Aiskew, Leeming Bar
Church of England Primary School

'Rooted in love and growing together to become lifelong learners'

Science Key Learning

Our overall intent is that pupils when they leave Y6, that through awe and wonder, they have developed a natural curiosity about the world and beyond and how it works. They are aware of how their actions, and the actions of the wider population, affects the world in which they live. Our science curriculum is carefully structured to allow pupils to lay the foundations for understanding the world through the specific disciplines of biology, chemistry and physics whilst being confident when working scientifically to use the disciplinary knowledge around the what, when, where and why of working scientifically.

Science is a key subject where we promote Building Learning Power skills: children are constantly encouraged to question, make links, distil information, imagine, be resourceful, plan, revise, reflect, notice and reason. We want children to feel that they are able to question, investigate and reason through the exploration of concepts in science, this supports children making sense of who they are and how they fit in the world.

Our golden threads are: 'caretakers of the world'; 'being imaginative in order to make the world a better place'; and 'being curious and inquisitive about how everything links within the universe.

We teach our units using a cyclic curriculum. This grid shows how we build progression into our learning and provide further opportunities to build upon knowledge gained. KS1 pupils enter a 2 year rolling programme at different points and KS2 pupils enter the 4 year rolling programme at different points; it is important that children have the opportunity to revisit learning in order to help it become 'sticky knowledge', to further develop skills when using this knowledge and purposefully recap on learning. Not only does this ensure our curriculum fulfils the distinct needs of our learners, it also supports children in being able to remember more because revisiting learning helps it transfer to the long-term memory. In order to do this effectively, we use the Bloom's rainbow steps to success to ensure children can use knowledge in a variety of higher order ways appropriate to their stage of learning. For some science units of learning within KS2 it is necessary to teach lower Key Stage 2 separately from upper Key Stage 2. This way of working is successful for our mixed-aged classes.

The Characteristics of Effective Learning are the bedrock of children's experiences within EYFS in all areas of learning. They include:

Playing and exploring
- finding out and exploring
- using what they know in their play
- being willing to have a go

Active learning
- being involved and concentrating
- keeping on trying
- enjoying achieving what they set out to do

Creating and thinking critically
- having their own ideas
- using what they already know to learn new things
- choosing ways to do things and finding new ways

These characteristics form the first steps in preparing our youngest children in their learning about our Building Learning Power skills and link EYFS learning to that which follows in Key Stage 1 and Key Stage 2 where we continue to develop these skills further. The chart below shows how these link.

We believe that in order to help children to be effective learners and remember more, we use Bloom's Taxonomy throughout school as a way of effectively deepening children's understanding. Children are introduced to this in EYFS through the Characteristics of Effective Learning. This hierarchical structure links well with the Characteristics of Effective Learning and therefore links the EYFS curriculum to the curriculums taught in Key Stage 1 and 2. The table below shows how Bloom's Taxonomy links to these characteristics.

Characteristics of Effective Learning	Building Learning Power	Bloom's Taxonomy
Finding out and exploring	**This links to the Cognitive and Emotional Mind** Noticing: really sensing what's out there Questioning: playing with situations Imagining: using the mind's eye as a learning theatre Capitalising: making good use of resources Making links: seeking coherence, relevance and meaning	Remember: Can the student recall or remember the information?
Using what they know in their play	**This links to the Cognitive Mind** Making links: seeking coherence, relevance and meaning Capitalising: making good use of resources Reasoning: thinking rigorously and methodically	Remember: Can the student recall or remember the information? Understand: Can the student explain ideas or concepts? Apply: Can the student use the information in a new way?
Being willing to have a go	**This links to the Emotional Mind** Perseverance: stickability; tolerating the feeling of learning	
Being involved and concentrating	**This links to the Emotional and Social Mind** Absorption: flow; the pleasure of being rapt in learning Managing distractions: recognising and reducing interruptions Collaboration: the skills of learning with others	
Keeping on trying	**This links to the Emotional and Social Mind** Perseverance: stickability; tolerating the feeling of learning Interdependence: balancing self-reliance and sociability	
Enjoying achieving what they set out to do	**This links to the Strategic Mind** Planning: working learning out in advance Revising: monitoring and adapting along the way	Apply: Can the student use the information in a new way?
Having their own ideas	**This links to the Strategic Mind** Planning: working learning out in advance Revising: monitoring and adapting along the way	Apply: Can the student use the information in a new way? Create: Can the student create a new product or point of view?
Using what they already know to learn new things	**This links to the Strategic and Cognitive Mind** Distilling: drawing out the lessons from experience Capitalising: making good use of resources	Apply: Can the student use the information in a new way?
Choosing ways to do things and finding new ways	**This links to the Strategic and Cognitive Mind** Distilling: drawing out the lessons from experience Capitalising: making good use of resources Planning: working learning out in advance Revising: monitoring and adapting along the way	Analyse: Can the student distinguish between the different parts? Create: Can the student create a new product or point of view?

Reception Development Matters 2020	**Communication and Language** Learn new vocabulary. Use new vocabulary through the day. Ask questions to find out more and to check they understand what has been said to them. Articulate their ideas and thoughts in well-formed sentences. Connect one idea or action to another using a range of connectives. Describe events in some detail. Use talk to help work out problems and organise thinking and activities, and to explain how things work and why they might happen. **Understanding the World** Explore the natural world around them. Describe what they see, hear and feel whilst outside. Recognise some environments that are different to the one in which they live. Understand the effect of changing seasons on the natural world around them.
Early Learning Goals	**Communication and Language** **Listening, Attention and Understanding** Listen attentively and respond to what they hear with relevant questions, comments and actions when being read to and during whole class discussions and small group interactions. Make comments about what they have heard and ask questions to clarify their understanding. **Speaking** Participate in small group, class and one to one discussions, offering their own ideas, using recently introduced vocabulary. Offer explanations for why things might happen, making use of recently introduced vocabulary from stories, non-fiction, rhymes and poems when appropriate.

	Express their ideas and feelings about their experiences using full sentences, including use of past, present and future tenses and making use of conjunctions, with modelling and support from their teacher. **Understanding the World** **The Natural World** Explore the natural world around them, making observations and drawing pictures of animals and plants. Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class. Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.

