can identify. Link to cooking on a budget topic. Children to investigate the nutritional values of different foods and use to inform menu creations. * Identify that humans and some other animals have skeletons and muscles for support, protection and movement. Children to explore and sort images of different x-rays. Children to compare the skeleton structures of different animals. Children to be able to write an explanation of why we need skeletons. |
| Skills:   * Asking relevant questions. * Set up simple practical enquires and comparative tests. * Making systematic and careful observations * Gathering, recording, classifying and presenting data in a variety of ways. * Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables * Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions * Using results to draw simple conclusions. |

Year 4 Science

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| Topic to be covered: Sound |
| Vocabulary:  Relevant questions, prediction, plan, observations, record, research, enquiry, comparative, fair, accurate, measurements, data logger, keys, diagrams, charts, tables, conclusion, explanation.  Sound, volume, vibration, pitch, source, medium, ear, faint, fainter, medium. |
| People:  Working in role as a physicist. People of interest Aristotle, Joseph Fourier |
| Places: |
| Events:  Invention of the telephone. |
| Knowledge:   * Identify how sounds are made, associating some of them with something vibrating. Link to music teaching. DT link to creating their own instrument. Children to explain how their instrument makes a sound through vibration. * Recognise that vibrations from sounds ravel through a medium to the ear. Investigate string telephones. * Find patterns between the pitch of a sound and features of the object that produced it. Link to music teaching about pitch. * 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. Investigate telephone phones. Investigate the distance sound can travel around the school. Use data loggers. |
| Skills:   * Asking relevant questions and using different types of scientific enquiries to answer them. * Set up simple practical enquires comparative and fair tests. * Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers. * Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions. * Recording findings using simple scientific language, drawings, labelled diagrams, bar charts. * Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions * Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions * Identifying differences, similarities or changes related to simple scientific ideas and processes * Using straightforward scientific evidence to answer questions or to support their findings |

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| Topic to be covered: Living Things and their Habitats |
| Vocabulary:  Relevant questions, prediction, plan, observations, record, research, enquiry, comparative, fair, accurate, measurements, thermometer, data logger, classify, keys, diagrams, charts, tables, conclusion, explanation.  Environment, flowering, plants, vertebrate, mammals, insects, amphibians, invertebrates, reptiles, birds, ecology. |
| People:  Working in role as a conservationist and biologist. Person of interest Rachel Carson. |
| Places:  Delamere Forest |
| Events: |
| Knowledge:   * Recognise that living things can be grouped in a variety of ways. Children to use Venn and Carroll diagrams to sort using their own criteria and given criteria. * Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment. Use keys for known wildlife. Children to create keys to be used in the school environment looking at habitats around school. Children to use keys to identify animals they may not have encountered before from habitats different to the local environment. * Recognise that environments can change and that this can sometimes pose dangers to living things. Children to look at the impact of wildlife and eco-systems when the countryside is developed (local link) and to areas of deforestation (world link) or pollution in the sea (world link). |
| Skills:   * Asking relevant questions and using different types of scientific enquiries to answer them. * Set up simple practical enquires comparative and fair tests. * Making systematic and careful observations * Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions. * Recording findings using simple scientific language, drawings, labelled diagrams * Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions * Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions * Identifying differences, similarities or changes related to simple scientific ideas and processes   Using straightforward scientific evidence to answer questions or to support their findings |

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| Topic to be covered: Animals Including Humans |
| Vocabulary:  Relevant questions, prediction, plan, observations, record, research, enquiry, comparative, fair, accurate, measurements, classify, diagrams, charts, tables, conclusion, explanation.  Digestive system, mouth, molars, incisors, canines, teeth, mixes, small intestine, large intestine, stomach, acid, enzymes, oesophagus. |
| People:  Working in role as a dentist and gastroenterologist |
| Places:  Dentists |
| Events: |
| Knowledge:   * Describe the simple functions of the basic parts of the digestive system in humans. Children to learn about the organs involved in digestion and what role they play. Children to create a working model of the digestive system to demonstrate how food passes through the body. * Identify the different types of teeth in humans and their simple functions. Children to be able to identify how many teeth a human has, why we have baby teeth, the different teeth we have and the jobs each tooth does. Children to create a guide to taking care of your teeth. Children to explain how the different teeth function and why we need them * Construct and interpret a variety of food chains, identifying producers, predators and prey. |
| Skills:   * Asking relevant questions and using different types of scientific enquiries to answer them. * Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers. * Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions. * Recording findings using simple scientific language, drawings, labelled diagrams. * Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions * Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions * Identifying differences, similarities or changes related to simple scientific ideas and processes * Using straightforward scientific evidence to answer questions or to support their findings |

