



Science Curriculum at Moulton Primary School

Intent

At Moulton Primary School our science curriculum is organised to ensure a progression in developing both knowledge and working scientifically skills. This journey begins in the EYFS, where knowledge, opportunities and experiences have been carefully designed to ensure firm foundations are in place before the children move into KS1. Each year children have the opportunity to revisit and build upon their prior learning, working towards cumulative end goals for each year group.

Our science curriculum is centred around our 'Big Ideas'- as reflected in the strands of Science: Biology, Physics and Chemistry. The concepts are built upon throughout the learning modules, deepening children's understanding of each concept as they continue on their learning journey.

Where appropriate our science studies are linked to learning in other subjects, so that connections can be made and understanding deepened. This might be links with texts studied in the reading curriculum, or links to other subjects such as DT. For example Year 2 use their knowledge of keeping healthy in science to deepen their learning in Food and Nutrition in DT, when they consider the question, 'what does healthy mean?' Year 6 use their knowledge of the circulatory system to write explanatory texts.

Prior learning is mapped into every learning module to orchestrate meaningful retrieval and connect past learning. This has an added benefit of giving new learning an organised place to be stored in the memory, and therefore retrieved. Some areas of the Science National Curriculum are very content heavy. These need revisiting for clarification and sophistication. An example of this can be seen in Year 1 through the revisiting of Animals, including humans to secure and deepen the foundational knowledge.

Intention:

Along with English and maths, Science is a core subject at Moulton Primary School. Our intention is that Science teaching:

- Inspires children to experience awe and wonder. It stimulates curiosity, creativity and innovation.
- Gives children the chance to learn through being hands-on and finding things out for themselves to gain an understanding of the world around them.
- Is exciting and practical, encouraging future generations to not only study science at secondary school, but also potentially to follow it as a career.
- Delivers the scientific knowledge and skills that pupils need to fulfil their potential and ensures all can take advantage of opportunities presented in later life.
- Is planned and sequenced so that new knowledge and skills build on what has been

taught before and towards clearly defined, ambitious end points e.g. understanding theories of Evolution and how genetic information is Inherited.

- Addresses any gaps in pupils' prior knowledge and skills (scientific, literary or numerical) so that all pupils can enjoy and achieve in science regardless of any disadvantage or SEND.

Scientific Knowledge and Skills:

Teachers at Moulton Primary School follow the National Curriculum for Science which builds skills and knowledge over time in a logical progression, systematically and explicitly so that all pupils acquire the intended knowledge and skills

Early Years Foundation Stage (EYFS)

In the EYFS, science is included within the Understanding the World area of learning. Our children mainly learn about science through games and play e.g. which objects float and sink during water play, for example. These activities help children to develop important scientific skills such as accurate observation, prediction and critical thinking.

Key Stage 1 and Key Stage 2

Certain topics are revisited each year but with increasing difficulty and with a slightly different focus each time e.g. Animals Including Humans is studied every year, with a very clear progression of knowledge and understanding over the six years: In Year 1 this involves: looking at the human body, recognising animal groups and sorting animals but by Year 6, this has developed into knowing the internal structure of the human body in relation to circulation, classifying living things based on complex characteristics and exploring scientific research into classification.

The Working Scientifically aspects of our science curriculum help children to become accurate, careful and confident practical scientists. There is a clear progression of these skills e.g. in Year 1 a child is encouraged to ask questions, carry out simple tests, record simple data and then try to answer questions but by Year 6, they will be able to plan and carry out a fair test by using equipment accurately and taking exact readings or measurements. They are also taught how to draw conclusions from their results and record them using a range of graphs and charts.

Impact:

Teachers assess pupil's science attainment weekly during science lessons and following work submitted for marking. Misconceptions are picked up and addressed within the lesson during the 'apply' stage of the learning sequence.

Teachers will keep track of children's attainment, using their ongoing science assessments. Cumulative questions will be built into lessons to capture a pupil's understanding of a Scientific skill/concept. Ongoing tracking will identify gaps and will inform future planning.

Moulton Primary sets challenging targets for all pupils' achievement based on prior attainment and in line with the aspirations of the school. We expect that 80% of our children will be working at Age Related Expectations in Science and a growing percentage to achieve Greater Depth.