Unit of Learning EYFS	How KS1 units revisit key learning	How Science will help in life.	Key substantive knowledge	Key disciplinary knowledge	Key learning opportunities with other curriculum areas
Animals including humans R	**Animals including humans Y1** **Animals including humans Y2**	That animals change as they grow Learn body parts Healthy lifestyle	I know that different animals have different body parts (some have no legs, some have lots) I know that different animals like different foods and live in difference places I know that some animals are big and some animals are small I know that butterflies do not start out looking like butterflies (undergo metamorphosis) I know how to talk about different places an animals might live I know that some animals hibernate I know that some animals are adapted to live under the sea and that humans are adapted to live on land I know that if I wash my hands then that will kill off germs I know about the importance of a healthy diet I know I cannot eat unhealthy foods like chips and pizza everyday and I need a variety of food I know about the importance of a healthy exercise regime I know that exercise is good for my body.	• **Studying Patterns** (R3) • **Discussing Similarities and Differences** (R3) • **People, Creatures and Plants** (R3) • **Discussing Similarities and Differences** (R4) • **Identifying and/or Classifying** (R4) • **People, Creatures and Plants** (R4) • **Discussing Similarities and Differences** (R5) • **Identifying and/or Classifying** (R5) • **People, Creatures and Plants** (R5) • **Examine and Describe Objects and Events** (R5) • **Examining Changes** (R13) • **Similarities and Differences** (R13) • **Asking questions** (R13) • **People, Creatures and Plants** (R13) • **Similarities and Differences** (R14) • **Asking questions** (R14) • **People, Creatures and Plants** (R14)	Managing Self
Seasonal changes R	**Seasonal changes Y1**	Appropriate clothing choices for the season Recognising seasonal change	I know how to identify that it is Autumn, Winter, Summer and Spring I know how to identify seasonal colours I know that lots of new life begins in the Springtime I know how to choose appropriate clothing for the seasons	• **Asking questions** (R1) • **Discussing Similarities and Differences** (R1) • **Examine and Describe Objects and Events** (R1) • **Working in a Team** (R1) • **Asking questions** (R2) • **Examine and Describe Objects and Events** (R2) • **Working in a Team** (R2) •	The Natural World Managing Self
Magnets R	**Everyday Materials Y2** **Everyday Materials Y1**	Properties of a magnet	I know that magnets are 'sticky' without being sticky. I know magnets stick to certain materials (metals) I know how to find an object which a magnet will stick to	• **Explaining Why It Works** (R11) • **Describing How It Works** (R11) • **Asking questions** (R11) • **Examine and Describe Objects** (R11) • **Studying Patterns** (R11) • **Explaining Why It Works** (R11) • **Asking questions** (R11)	The Natural World
Planes & Boats (Forces/powers)	**Everyday Materials Y2** **Everyday Materials Y1**	Floating and sinking	I know that changing conditions in an experiment can change the result. I know that a throw is a push. I know what materials float and sink	• **Studying Patterns** (R12) • **Explaining Why It Works** (R12) • **Asking questions** (R12)	The Natural World
Living things and their habitats R	**Living things & their habitats Y2**	Each living creature has its own home	I know about similarities and differences in relation to living things and their habitats I know how to talk about the features of my own immediate environment and how environments might vary from one another I know how to make observations of animals and plants and explain why some things occur and talk about changes.	• **Examining changes** (R16) • **Similarities and Differences** (R16) • **Asking Questions** (R16) • **People, Creatures and Plants** (R16) • **Asking Questions** (R17) • **People, Creatures and Plants** (R17) • **Studying Patterns** (R18) • **Similarities and Differences** (R18) • **Asking Questions** (R18) • **People, Creatures and Plants** (R18)	The Natural World People, Culture and Communities
Plants R	**Plants Y2**	How to grow plants	I know that plants need sun to grow I know that plants need water to grow	• **Asking questions** (R15) • **Studying Patterns** (R15)	The Natural World

	Plants Y1		I know that most plants need soil and nutrients to grow I know some plants grow from seeds	• **Discussing Similarities and Differences** (R15) • **People, Creatures and Plants** (R15) • **Working in a Team** (R15)	Outdoor – Growing Vegetables, Fruit and Flowers
Everyday Materials R	**Everyday Materials Y2** **Everyday Materials Y1**	Different material properties	I know that objects are made from different materials I know about similarities and differences in relation to places, objects, materials and living things I know how to about the features of my immediate environment and how environments might vary from one another I know how to make observations of animals and plants and explain why some things occur, and talk about changes	• **Making and Recording Observations**(R6) • **Identifying and/or Classifying** (R6) • **Trying to Explain** (R6) • **Examine and Describe Objects and Events** (R6) • **Examining Changes** (R7) • **Similarities and Differences** (R7) • **Asking questions** (R7) • **Examining Changes** (R8) • **Similarities and Differences** (R8) • **Asking questions** (R8) • **Similarities and Differences** (R9) • **Explaining Why It Works** (R9) • **Asking questions** (R9) • **Examine and Describe Objects** (R9) • **Similarities and Differences** (R10) • **Describing How It Works** (R10) • **Asking questions** (R10) • **Examine and Describe Objects** (R10)	The Natural World

Unit of Learning KS1	EYFS Units of Learning which form the basis of this learning	How KS1 units revisit key learning	How Science will help in life.	Key substantive knowledge	Key disciplinary knowledge	Key learning opportunities with other curriculum areas
Animals including humans Y1 1.8 Zoology 1.9 Animal Diets 1.11 The Human Body and Taste 1.12 Eyesight and Hearing 1.13 Touch and Smell	**Animals including humans R**	**Animals including humans Y2**	Understand how senses work Different diets and adaptations	I know how to describe and compare observable features of animals from a range of groups I know how to group animals according to what they eat I know how to identify and name a variety of common animals including fish, amphibians, reptiles, mammals and birds I know how to identify and name a variety of common animals that are carnivores, herbivores and omnivores I know how to name and locate parts of the human body, including those related to the senses I know how to describe and compare observable features of animals from a range of groups I know how to describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets) I know how to identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense I know how to take care of animals taken from their habitat and understand the need to return them safely to their homes I know how to use the vocabulary and identify: head, neck, arms, elbows, legs, knees, face, ears, eyes, hair, mouth and teeth. **<u>Scientists</u>** Jane Goodall, Charles Darwin, Alfred Russel Wallace, Alexander von Humboldt, Conrad Gesner David Attenborough, Steve Irwin, Rachel Carson, Desmond Morris, Nelly de Rooij Kikunae Ikeda, MacFarlan Smith, Nicolas Steno Vitruvius, Hermann von Helmholtz, Pythagoras, William Paley, DE Nilsson	**2 - I can observe changes and patterns -** animal spotting nature walk. 1.8 **3 - I can identify and classify -** to classify the animal as either a fish, mammal, bird, amphibian, reptile or invertebrate. 1.8 **5 - I can research using secondary sources -** to create a fact file. 1.8 **3 - I can identify and classify -** to classify the animal skull and teeth according to whether they are carnivores, omnivores or herbivores. 1.9 **5 - I can research using secondary sources -** to research the diet of an animal that is a carnivore, again for a herbivore and an omnivore. 1.9 **4 - I can conduct comparative and fair tests** – investigate 'does smell effect taste.' 1.11 **2 - I can observe changes and patterns –** look at similarities and difference in 'optical illusions.' 1.12 **4 - I can conduct comparative and fair tests** – investigate 'hearing test.' 1.12 **4 - I can conduct comparative and fair tests** – investigate 'mystery box.' 1.13 **4 - I can conduct comparative and fair tests** – investigate 'smell test.' 1.13	DT – Moving parts DT - Taste Vipers – Animals, Groups of animals