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| Topic to be covered: States of Matter |
| Vocabulary:  Relevant questions, prediction, plan, observations, record, research, enquiry, comparative, fair, accurate, measurements, thermometer, classify, diagrams, charts, tables, conclusion, explanation.  Solid, freeze, melt, liquid, evaporate, condensate, condense, gas, changing state, heated, heat, cooled, degrees Celsius, water cycle, evaporation, temperature, water vapour. |
| People:  Working in role as a chemist and physicist. Person of interest Sir Humphry Davy. |
| Places: |
| Events: |
| Knowledge:   * Compare and group materials together, according to whether they are solids. Liquids or gases. Can children identify the different structures of states of matter? * Observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happened in degrees Celsius. Investigations such as melting/ evaporating to be conducted as part of this unit. * Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature. Children to create a model to explain the water cycle. This could be done as a cross curricular computing session |
| Skills:   * Asking relevant questions and using different types of scientific enquiries to answer them. * Set up simple practical enquires comparative and fair tests. * Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers. * Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions. * Recording findings using simple scientific language, drawings, labelled diagrams, bar charts, and tables * Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions * Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions * Identifying differences, similarities or changes related to simple scientific ideas and processes   Using straightforward scientific evidence to answer questions or to support their findings |

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| Topic to be covered: Electricity |
| Vocabulary:  Relevant questions, prediction, plan, observations, record, research, enquiry, comparative, fair, accurate, measurements, diagrams, conclusion, explanation.  Appliances, electricity, electrical circuit, cell, wire, bulb, buzzer, danger, sign, insulators, conductors, switch. |
| People:  Working in role as a physicist. People of interest Michael Faraday and Alessandro Volta |
| Places: |
| Events: |
| Knowledge:   * Identify common appliances that run on electricity. Children to sort and identify objects. * Construct simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers. Children given time to explore at the beginning of the unit to identify prior knowledge and understanding. * 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. * Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit. * Recognise some common conductors and insulators, and associate metals with being good conductors. |
| Skills:   * Asking relevant questions and using different types of scientific enquiries to answer them. * Set up simple practical enquires comparative and fair tests. * Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables * Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions * Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions * Identifying differences, similarities or changes related to simple scientific ideas and processes * Using straightforward scientific evidence to answer questions or to support their findings |

Year 5 Science

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| Topic to be covered: Earth and Space |
| Vocabulary:  Prediction, plan, observations, record, repeat, identify, fair, scientific diagrams, present, interpret, conclusion, explanation, relationships, evidence, refute, degree of trust in results.  Earth, sphetircal, Sun, Moon, rotation, planets, day, night |
| People:  Working in role as an astronomer. People of interest Tim Peaks, Neil Armstrong, Annie Easley, Wang Zhemy, Katherine Johnsonn, Jocelyn Bell Brunell, Cecilla Payne-Caposchkin |
| Places:  Jodrell Bank |
| Events:  The moon landing |
| 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:   * Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary taking measurements, using a range of scientific equipment, with increasing accuracy and, taking repeat readings when appropriate * Recording data and results of increasing complexity using scientific diagrams and labels, bar and line graphs. * 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. |

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| Topic to be covered: Light |
| Vocabulary:  Prediction, plan, variables, observations, record, repeat, identify, fair, accurate, precise, quantitative measurements, scientific diagrams, present, systematic, graphs (scatter, line, bar), patterns, interpret, conclusion, explanation, relationships, evidence, refute, degree of trust in results, validity.  Light, filters, travels, reflect, light source, straight, mirrors, object, shadows, spectrum. |
| People:  Working in role as a physicist. Person of interest Patricia Bath (ophthalmologist) |
| Places:  Opticians. |
| Events: |
| Knowledge:   * Recognise that light appears to travel in straight lines. Children to create a light maze or periscope applying their knowledge of how light travels to make it work. * 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. Look at how cars use mirrors and how Hermione avoided being killed in the Chamber of secrets using a mirror. Children to utilise a mirror to i.e. ‘see’ around a corner or behind them (spy glasses). * 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 * Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them. Children could explore Indonesian shadow puppets – ensure they can explain the science behind the shadows not just tell a story. |
| Skills:  Skills:   * Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary taking measurements, using a range of scientific equipment, with increasing accuracy and, taking repeat readings when appropriate * Recording data and results of increasing complexity using scientific diagrams and labels, classification, tables, bar and line graphs. * Using test results to make predictions to set up further comparative and fair tests. * Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations. |