Principles of Instruction:

Teaching at Moulton Primary school incorporates Barak Rosenshine's Principles of Instruction as the vehicle for high quality teaching for all. We have adopted these principles within and across lessons in all subjects as research indicates they have a substantially positive impact on pupil progress. In the science curriculum, they are not a tick list for every lesson but will be apparent within a sequence of lessons.

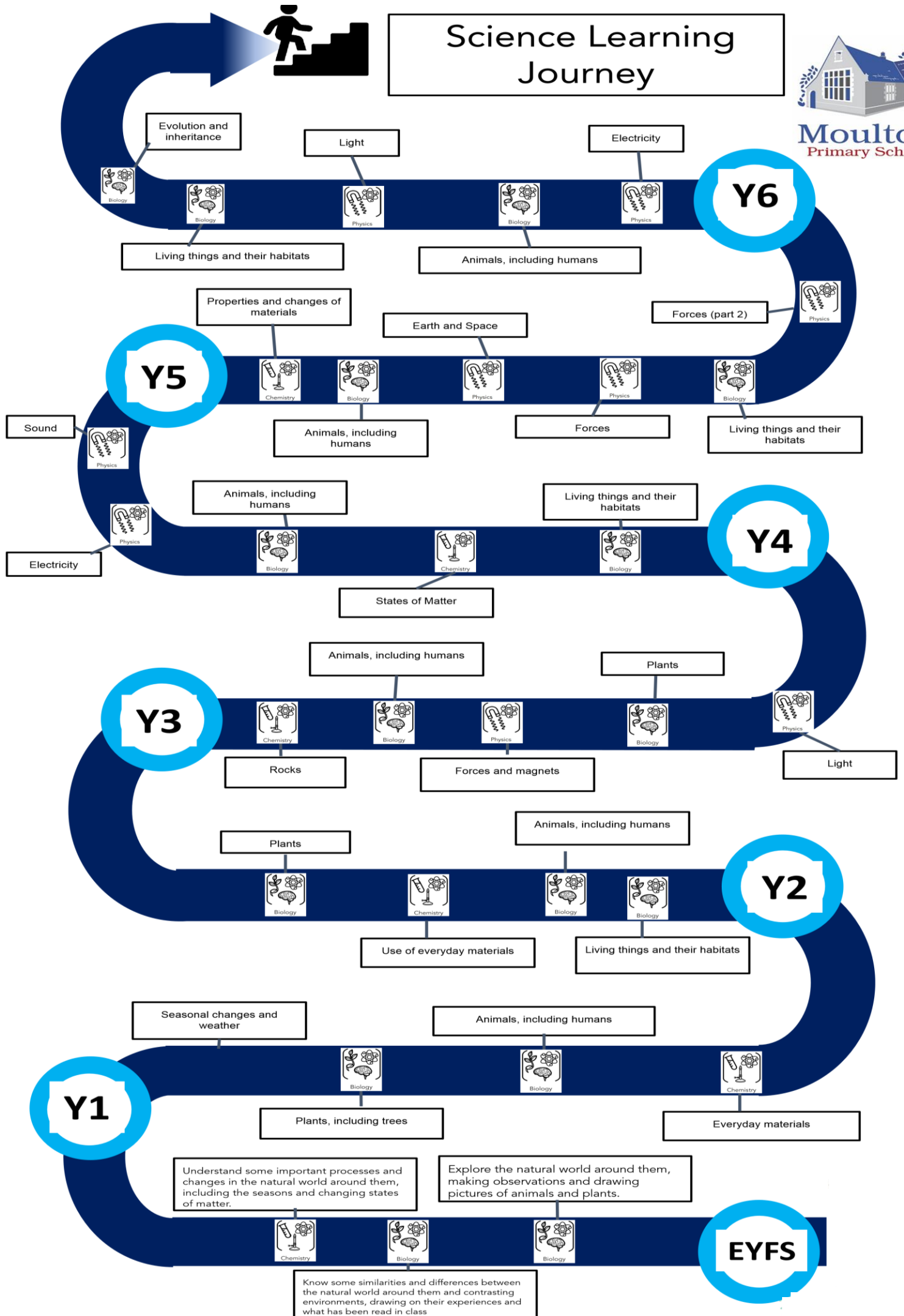
Rosenshine's Principles of Instruction	Implementation in Science
1.Begin a lesson with a short review of previous learning	Lessons build cumulatively and coherently beginning with prior learning through the use of quizzes, questions, two things, give one and get one routines. These activities help to embed learning into the long term memory and prepares the pupils to link new learning to existing schemas, building their cognitive load gradually.
2.Present new material in small steps with student practice after each new step	Lessons follow the Teach-Task cumulative model (teach-task-teach-task)which draws on the six phases of a lesson and supports coherent and effective creation of knowledge in the long-term memory. Teachers use a variety of activities and tasks to embed skills and knowledge using this format.
3.Ask a large number of questions and check responses of all pupils	Direct/ 'no hands-up' and open ended questions are used for formative assessment. Cumulative questions are interwoven into the Science curriculum to check understanding. Additional open ended 'big idea' questions are offered to all children so that they can retrieve information from prior learning.
4.Provide models	We use knowledge organisers, carefully constructed knowledge notes, worked examples, full or partially completed diagrams, high quality resources and specific vocabulary to support children with their learning. The Teach Task model ensures that alongside these worked-examples, high quality teacher modelling gives a clear understanding of key conceptions.
5.Guide Pupil Practice	Following teacher instruction, pupils are given frequent opportunities to rephrase, summarise using 'I know and I think' statements, explain, and elaborate on their work to ensure they can master the knowledge or skill. This is the stage that will allow for misconceptions to be identified and feedback to be given at the point of learning.