				Avicenna, Hippocrates, Crito, Tapputi, Rene le Florentin		
Everyday Materials Y2 2.6 Changing Materials 2.7 Material Strength 2.8 Ship Building 2.9 Materials in History	**Everyday Materials R** **Forces R (Powers)** **Magnets R (Powers)**	**Everyday Materials Y1**	Material properties for different projects i.e. best material choices for garden furniture.	I know how to distinguish objects from materials, describe their properties, identify and group everyday materials and compare their suitability for different uses I know how to identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses I know how to describe how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. **Scientists** Charles Marie de la Condamine, Joseph Priestley, Charles Goodyear, Leonard Mullins Benvenutto Cellini, Angelo Barovier, Georg Agricola Archimedes Alexander Parks, Leo Hendrik Baekeland, Thomas Hancock, Robert Banks	**3 - I can identify and classify –** to group objects according to their properties (changing materials). 2.6 4 - **I can conduct comparative and fair tests** – to test comparative materials (Air Drying Clay, Plasticine and Playdoh) 2.6 4 - **I can conduct comparative and fair tests** – to test the strength of paper and cardboard. 2.7 **2 - I can pattern seek -** Compare strengths of paper and cardboard when using more than one sheet. 2.7 **2 - I can pattern seek –** Notice patterns in materials even though it is the same object. 2.8 4 - **I can conduct comparative and fair tests** – egg & salt test. 2.8 **2 - I can pattern seek (notice differences/similarities) -** Compare strengths of paper and cardboard when using more than one sheet. 2.9 **5 - I can research using secondary sources -** to research great inventors who used the properties of a material in order to create something (George Macintosh/3M post its - Arthur Fry). 2.9	DT - across majority of projects, suitability for tasks Geography – Local area & Contrasting locality Vipers – Materials
Seasonal changes Y1 1.1 The Seasons 1.2 Day Length 1.3 Weather Around the World 1.7 Weather Review 1.16 Seasons Review	**Seasonal changes R**		Know the seasons and their characteristics. Understand weather and clothing choices.	I know how to identify that it is Autumn, Winter, Summer and Spring I know how to identify seasonal colours I know that lots of new life begins in the Springtime I know how to choose appropriate clothing for the seasons **Scientists** Anders Celsius, Lord Kelvin, Daniel Fahrenheit, Olaus Roemer Eratosthenes, Al-Jazari, Ibn-al-Shatir, Ambrogio Lorenzetti, Gian Carlo Rainieri, Su Song, Pope Sylvester II, John Harrison Aristotle, Theophrastus, Pomponius Mela, Al Dinawari, Christopher Wren, Gabriel Fahrenheit Benjamin Franklin	**1 – Observations over time –** Make a rain gauge, take readings each month. Take temperature readings each month. 1.1 **2 - I can pattern seek –** look for similarities and differences in seasonal birthday chart. 1.1 **1 – Observations over time –** Experiment why is it warmer in the daytime. 1.2 **2 - I can pattern seek –** look for similarities and differences. I.2 **4 - I can conduct comparative and fair tests** – to investigate and compare day lengths. 1.2 **5 - I can research using secondary sources -** to research day length around the world. 1.2 **5 - I can research using secondary sources -** to research weather around the UK. 1.3 **1 – Observations over time –** Chart readings from rain and temperature gauge. 1.16 **2 - I can pattern seek –** look for similarities and differences in seasonal weather. 1.16	Geography – UK, Weather, Climate Zones Vipers – Seasons Vipers – Weather Patterns
Plants Y2 2.10 Planting 2.14 Plant Growth	**Plants R**	**Plants Y1**	How to look after plants.	I know how to describe the basic needs of plants for survival and the impact of changing these and the main changes as seeds and bulbs grow into mature plants I know how to observe and describe how seeds and bulbs grow into mature plants I know how to find out and describe how plants need water, light and a suitable temperature to grow and stay healthy **Scientists** Charles Darwin, Katherine Esau, Agnes Arber, May Theilgaard Watts, Theophrastus	**1 – Observations over time** – Set up observation experiments to be monitored over time, Bulb & Seed, Cress & Pea changing environment. 2.10 **2 - I can pattern seek –** Notice patterns in results graphs, Bulb & Seed. 2.14 4 - **I can conduct comparative and fair tests** – investigate conditions of the Cress & Pea. 2.14	Outdoor – Gardening Vipers – Growing Plants
Everyday Materials Y1 1.4 An Introduction to Materials 1.5 Testing Materials	**Everyday Materials R** **Forces R (Powers)** **Magnets R (Powers)**	**Everyday Materials Y2**	Material properties for different projects ie best material choices for windows or to soak up a spillage.	I know how to distinguish objects from materials, describe their properties, identify and group everyday materials I know how to distinguish between an object and the material from which it is made	**3 - I can identify and classify -** to classify and group 'types of materials. ' 1.4 **2 - I can observe changes and patterns –** look at similarities and difference in the 'types of materials.' 1.4	DT - across majority of projects, suitability for tasks Vipers – Materials

1.6 Other Properties of Materials				I know how to identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock I know how to describe the simple physical properties of a variety of everyday materials I know how to compare and group together a variety of everyday materials on the basis of their simple physical properties **<u>Scientists</u>** Benvenuto Cellini, Johann Gutenberg, William Champion, Bryan Higgins, Richard E Tressler, Mohamed Atalla Angelo Barovier, Vannoccio Biringuccio, Galileo Galilei, Joseph Aspin, Charles Fritts, Charles Martin Hall Charles Marie de la Condamine, Joseph Priestley, Charles Goodyear, Leonard Mullins	**3 - I can identify and classify -** to classify and group 'transparency. ' 1.5 **2 - I can observe changes and patterns –** look at similarities and difference in 'absorbency.' 1.5 **4 - I can conduct comparative and fair tests** – investigate 'absorbency. '1.5 **2 - I can observe changes and patterns -** How stretchy 1.6 **3 - I can identify and classify -** to classify the materials by elasticity. 1.6 **4 - I can conduct comparative and fair tests** – investigate 'How stretchy. '1.6	
Animals including humans Y2 2.1 Animal Growth 2.2 Animal Survival 2.3 Food 2.4 Exercise 2.5 Hygiene	**Animals including humans R**	**Animals including humans Y1**	The cycle of life Healthy lifestyle – teeth, hygiene, food & exercise.	I know how to name and locate parts of the human body, including those related to the senses and describe them I know how to describe the basic needs of animals for survival and the main changes as offspring from young animals, including humans, grow into adults I know how to group animals according to what they eat, describe how animals get their food from other animals and/or plants, and use simple food chains to describe these relationships I know how to describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene I know how to describe the basic needs of animals, including humans, for survival (water, food and air) **<u>Scientists</u>** Hippocrates, Claudius Galen, Jean Fernel, Ibn-al-Nafis, William Harvey, Ida Hyde Hamayun Abdulali, Louis Agassiz, Emily Arnesen, Miriam Louisa Rothschild, Philip Sclater James Lind, Justus Liebig, Christiaan Eijkmann Mary Bagot Stack, Jerry Morris, Kiki Sandford Edward Jenner, Florence Nightingale, Louis Pasteur, Alexander Fleming, Joseph Lister	**2 - I can observe changes and patterns –** look at similarities and difference in 'age and height.' 2.1 **4 - I can conduct comparative and fair tests** – investigate 'age and height.' 2.1 **3 - I can identify and classify -** to identify, classify and group 'lifecycles. ' 2.1 **5 - I can research using secondary sources -** to research 'lifecycles. of insects ' 2.1 **1 – Observations over time** – Set up observation experiments to be monitored, Solar still. 2.2 **4 - I can conduct comparative and fair tests** – investigate 'Solar still. '2.2 **3 - I can identify and classify -** to group'Needs & Wants.' 2.2 **3 - I can identify and classify -** to identify, classify and group ''food. ' 2.3 **5 - I can research using secondary sources -** to research 'too much too little. Food the effects ' 2.3 **2 - I can observe changes and patterns –** look at changes- 'star jump challenge.' 2.4 **1 – Observations over time** – look at changes- 'star jump challenge.' 2.4 **4 - I can conduct comparative and fair tests** – investigate 'Star jump chllenge - comparitive. '2.4 **4 - I can conduct comparative and fair tests** – simple test investigate 'Spread of germs from skin, Washing hands to clean. '2.5	PSHE – Healthy Living/Healthy Eating PE – Striver, keeping healthy Vipers – My Body
Living things & their habitats Y2 2.11 Dead or Alive 2.12 Habitats and Adaption 2.13 Animal Food	**Living things and their habitats R**		How everything is interlinked The need for conservation	I know how to identify whether things are alive, dead or have never lived I know how to explore and compare the differences between things that are living, dead, and things that have never been alive I know how to name different plants and animals and describe how they are suited to different habitats I know how to 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 I know how to identify and name a variety of plants and animals in their habitats, including micro-habitats I know how to 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.	**3 - I can identify and classify -** to group/classify 'MRS Gren – dead or alive .' 2.11 **3 - I can identify and classify -** to group'different habitats.' 2.12 **4 - I can conduct comparative and fair tests** – simple test investigate 'Habitat survey. ' 2.12 **2 - I can observe changes and patterns –** look at changes- ''Habitat survey. ' 2.12 **2 - I can observe changes and patterns –** food chain 2.13 **3 - I can identify and classify -** to classify the materials by carnivore, herbivore & omnivore. 2.13	Golden Thread – Caretakers of the World Vipers – Houses, Animal Houses Vipers – Habitats Vipers – Animals, Food Chains Vipers - Adaptations