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| Topic to be covered: Properties and Changes of Materials |
| Vocabulary:  Prediction, plan, variables, observations, record, repeat, identify, fair, accurate, precise, quantitative measurements, present, systematic, graphs (scatter, line, bar), patterns, interpret, conclusion, explanation, relationships, evidence, degree of trust in results, validity.  Properties, transparent, hardness, conductor, solubility, magnetic, solution, separate, irreversible, states of matter, dissolve, reversible. |
| People:  Working in role as a chemist and physicist. Person of interest Marie Curie |
| Places:  Cheshire Salt Works |
| Events: |
| 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. Children to sort different materials and then to re-sort and refine their choices after testing. * Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution. Children to investigate using sugar/ salt to create a solution and them evaporate the water to get salt/sugar crystals. * Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating. * Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic demonstrate that dissolving, mixing and changes of state are reversible changes. Children to create a materials guide based on their properties and what they would be best suited for. * 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. Children to look at a burning candle melting chocolate –how are these two changes different? Children to look at the effect of bicarbonate of soda and vinegar. How can we identify it as a chemical change? |
| Skills:  Skills:   * Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary taking measurements, using a range of scientific equipment, with increasing accuracy and, taking repeat readings when appropriate * Recording data and results of increasing complexity using scientific diagrams and labels, classification, tables, bar and line graphs. * Using test results to make predictions to set up further comparative and fair tests.   Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations. |

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| Topic to be covered: Living Things and their Habitats |
| Vocabulary:  Prediction, plan, observations, record, scientific diagrams, classification keys, present, conclusion, explanation, relationships, evidence.  Lify cycles, reproduction, animal naturalists/ behaviourist, reproduction, sexual, asexual. |
| People:  Working in role as a biologist. Person of interest David Attenborough |
| Places: |
| Events: |
| Knowledge:   * Describe the differences in the life cycle of a mammal, an amphibian, an insect and a bird. * Describe the life process of reproduction in some plants and animals.   Children to identify plants/ animals in the local environment –and further afield and research their life cycle –this could be done as a group project with a presentation at the end of the unit. |
| Skills:  Skills:   * Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary taking measurements, using a range of scientific equipment, with increasing accuracy and, taking repeat readings when appropriate * Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, bar and line graphs. * Using test results to make predictions to set up further comparative and fair tests. * Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations. |

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| Topic to be covered: Animals Including Humans |
| Vocabulary:  Prediction, plan, variables, observations, scientific diagrams, classification keys, present, explanation, relationships, evidence.  Human, development, baby, toddler, child, teenager, adult, puberty, gestation, length, mass, grows, grow, growing. |
| People:  Working in role as a biologist. Person of interest Rosalind Franklin |
| Places:  Retirement homes, maternity units. |
| Events: |
| Knowledge:  **Animals Including Humans:**   * Describe the changes as humans develop to old age.   (To be taught as part of Sex Education). Literacy/PSHE links to the story of the Flour Babies. To look at how a human changes/ develops from a foetus to old age. |
| Skills:  Skills:   * Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary taking measurements, using a range of scientific equipment, with increasing accuracy and, taking repeat readings when appropriate * Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, bar and line graphs. * Using test results to make predictions to set up further comparative and fair tests. * Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations. |

Year 6 Science

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| Topic to be covered: Living Things and their habitats |
| Vocabulary:  Prediction, plan, variables, observations, record, accurate, scientific diagrams, classification keys, present, patterns, interpret, conclusion, explanation, relationships, evidence.  Micro-organism, classifying, characteristics. |
| People:  Working in role as a biologist. People of interest Elizabeth Blackwell, Esther Lederberg (micro-biologist), Carl Linnaeus |
| Places: |
| Events: |
| 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. Children to sort into Venn diagrams using their own and set headings. Children to create factsheets/ presentations about the different groups. Children to invest a living thing for someone to sort into a group. * Give reasons for classifying plants and animals based on specific characteristics. |
| Skills:   * Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate * Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs. * Using test results to make predictions to set up further comparative and fair tests. * Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations. * Identifying scientific evidence that has been used to support or refute ideas or arguments. |