<p>6.Check for pupil understanding</p>	<p>Teachers check on individual understanding using a variety of application strategies in which children display their understanding; such as describing an aspect of learning, reasoning and justifying. Cumulative questions ensure that they are all able to move confidently on to the next stage.</p>
<p>7.Obtain a high success rate</p>	<p>Lessons follow a clear structure to allow for a high rate of success for all.</p> <ol style="list-style-type: none"> 1. Connect (retrieval of prior learning) 2. Explain and Example (Instruction using Teach Talk Model) 3. Attempt (deliberate practise and addressing of misconceptions) 4. Apply (guided or independent practise of knowledge and skills) 5. Challenge (to summarise, 'I know' and 'I think' statements and quiz)
<p>8.Scaffolding</p>	<p>The use of knowledge organisers, carefully constructed knowledge notes, worked examples, full or partially completed diagrams, high quality resources and specific vocabulary assist learning and help pupils strive for aspirational targets; especially those with SEND.</p>
<p>9.Independent practice</p>	<p>Lessons include opportunities for pupils to showcase their understanding of lesson content and appropriate, scientific vocabulary. Our 'thinking hard' routines are used to help pupils explain and connect their learning.</p>
<p>10.Engage in review weekly/ monthly</p>	<p>Lessons are carefully planned and sequenced to enable constant rehearsal and review of information, both within year groups and across the whole of the Science Curriculum. Cumulative questions are planned throughout the learning sequence to check understanding. This will be reviewed at the end of the learning sequence. Targets will be set and revisited again. This will embed knowledge into long term memory.</p>

Science Learning Journey



Moulton Primary School



How does our Science curriculum build on the early foundations?