				<u>Scientists</u> Elie Metchnikoff, Herman Feifel, Song Ci, Ambroise Pare, Paolo Zacchia, Johann Peter Frank Theophrastus, Charles Darwin, Carl Linnaeus, Jean Baptiste Lamarck Gerald Durrell, Georges Cuvier, Elissa Sursara, Terri Irwin		
Plants Y1 1.10 Planting 1.14 Identifying Plants 1.15 Planting Review	**Plants R**	**Plants Y2**	Know the parts of a plant and its function	I know how to identify and name a variety of common wild and garden plants, including deciduous and evergreen trees I know how to identify and describe the basic structure of a variety of common flowering plants, including trees I know how to identify and name a variety of common wild and garden plants, including deciduous and evergreen trees. **<u>Scientists</u>** Katherine Esau, Carl Linnaeus, Theophrastus, Agnes Arber, Charles Darwin Mike Baillie, Ludwig Beissner, Maciej Giertych, William Douglas Cook	**2 - I can observe changes and patterns –** similarities in seeds and bulbs. 1.10 **3 - I can identify and classify -** to identify and classify – seeds & bulbs. 1.10 **1 – Observations over time** – planting – dark/light. 1.10 **4 - I can conduct comparative and fair tests** – investigate 'planting.' 1.10 **3 - I can identify and classify -** to identify and classify – nature walk leaf identification. 1.14 **3 - I can identify and classify -** to identify and classify – evergreen/deciduous 1.14 **2 - I can observe changes and patterns –** observations - 'similarities and differences, fruit & vegetables.' 2.4 **1 – Observations over time** – observations - 'outside/inside fruit & vegetables.' 2.4	Outdoor – Gardening PSHE – Healthy Eating Vipers – Garden & Plants

Unit of Learning KS2	EYFS/KS1 Units of Learning which form the basis of this learning	How KS2 units revisit key learning	How Science will help in life.	Key substantive knowledge	Key disciplinary knowledge	Key learning opportunities with other curriculum areas
Light Y6 6.6 How light travels	**Seasonal changes R** **Seasonal changes Y1**	Light Y3 Electricity Y6	How the length/position of shadows change during the day and mirrors the solid shape that casts it.	I know how to recognise that light appears to travel in straight lines I know how to 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 I know how to 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 I know how to use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them. **<u>Scientists</u>** Isaac Newton did in splitting white light with prisms. Leonardo da Vinci, James Clerk Maxwell, Edward Morley, Percy Shaw.	**2 - I can observe changes and patterns – 3** holes & a torch or Tube & candle. 6.6 **2 - I can observe changes and patterns** - Shadow shapes, pattern seeking. 6.6 **2 - I can observe changes and pattern** Ray diagrams & Periscopes 6.6 **3 - I can identify and classify – t**o identify luminous or non-luminous materials. 6.6	RE: An angel fell from heaven - 'Lucifer' means. Vipers Reading - light DT: Pupils will make a periscope in this lesson.
Rocks Y3 3.4 Introduction to Rocks	**Everyday Materials Y1** **Everyday Materials Y2**	Living things and habitats Y4 (teach Y3/4 together)	Knowledge about the formation of the Earth. A better understanding of geographical features/concepts – cliffs & erosion.	I know how to compare and group together different kinds of rocks on	**3 - I can identify and classify – t**o classify rocks. 3.4	Vipers Reading – rocks & soil Golden Thread - Caretaker of the world

3.5 Sedimentary and Metamorphic Rocks 3.6 Igneous Rocks and Minerals 3.7 Fossils 3.8 Soils		State of matter Y4 Properties and changes of materials (Everyday materials) Y5	Fossils show what life was like in the past, vegetation & animals. Where in the world fossils are found.	the basis of their appearance and simple physical properties I know how to describe in simple terms how fossils are formed when things that have lived are trapped within rock I know how to recognise that soils are made from rocks and organic matter. **Scientists** Charles Lyell, James Hutton, Alfred Wegener, Florence Bascom, Janet Vida Watson Vasily Dokuchaev, Francis Hole, Mary C Baltz	**5 - I can research using secondary sources -** to research sedimentary rocks. 3.5 **4 - I can conduct comparative and fair tests /2 - I can observe changes and patterns** – rock porosity investigation. 3.5 **5 - I can research using secondary sources -** to research metamorphic rocks. 3.5 **3 - I can identify and classify – t**o classify intrusive and extrusive igneous rocks. 3.6 **4 - I can conduct comparative and fair tests /2 - I can observe changes and patterns** – Moh's scale of hardness. 3.6 **4 - I can conduct comparative and fair tests /2 - I can observe changes and patterns** – Moh's scale of hardness. 3.8	
Evolution and inheritance Y6 6.9 Adaption 6.10 Inheritance 6.11 Evolution	Living things and their habitats Y2	Living things and habitats Y4 (teach Y3/4 together) Living things and habitats Y5 (whole class)	A better understanding of family similarities & differences - Genes.	I know how to recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago I know how to recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents I know how to identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution **Scientists** Charles Darwin, Alfred Russel Wallace, Jean Baptiste Lamarck, Empedocles, Barbara McClintock, Mary Leakey	**2 - I can observe changes and patterns** – sweets & liquorice. 6.9 **4 - I can conduct comparative and fair tests /2 - I can observe changes and patterns** – how do polar bears stay warm. 6.9 or Moths. 6.9 **2 - I can observe changes and patterns** – the children of Mr Men and Little Miss. 6.10 **2 - I can observe changes and patterns** – the inheritance game. 6.10 **4 - I can conduct comparative and fair tests /2 - I can observe changes and patterns** – Darwin's Mockingbirds. 6.11	Vipers Reading – evolution & Darwin's biomes Golden Thread - Caretakers of the world – animal adaptations.
Living things and habitats Y4 (teach Y3/4 together) 4.11 Classification 4.12 Extinction	Living things and their habitats Y2	Evolution and inheritance Y6 Living things and habitats Y6, 6.7 6.8	Looking after the environment	I know how to recognise that living things can be grouped in a variety of ways I know how to explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment I know how to recognise that environments can change and that this can sometimes pose dangers and have an impact on living things **Scientists** Theophrastus, Ulisse Aldrovandi, Robert Hooke, Terri Irwin, Maria Merian, Maria Bachman, Carl Woese.	**3 - I can identify and classify – t**o classify different animals, aliens or objects. 4.11 **3 - I can identify and classify –** the world through time? 4.12 **5 - I can research using secondary sources –** the structure of the Earth/plate tectonics. 4.12	Geography – continents Vipers Reading – biomes Golden Thread - Caretakers of the world (extinction)
Living things and habitats Y6 (teach Y5/6 together) 6.7 Micro-organisms 6.8 Classification	Living things and their habitats Y2	Living things and habitats Y4 (teach Y3/4 together) 4.11 4.12		I know how to describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals I know how to give reasons for classifying plants and animals based on specific characteristics. **Scientists**	**3 - I can identify and classify** **5 - I can research using secondary sources –** Microorganisms. 6.7 **1 – Observations over time** **2 - I can pattern seek** **4 - I can conduct comparative and fair tests** – Microbial Growth. 6.7 **3 - I can identify and classify**- Classification of living things. 6.8 **3 - I can identify and classify**- Classification of mammals. 6.8 **4 - I can conduct comparative and fair tests /2 - I can observe changes and patterns** – Teacher model – DNA extraction. 6.8	Geography – habitats across the world History – KS1 Cook voyages – classified new plants and animals Vipers – Diary from The Beagle Forest schools