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| Topic to be covered: Electricity |
| Vocabulary:  Prediction, plan, variables, observations, record, repeat, identify, fair, accurate, precise, quantitative measurements, scientific diagrams, interpret, conclusion, explanation, relationships, evidence, refute, degree of trust in results, validity.  Voltage, brightness, volume, switch, motor, circuit, safety, bulb, series circuit. |
| People:  Working in role as a physicist. People of interest Hertha Ayrton, Edith Clarke |
| Places:  Electric Mountain – Mynydd Gwefru |
| Events: |
| Knowledge:   * Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit. Investigate the effect of more/ less cells used in a circuit. * Compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches. Children to create a range of circuits and explain how changing variables affects outputs. * Use recognised symbols when representing a simple circuit in a diagram. Children to create diagrams from circuits and circuits from diagrams. |
| Skills:   * Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate * Using test results to make predictions to set up further comparative and fair tests. * Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations. * Identifying scientific evidence that has been used to support or refute ideas or arguments. |

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| Topic to be covered: Animals Including Humans |
| Vocabulary:  Prediction, plan, variables, observations, record, scientific diagrams, classification keys, present, systematic, graphs (scatter, line, bar), patterns, interpret, conclusion, explanation.  Circulatory system, heart, blood vessels, blood, exercise, diet, internal organs, nutrients, bacteria. |
| People:  Working in role as a cardiologist. People of interest Luois Pasteur, Alexander Fleming (microbiologist) |
| Places:  Hospital |
| Events:  Discover of penicillin and bacteria. |
| Knowledge:   * Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood. Children to create diagrams/models of the heart and explain how it works. Children to explain how we can take care of our hearts. * Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function. Children to create healthy living guides. Children to conduct research. Children to look at the link between different types of exercise and the effect they have on heart rate. Children to identify which exercise is most beneficial to different parts of our bodies. * Describe the ways in which nutrients and water are transported within animals, including humans. |
| Skills:   * Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate * Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs. * Using test results to make predictions to set up further comparative and fair tests. * Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations. * Identifying scientific evidence that has been used to support or refute ideas or arguments. |

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| Topic to be covered: Evolution and Inheritance |
| Vocabulary:  Prediction, plan, variables, observations, record, repeat, identify, fair, accurate, precise, , scientific diagrams, present, interpret, conclusion, explanation, relationships, evidence, refute, degree of trust in results, validity.  Fossils, characteristics, evolution, adapt, inherit, variation, offspring, change. |
| People:  Working in role as a geneticist. People of interest Charles Darwin, Nettie Stevens, Barbara MccLintock |
| Places:  Galapagos Islands |
| Events:  The voyage of the Beagle |
| Knowledge:   * Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago. Children to compare different fossils and draw conclusions from them. What can we learn from where fossils are found about how the Earth has changed? * Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents. Children to bring in family photos –what inherited features can you identify. Pose the question about whether they can inherit other traits such as creativity? Idea of nature vs nurture to debate. If they have siblings what inherited features do they share? What differs. Look at a basic explanation of how parents pass on their genes. * Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution. Look at the examples from the Galapagos islands as to how adaption led to evolution. That animals do not change to survive but that the strong survive and their genes are passed on. Look at animal breading for specific features such as race horses. Study the resurrection plant and how it has adapted to its environment to survive. Children to explain how a plant/ animal is well adapted to its environment |
| Skills:   * Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate * Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs. * Using test results to make predictions to set up further comparative and fair tests. * Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations. * Identifying scientific evidence that has been used to support or refute ideas or arguments. |

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| Topic to be covered: Forces |
| Vocabulary:  Prediction, plan, variables, observations, record, repeat, identify, fair, accurate, precise, quantitative measurements, scientific diagrams, present, systematic, graphs (scatter, line, bar), patterns, interpret, conclusion, explanation, relationships, evidence, refute, degree of trust in results, validity.  Gravity, air resistance, water resistance, friction, surface, force, effect, move, accelerate, decelerate, stop, change direction, mechanism, pulley, gear, spring, theory of gravitation. |
| People:  Working in role as a physicist. People of interest Isaac Newton, Galileo |
| Places:  Bexhill-on-Sea the birthplace of British motor racing. |
| Events:  Silverstone F1, soapbox races. |
| Knowledge:   * Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object. Ensure children understand that weight is not the factor that determines the rate in which an object forms –this can be demonstrated by dropping a basket ball and tennis ball from the same height and at the same time –they will both hit the ground at the same time. Children also need to understand that weight can vary based on location (Moon/ Earth) but your mass remains the same. * Identify the effects of air resistance, water resistance and friction that act between moving surfaces. Children to investigate parachutes/ streamline shapes. Taught through ‘Go Kart Unit’. * Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect. Taught through ‘Go Kart Unit’. |
| Skills:   * Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate * Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs. * Using test results to make predictions to set up further comparative and fair tests. * Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations. * Identifying scientific evidence that has been used to support or refute ideas or arguments. |