				Edward Jenner, Alexander Fleming, Joseph Lister, Louis Pasteur, Anton van Leeuwenhoek, Robert Koch, Ester Lederberg		
Properties and changes of materials (Everyday materials) Y5 5.6 Burning 5.7 Acid and Bicarbonate of soda 5.8 Properties and changes of materials 5.9 Separation by filtration and sieving 5.10 Separation by Evaporation 5.11 Hardness 5.12 Transparency and magnetism 5.13 Thermal and electrical conductivity	Everyday materials Y2 Everyday materials Y1	State of matter Y4 Rocks Y3 - Mohs scale of hardness	Material properties for different projects.	I know how to 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 I know how to recognise that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution I know how to use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating I know how to give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic I know how to demonstrate that dissolving, mixing and changes of state are reversible changes I know how to 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 **<u>Scientists</u>** Antoine Lavoisier, Marianne Lavoisier, Henry Cavendish, Joseph Priestley, Carl Scheele, Sir Francis Bacon. Hippocrates, Lucas Antonius Portius, James Simpson (Chelsea Waterworks Company) Patsy O'Connell Sherman, Amadeo Avogadro, Alfred Nobel, Dorothy Hodgkin. Alexander Parkes, John Wesley Hyatt, Leo Baekeland, Eugen Bauman, Wallace Carothers, Friedrich Mohs.	**4 - I can conduct comparative and fair tests /2 - I can observe changes and patterns** – Teacher model – Fire needs oxygen. 5.6 **4 - I can conduct comparative and fair tests /1 – Observations over time /2 - I can observe changes and patterns /3 - I can identify and classify** – What happens to the mass of the candle when lit. 5.6 **3 - I can identify and classify**- Classification, 5.7 **4 - I can conduct comparative and fair tests /2 - I can observe changes and patterns /3 - I can identify and classify** – Soluble or insoluble. 5.8 **4 - I can conduct comparative and fair tests /2 - I can observe changes and patterns /3 - I can identify and classify** – Solubility of solutes. 5.8 **4 - I can conduct comparative and fair tests /2 - I can observe changes and patterns** – Reversable changes. 5.8 **4 - I can conduct comparative and fair tests /2 - I can observe changes and patterns** – Separating mixtures by sieving. 5.9 **4 - I can conduct comparative and fair tests /2 - I can observe changes and patterns** – Filtration. 5.9 **4 - I can conduct comparative and fair tests /1 – Observations over time /2 - I can observe changes and patterns /3 - I can identify and classify** – Disappearing water. 5.10 **4 - I can conduct comparative and fair tests /1 – Observations over time /2 - I can observe changes and patterns /3 - I can identify and classify** – Teacher model – Evaporation to separate solutes from solvents. 5.10 **5 - I can research using secondary sources –** Research Mohs Scale. 5.11 **3 - I can identify and classify** – Material classification. 5.11 **3 - I can identify and classify** – The hardness of materials. 5.11 **5 - I can research using secondary sources –** Research Alloys. 5.11 **4 - I can conduct comparative and fair tests /2 - I can observe changes and patterns /3 - I can identify and classify** – Transparency investigation. 5.12 **4 - I can conduct comparative and fair tests /2 - I can observe changes and patterns /3 - I can identify and classify** – Magnet strength. 5.12 **4 - I can conduct comparative and fair tests /2 - I can observe changes and patterns /3 - I can identify and classify** – Thermal conductors or insulators. 5.13 **4 - I can conduct comparative and fair tests /2 - I can observe changes and patterns**	DT – material properties for different projects. Forest school – Fire needs oxygen

				Michael Faraday, Shen Kuo, Alexander Neckam, William Gilbert, Carl Gauss. Benjamin Franklin, Prokop Divis, Nikola Tesla	**/3 - I can identify and classify** – Teacher model - Thermal conduction. 5.13 **4 - I can conduct comparative and fair tests** **/2 - I can observe changes and patterns** **/3 - I can identify and classify** – Electrical conduction. 5.13	
Animals including humans (teeth) Y4 4.2 Teeth	**Animals including humans R** **Animals including humans Y2**	Animals including humans Y3	Personal care - hygiene	I know how to identify the different types of teeth in humans and their simple functions **Scientists** Pierre Fauchard, HN Wadsworth, Hesy-Re, Edward H Angle	**4 - I can conduct comparative and fair tests** **/2 - I can observe changes and patterns -** What stains teeth? 4.2 **5 - I can research using secondary sources –** Why we brush our teeth. 4.2 **4 - I can conduct comparative and fair tests** **/2 - I can observe changes and patterns -** Why we brush our teeth. 4.2	PSHE – personal hygiene, staying healthy
Electricity Y4 (teach Y3/4 together) 4.4 Circuits 4.5 Electrical conductors		Electricity Y6 (teach Y5/6 together) Properties and changes of materials (Everyday materials) Y5 – Electrical conductivity	Understand the danger of electricity and also the great uses of electricity	I know how to identify common appliances that run on electricity I know how to construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers Identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery I know how to recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit I know how to recognise some common conductors and insulators, and associate metals with being good conductors **Scientists** Alessandro Volta, Stephen Gray, Charles du Fay, Ewald von Kleist, Benjamin Franklin, Henry Cavendish, Luigi Galvani	**3 - I can identify and classify** – Component identification. 4.4 **4 - I can conduct comparative and fair tests** **/2 - I can observe changes and patterns -** Build a circuit. 4.4 **2 - I can observe changes and patterns -** The switch. 4.4 **4 - I can conduct comparative and fair tests** **/2 - I can observe changes and patterns** **/3 - I can identify and classify** – Electrical conduction. 4.5 **3 - I can identify and classify** – Electrical appliances. 4.5	DT – Doodlers PSHE – Keeping Safe KS2, Ensure electrical safety is included. Geography – Different sources of Energy (UK) - Rivers – as a source of energy. Caretaker of the world and looking after resources.
Electricity Y6 (teach Y5/6 together) 6.5 Circuits		Electricity Y4 (teach Y3/4 together) Light Y3 Light Y6	Understand the danger of electricity and also the great uses of electricity	I know how to associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit I know how to compare and give reasons for variation in how components function, including the brightness of builds, the loudness of buzzers and the on/off position of switches. I know how to use recognised symbols when representing a simple circuit in a diagram. **Scientists** Alessandro Volta, Stephen Gray, Charles du Fay, Ewald von Kleist, Benjamin Franklin, Henry Cavendish, Luigi Galvani	**3 - I can identify and classify** – Component identification. 6.5 **4 - I can conduct comparative and fair tests** **/2 - I can observe changes and patterns -** Build a circuit. 6.5 **2 - I can observe changes and patterns -** The switch. 6.5 **4 - I can conduct comparative and fair tests** **/2 - I can observe changes and patterns –** Cells and brightness. 6.5	DT – Steady Hand Games PSHE – Keeping Safe KS2, Ensure electrical safety is included. Geography – Different sources of Energy (UK) - Rivers – as a source of energy. Golden Thread - Caretaker of the world and looking after resources Vipers – Natural Resources Y5
Earth and space Y5 5.14 Space 5.15 The earth and the moon	Neil Armstrong- First Man on the Moon Bob The Man on the Moon	Light Y3 Light Y6 Forces Y3	Understanding of our place in the solar system. Day & night, the tides Blue Marble – What our planet was called by the astronauts who first saw it.	I know how to describe the movement of the Earth, and other planets, relative to the Sun in the solar system I know how to describe the movement of the Moon relative to the Earth I know how to describe the Sun, Earth and Moon as approximately spherical bodies I know how to use the idea of the Earth's rotation to explain day and	**5 - I can research using secondary sources –** Planet information. 5.14 **3 - I can identify and classify** – Planetary sizes. 5.14 **5 - I can research using secondary sources –** The sun's movements across the sky. 5.15 **3 - I can identify and classify** – Phases of the moon 5.15 **1 – Observations over time** **/2 - I can observe changes and patterns** Phases of the moon – Moon diary	Geography – shape of the Earth Vipers – Solar System, Space Spirituality – Awareness, Awe & wonder – Goldilocks planet, Reflection – what if we were in a different position? Action – look after the world more as it is so precious.

				night and the apparent movement of the sun across the sky I know that the Sun is a star at the centre of our solar system and that it has eight planets: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune (Pluto was reclassified as a 'dwarf planet' in 2006). I know that a moon is a celestial body that orbits a planet (Earth has one moon; Jupiter has four large moons and numerous smaller ones). **Scientists** Galileo Galilei, Nicolas Copernicus, Johannes Kepler, Jocelyn Bell Burnell, William Herschel, Henrietta Swan Leavitt. Aristarchos of Samos, Eratosthenes, Ptolemy, Carolyn Porco, Tycho Brahe, Nancy Grace Norman		
Forces Y5 5.1 Gravity 5.2 Friction 5.3 Air resistance 5.4 Water resistance 5.5 Levers, pulleys and gears		Forces and magnets Y3 (Forces / Magnets)	An understanding of how things move – friction, brakes.	I know how to explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object I know how to identify the effects of air resistance, water resistance and friction, that act between moving surfaces I know how to recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect. **Scientists** Aristotle, Galileo Galilei, Isaac Newton, Albert Einstein Leonardo da Vinci, Guillaume Amontons, Charles Augustin de Coulomb, Charles Hatcbett, Theodor Reye, David Tabor. Giovanni Battista Venturi, Daniel Bernoulli. Claude Louis Navier, George Gabriel Stokes, Maurice Couette, Jean Pouseuille. Archimedes, Hero of Alexandria, Franz Reuleux, Simon Stevin	**4 - I can conduct comparative and fair tests /2 - I can observe changes and patterns –** Mass & weight. 5.1 **5 - I can research using secondary sources –** Planetary gravity. 5.1 **4 - I can conduct comparative and fair tests /2 - I can observe changes and patterns –** Does mass affect friction. 5.2 **4 - I can conduct comparative and fair tests /2 - I can observe changes and patterns –** Helicopters. 5.3 **5 - I can research using secondary sources –** Watercraft shape research. 5.4 **4 - I can conduct comparative and fair tests /2 - I can observe changes and patterns /3 - I can identify and classify** – Levers. 5.5	DT – Levers, pulleys & Gears Vipers - Forces Spirituality – awareness of awe and wonder – how do materials that normally sink, stay afloat? Reflection - cruise liner how does it stay afloat/made out of metal. Spirituality – awareness of awe and wonder – The earth's gravitational force in comparison with the moon/outer space. Reflection – how scientists discovered gravity and the first space explorers felt. Action – how does our life impact negatively on space through space debris?
Animals including humans (digestive system) Y4 (teach Y3/4 together) 4.1 The digestive system	Animals including humans Y2	Animals including humans Y3 (whole class) 3.1 Nutrition Animals including humans (circulatory system) Y6 (teach Y5/6 together NB. drugs to be taught as part of this year's PSHE) 6.2 Diet 6.3 Exercise, Drugs and lifestyle 6.4 The transport of water and nutrients	Know how your body works – the need for a balanced diet.PSHE	I know how to describe the simple functions of the basic parts of the digestive system in humans **Scientists** William Beaumont, Ivan Pavlov, Franciscus Sylvlus, Rene de Reaumur	**4 - I can conduct comparative and fair tests /2 - I can observe changes and patterns** – Model Digestive system 4.1	VIPERS – Eating and digestion Y4 The body Y4 Healthy bodies Y6 PSHE – Healthy Living/Healthy Eating PE – Striver, keeping healthy
Animals including humans (circulatory system) Y6 (teach Y5/6 together)	Animals including humans – My body R Animals including humans Y1	Animals including humans Y3 (whole class) 3.2 Skeletons	A better understanding of how the things we put into our bodies can affect us. Having a balanced diet & exercising.	I know how to identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood	**3 - I can identify and classify** – The structure of the heart. 6.1	Vipers – the human body Y4 Heart and circulatory system Y6 Health bodies Y6 PSHE – Staying Healthy, Smoking and Alcohol & Drugs

6.1 The heart and the circulatory system 6.2 Diet 6.3 Exercise, Drugs and lifestyle 6.4 The transport of water and nutrients	**Animals including humans Y2**	3.3 Muscles	Establishing early good habits with 5 ways to well-being.	I know how to recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function I know how to describe the ways in which nutrients and water are transported within animals, including humans. **Scientists** Leonardo da Vinci, William Harvey, Christiaan Barnard, Norman Bethune, Laxmi Mehta, Jennifer Mieres. Antoine Lavoisier, Marianne Lavoisier, James Lind, Rovenia Brock, Susan Powter Vittorino da Feltre, Cristobal Mendez, Mercurialis, Guts Muths, Catharine Beecher. Aristotle, Galen of Pergamon, Andreas Vesalius, Bartolomeo Eustachio, William Bowman, Frederik Ruysch	**5 - I can research using secondary sources** – Blood research 6.1 **4 - I can conduct comparative and fair tests /2 - I can observe changes and patterns** – Sugar experiment. 6.2 **2 - I can observe changes and patterns** **3 - I can identify and classify** – Sugar in foods. 6.2 **3 - I can identify and classify** – Drugs & medicines. 6.3	PSHE – Healthy Living/Healthy Eating PE – Striver, keeping healthy
State of matter Y4 4.6 Solids 4.7 Liquids 4.8 Gases 4.9 Changes of state 4.10 The water cycle	Everyday materials Y2 Everyday materials Y1	Properties and changes of materials (Everyday materials) Y5	To know that air is everywhere on Earth. To know about processes for cooking and safety. Steam and ice can burn. Understanding of the water cycle	I know how to compare and group materials together, according to whether they are solids, liquids or gases I know how to observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C) I know how to identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature. **Scientists** Johan Gutenberg, Georg Agricola, Joseph Aspin, Charles Goodyear, Irene Joliot-Curie. Archimedes, Ctesibius, Sextus Julius Frontinus, Al-Khazini, Evangelista Torriceli, Blaise Pascal, Daniel Bernoulli. Robert Boyle, Edme Mariott, Emile Clapeyron, John Dalton, Jacques Charles, Joseph Louis Gay-Lussac. Joseph Priestley, Henry Cavendish, Carl Scheele, Jean Beguin, Jons Berzelius Jacob Bjeknes, Anaximander, Anathasius Kircher, Bernard Palissy, Pierre Perault	**3 - I can identify and classify** – Classification of everyday objects. 4.6 **4 - I can conduct comparative and fair tests /2 - I can observe changes and patterns /3 - I can identify and classify** – Viscosity of liquids. 4.7 **4 - I can conduct comparative and fair tests /2 - I can observe changes and patterns /3 - I can identify and classify** – Producing an important gas. 4.8 **4 - I can conduct comparative and fair tests /1 – Observations over time /2 - I can observe changes and patterns /3 - I can identify and classify** – Rates of evaporation. 4.9 **4 - I can conduct comparative and fair tests /1 – Observations over time /2 - I can observe changes and patterns** Water cycle in a bag. 4.10	Geography – water cycle Vipers – States of matter Y4 Vipers – Coasts, The Water Cycle
Light Y3 3.11 Darkness, sunlight and reflection 3.12 Shadows	**Seasonal changes Y1**	Electricity Y6 (teach Y5/6 together) Properties and changes of materials (Everyday materials) Y5 Light Y6	Never look directly at the sun.	I know how to recognise that he/she needs light in order to see things and that dark is the absence of light I know how to notice that light is reflected from surfaces I know how to recognise that light from the sun can be dangerous and that there are ways to protect eyes I know how to find patterns in the way that the size of shadows change I know that it is not safe to look directly at the sun, even when wearing dark glasses. **Scientists**	**2 - I can observe changes and patterns /3 - I can identify and classify** – Darkness 3.11 **2 - I can observe changes and patterns /3 - I can identify and classify** – What material makes the best lens for sunglasses 3.11 **4 - I can conduct comparative and fair tests /1 – Observations over time** – Shadow length Investigation 3.12	Geography – Seasonal changes, Arctic Vipers – Light, Stage 3 & 6

				Euclid, Thomas Young, Isaac Newton, Al-Haytham		
Living things and habitats Y5 (whole class) 5.17 Animal life cycles and reproduction Plant reproduction Animals including humans Y5 5.16 The human life cycle	Animals including humans Y2 Plants Y2	Animals including humans Y3 Living things and habitats Y5 Plants Y3 Evolution and inheritance Y6	Understand the reproduction process in living things, know that they all have different stages of development and take different times. To understand what will happen as we age.	I know how to describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird I know how to describe the life process of reproduction in some plants and animals I know how to describe the changes as humans develop to old age **Scientists** Robert Hooke, Rachel Carson, Andreas Vesalius, Jane Goodall, Johann Naumann, Emily Arnesen Mark Birch-Makin, Paul Gerson Unna, Franz Greiter	**5 - I can research using secondary sources** – animal life cycles 5.17	Plant growth – outdoor garden Vipers – Living Things, Lifecycles Vipers – Female Scientists, Jane Goodall
Living things and habitats Y4 (teach Y3/4 together) 4.11 Classification 4.12 Extinction	Animals including humans Y1	Evolution and inheritance Y6 Living things and habitats Y6, 6.7 6.8	A better understanding the need for conservation.	I know how to recognise that living things can be grouped in a variety of ways I know how to explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment I know how to recognise that environments can change and that this can sometimes pose dangers and have an impact on living things. **Scientists** Theophrastus, Ulisse Aldrovandi, Robert Hooke, Terri Irwin, Maria Merlan, Maria Bachman, Carl Woese Alfred Wegener, James Hutton, Charles Lyell, Florence Bascom, Janet Vida Watson.	**3 - I can identify and classify** – Classification of buttons 4.11 **5 - I can research using secondary sources** –extinct species 4.12	Golden Thread – Caretakers of the world Vipers - Habitats Vipers – Darwins Origins and Adaptations Vipers - Conservation
Living things and habitats Y6 (teach Y5/6 together) 6.7 Micro-organisms 6.8 Classification		Living things and habitats Y4 (teach Y3/4 together) 4.11 4.12	To know that even the smallest of animals plays a part in an ecosystem.	I know how to describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals I know how to give reasons for classifying plants and animals based on specific characteristics. **Scientists** I Edward Jenner, Alexander Fleming, Joseph Lister, Louis Pasteur, Anton van Leeuwenhoek, Robert Koch, Ester Lederberg. Francis Crick, James Watson, Rosalind Franklin, Stanley Miller, Harold Urey, Jane Goodall, Carl Linnaeus	**4 - I can conduct comparative and fair tests /1 – Observations over time** – Microbial Growth 6.7 **3 - I can identify and classify** – Classification of living things. 6.8	Golden Thread – Caretakers of the world Vipers – Inventors, Franklin & Crick
Animals including humans Y4 4.3 Food chains	Animals including humans Y1 Living things and their habitats Y2	Living things and habitats Y4 (teach Y3/4 together) Living things and habitats Y4 (teach Y3/4 together) Evolution and inheritance Y6	Even the smallest animal or plant is important	I know how to construct and interpret a variety of food chains, identifying producers, predators and prey. 0 **Scientists**	**3 - I can identify and classify**- Predator, prey or producer, 4.3 **3 - I can identify and classify**- Animal classification, 4.3	DT – Sources of food. We are omnivores. Vipers - Predators

		Living things and habitats Y6 (teach Y5/6 together) Living things and habitats Y6 (teach Y5/6 together)		Charles Darwin, Carl Linnaeus, Jean-Baptiste Lamarck, Eleanor Glanville, Maria Bachman, Elizabeth Britton		
Sound Y4 4.13 An introduction to sound 4.14 How sounds travels 4.15 Sound and pitch 4.16 Sound and volume 4.17 Sound and distance	Everyday materials Y2 Everyday materials Y1	State of matter Y4 Properties and changes of materials (Everyday materials) Y5	An understanding of how sound is created.	I know how to identify how sounds are made, associating some of them with something vibrating I know how to recognise that vibrations from sounds travel through a medium to the ear I know how to find patterns between the pitch of a sound and features of the object that produced it I know how to find patterns between the volume of a sound and the strength of the vibrations that produced it I know how to recognise that sounds get fainter as the distance from the sound source increases. **Scientists** Pythagoras, Hermann von Helmholtz, Marin Mersenne, Galileo Galilei, Christian Doppler, Heinrich Hertz. Aristotle, Vitruvius, Abu Rayhan al-Biruni, Euler, Lagrange, Lord Rayleigh. Leonardo da Vinci, Alexander Graham Bell, Jean le Rond d'Alembert Heinrich Hertz Francis Galton, Lazzaro Spallanzani, Paul Langevin, Pierre Curie	**4 - I can conduct comparative and fair tests** – Twanging 4.13 **4 - I can conduct comparative and fair tests** – Sounds through liquids 4.14 **4 - I can conduct comparative and fair tests** – Sounds through gas 4.14 **4 - I can conduct comparative and fair tests** – Sounds through solids 4.14 **2 - I can observe changes and patterns** 4.14 **4 - I can conduct comparative and fair tests /2 - I can observe changes and patterns** – Pan pipes 4.15 **4 - I can conduct comparative and fair tests /2 - I can observe changes and patterns** –Measuring volume 4.16 **4 - I can conduct comparative and fair tests /2 - I can observe changes and patterns** –How far will sound travel 4.17	Music Vipers – Music History Vipers – The Orchestra
Forces and magnets Y3 (Forces / Magnets) 3.9 Friction 3.10 Magnetism	**Everyday Materials Y1**	Forces Y5 Properties and changes of materials (Everyday materials) Y5	To understand friction – brakes, ice	I know how to compare how things move on different surfaces I know how to notice that some forces need contact between two objects, but magnetic forces can act at a distance I know how to 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 I know how to describe magnets as having two poles I know how to predict whether two magnets will attract or repel each other, depending on which poles are facing I know how to compare how things move on different surfaces I know how to notice that some forces need contact between two objects, but magnetic forces can act at a distance I know how to 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 I know how to describe magnets as having two poles **Scientists**	**4 - I can conduct comparative and fair tests /2 - I can observe changes and patterns /3 - I can identify and classify** – Shoe Friction 3.9 **2 - I can observe changes and patterns** – Polar opposites 3.10 **4 - I can conduct comparative and fair tests /2 - I can observe changes and patterns** – Magnetic materials 3.10	Geography – magnetic pole Vipers – Forces & magnetism

				Isaac Newton, Leonardo da Vinci, Guillaume Amontons, Leonard Euler, Charles Augustin de Coulomb. Michael Faraday, Joseph Henry, William Sturgeon, Hans Christian Oersted, James Clerk Maxwell, Carl Friedrich Gauss		
Animals including humans Y3 (whole class) 3.1 Nutrition 3.2 Skeletons 3.3 Muscles	Animals including humans Y2		A better understanding of the role of body parts and the need for proper nutrition and exercise.	I know how to 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 I know how to identify that humans and some other animals have skeletons and muscles for support, protection and movement. **Scientists** Leonardo da Vinci, Nicholas Andry, Hugh Owen Thomas, Wilhelm Conrad Roentgen	**3 - I can identify and classify** – Nutrient Groups & Food Types 3.1 **4 - I can conduct comparative and fair tests /1 – Observations over time** **/2 - I can observe changes and patterns** – What are bones made of? 3.2 **5 - I can research using secondary sources** – Research into insect muscles 3.3	PSHE – Healthy Living/Healthy Eating PE – Striver, keeping healthy Vipers – Healthy Body & The Human Body
Animals including humans (digestive system) Y4 (teach Y3/4 together) 4.1 The digestive system	Animals including humans Y2	Animals including humans Y3 (whole class) 3.1 Nutrition Animals including humans (circulatory system) Y6 (teach Y5/6 together NB. drugs to be taught as part of this year's PSHE) 6.2 Diet 6.3 Exercise, Drugs and lifestyle 6.4 The transport of water and nutrients	Know how your body works – the need for a balanced diet.PSHE	I know how to describe the simple functions of the basic parts of the digestive system in humans **Scientists** William Beaumont, Ivan Pavlov, Franciscus Sylvius, Rene de Reaumur	**4 - I can conduct comparative and fair tests /2 - I can observe changes and patterns** – Model Digestive system 4.1	PSHE – Healthy Living/Healthy Eating PE – Striver, keeping healthy Vipers – Healthy Body Vipers – Eating & Digestion
Animals including humans (circulatory system) Y6 (teach Y5/6 together NB. drugs to be taught as part of this year's PSHE) 6.1 The heart and the circulatory system 6.2 Diet 6.3 Exercise, Drugs and lifestyle 6.4 The transport of water and nutrients	Animals including humans – My body R Animals including humans Y1 **Animals including humans Y2**	Animals including humans Y3 (whole class) 3.2 Skeletons 3.3 Muscles	A better understanding of how the things we put into our bodies can affect us. Having a balanced diet & exercising. Establishing early good habits with 5 ways to well-being	I know how to identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood I know how to recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function I know how to describe the ways in which nutrients and water are transported within animals, including humans. **Scientists** Leonardo da Vinci, William Harvey, Christiaan Barnard, Norman Bethune, Laxmi Mehta, Jennifer Mieres. Antoine Lavoisier, Marianne Lavoisier, James Lind, Rovenia Brock, Susan Powter Vittorino da Feltre, Cristobal Mendez, Mercurialis, Guts Muths, Catharine Beecher Aristotle, Galen of Pergamon, Andreas Vesalius, Bartolomeo Eustachio, William Bowman, Frederik Ruysch	**3 - I can identify and classify** – The structure of the heart. 6.1 **5 - I can research using secondary sources** – Blood research 6.1 **4 - I can conduct comparative and fair tests /2 - I can observe changes and patterns** – Sugar experiment. 6.2 **2 - I can observe changes and patterns** **3 - I can identify and classify** – Sugar in foods. 6.2 **3 - I can identify and classify** – Drugs & medicines. 6.3	PSHE – Healthy Living Vipers – Heart & Circulation Vipers – Illness & Medicine
Plants Y3 3.13 Roots	Plants R Plants Y1 Plants Y2	Living things and habitats Y6 (teach Y5/6 together)	To better understand pollination and how to look after plants.	I know how to identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers	**4 - I can conduct comparative and fair tests /1 – Observations over time** **/2 - I can observe changes and patterns** – Root View Farm 3.13	Plant growth – outdoor garden Vipers – Inventions of the future, Green Spaces

3.14 Leaves 3.15 Stems 3.16 Flowers 3.17 Plant growth (nutrients and room) 3.18 Plant growth (light and water)		6.7 Micro-organisms 6.8 Classification Evolution and inheritance Y6		I know how to 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 I know how to investigate the way in which water is transported within plants I know how to explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. **Scientists** Asa Gray, Nikolai Valivov, James Bowie Jan Ingenhousz, Agnes Arber, Marie Stopes, Charles Darwin, George Washington Carver Katherine Esau, G. Ledyard Stebbins, Agnes Arber Beatrix Potter, Priscilla Susan Bury, Gregor Mendel, Carl Linnaeus Gertrude Jekyll, Allan Octavian Hume, Lynn Margulis, Hugo von Mohl Jagadish Chandra Bose, Janaki Amal, Joseph Banks, Joseph Dalton Hooker, Jan Baptiste van Helmont	**4 - I can conduct comparative and fair tests /1 – Observations over time /2 - I can observe changes and patterns** – From what surface of the leaf is water lost 3.14 **1 – Observations over time /2 - I can observe changes and patterns** – Changing carnations 3.15 **4 - I can conduct comparative and fair tests /1 – Observations over time /2 - I can observe changes and patterns** – Investigation into Room on Germination of Seeds. 3.17 **3 - I can identify and classify** – Plant diseases from mineral deficiency. 3.17	
Electricity Y4 (teach Y3/4 together) 4.4 Circuits 4.5 Electrical conductors		Electricity Y6 (teach Y5/6 together) Properties and changes of materials (Everyday materials) Y5 – Electrical conductivity	Understand the danger of electricity and also the great uses of electricity	I know how to identify common appliances that run on electricity I know how to construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers Identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery I know how to recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit I know how to recognise some common conductors and insulators, and associate metals with being good conductors **Scientists** Alessandro Volta, Stephen Gray, Charles du Fay, Ewald von Kleist, Benjamin Franklin, Henry Cavendish, Luigi Galvani	**3 - I can identify and classify** – Component identification. 4.4 **4 - I can conduct comparative and fair tests /2 - I can observe changes and patterns -** Build a circuit. 4.4 **2 - I can observe changes and patterns -** The switch. 4.4 **4 - I can conduct comparative and fair tests /2 - I can observe changes and patterns /3 - I can identify and classify** – Electrical conduction. 4.5 **3 - I can identify and classify** – Electrical appliances. 4.5	DT - Doodlers PSHE – Keeping Safe KS2, Ensure electrical safety is included. Geography – Different sources of Energy (UK) - Rivers – as a source of energy. Caretaker of the world and looking after resources.
Electricity Y6 (teach Y5/6 together) 6.5 Circuits		Electricity Y4 (teach Y3/4 together) Light Y3 Light Y6	Understand the danger of electricity and also the great uses of electricity	I know how to associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit I know how to compare and give reasons for variation in how components function, including the brightness of builds, the loudness of buzzers and the on/off position of switches. I know how to use recognised symbols when representing a simple circuit in a diagram. **Scientists**	**3 - I can identify and classify** – Component identification. 6.5 **4 - I can conduct comparative and fair tests /2 - I can observe changes and patterns -** Build a circuit. 6.5 **2 - I can observe changes and patterns -** The switch. 6.5 **4 - I can conduct comparative and fair tests /2 - I can observe changes and patterns –** Cells and brightness. 6.5	DT – Steady Hand Games PSHE – Keeping Safe KS2, Ensure electrical safety is included. Geography – Different sources of Energy (UK) - Rivers – as a source of energy. Caretaker of the world and looking after resources Vipers – Natural Resources Y5

				Alessandro Volta, Stephen Gray, Charles du Fay, Ewald von Kleist, Benjamin Franklin, Henry Cavendish, Luigi Galvani		

Underlined – Taught in LKS2 & UKS2, appears twice