Area of Learning and Development: Understanding of the World			National Curriculum
<p>Understanding the world involves guiding children to make sense of their physical world and their community. The frequency and range of children's personal experiences increases their knowledge and sense of the world around them – from visiting parks, libraries and museums to meeting important members of society such as police officers, nurses and firefighters. In addition, listening to a broad selection of stories, non-fiction, rhymes and poems will foster their understanding of our culturally, socially, technologically and ecologically diverse world. As well as building important knowledge, this extends their familiarity with words that support understanding across domains. Enriching and widening children's vocabulary will support later reading comprehension.</p>			<p>Builds knowledge and understanding so that children can access:</p> <p>Animals, including humans.</p> <p>Plants.</p> <p>Living things and their habitats.</p> <p>Seasonal changes.</p> <p>Everyday materials.</p> <p>Use of everyday materials</p>
Early Learning Goals: The natural world	Language	Opportunities and experiences (specific teaching)	Opportunities and experiences (continuous provision)
<p>Explore the natural world around them, making observations and drawing pictures of animals and plants;</p> <p>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;</p> <p>Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.</p>	<p>Plants:</p> <p>plant, tree, grass, leaves, twig / stick, ground, grow seeds, rot, change, fruit, vegetable, die, underground leaves, roots, stem, petal, familiar plant names, life cycle.</p> <p>Animals, including humans:</p> <p>eyes, ears, nose, mouth, hair, arms, hands, fingers, legs, feet, toes, same, different, (some animal names), poo, wee, sick shoulders, elbow, neck back, stomach, knees, ankles, tail, fur, whiskers, markings, grow, baby, child, adult, snot, tears, blood, differences similarities, brain, heart, bones, bottom, hips. collar bone, wrist, beak, wings, feathers, gills.</p> <p>Seasonal change:</p> <p>rain, snow, sun, wind, wet, dry, hot, cold</p>	<p>Plants:</p> <ul style="list-style-type: none"> Planting bulbs and seeds Observing growth Talk about what plants need to survive. <p>Animals including humans:</p> <ul style="list-style-type: none"> Children bring in pictures from home to show how they've changed. Observing the life cycle of chicks. Tasting, smelling, feeling (texture) different items <p>Seasonal change:</p> <ul style="list-style-type: none"> Observing changes in the park. Collecting autumn treasures. Transient art. Observing how day and night change. 	<p>Plants:</p> <p><u>Classrooms:</u> there are plants which children are encourage to look after and are used in the continuous provision and small world play</p> <p><u>Outside:</u> children look after the garden -we plant carrots, beans, potato, tomato, mint ect</p> <p>Animals and human Photos of their families are on display in the home corner. Birthday display reminding of their age.</p> <p><u>Small word play:</u> Children identify and sort different animals farm, wild, sea creatures -observe the life cycle of the chicks Playdough different fragrance (lemon,</p>

	<p>weather, day, night, light, dark, storm, thunder, lightning, rainbow, cloudy autumn, winter, spring, summer, season, hibernate Everyday materials:</p> <p>wood (twigs / sticks), leaves, soil, dough, change, senses, explore, mixture, pinecones, conkers, bark, moss sort, materials, flexible, experiment, change Environmental change:</p> <p>garden, farm, seaside, park, river, lake forest, concrete, tidy, ruin, care, places, wildlife harm , humans, nature, island, pollution</p> <p>Forces: splash, print, mark, build, knock down cogs, gears, join,, work, turn push pull, action, tools, together apart, connect, electricity, battery</p>	<ul style="list-style-type: none"> • Noticing how the weather changes. <p>Everyday materials</p> <ul style="list-style-type: none"> • Observing what happens when water changes state, e.g. ice melting. • Feeling and sorting different materials e.g. soft, hard, rough etc. <p>Environmental change:</p> <ul style="list-style-type: none"> • Recycling daily. • Keeping classroom and shared areas clean. <p>Forces:</p> <ul style="list-style-type: none"> • Through continuous provision 	<p>orange..) and different herbs and spices to add/change the smell and texture.</p> <p>Seasonal change We use natural materials -such as conkers and pine cones, remind children where we got them from. <u>maths</u> -conkers are used for counting and making patterns <u>construction</u> - conkers are used to roll down different height ramps <u>Small word</u> - natural materials are you to set scene.</p> <p>Weather - talk about the weather at the start of everyday.</p> <p>Everyday material Ice play- freeze a toy/ object in a bowl of balloon- children experiment on different ways to get the toy/object.</p> <p>Children are exposed to different materials throughout the EY environment</p> <p>Environment change: Children are encouraged to use recycle material to do DT projects</p> <p>Class rules- tidy up- putting thing back where they belong.</p> <p>Forces: Climbing frame Construction toys</p>
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Key Learning Outcomes



Moulton
Primary School

EYFS and how this transitions into Year 1

	EYFS	Year 1
<p>What will pupils know and be able to do?</p> <p>Plants</p>	<ul style="list-style-type: none"> • Know that fruit and vegetables are plants. • Know that some vegetables grow underground and they look different above and below ground. • Understand the key features of the life cycle of a plant. • Develop an understanding of growth, decay and changes over time. E.g. observing an apple. Banana rooting/school compost heap, wet pile of leaves. • Show care and concern for living things and the environment. E.g. keep plants alive by watering them. 	<ul style="list-style-type: none"> • Name some common plants/vegetation. E.g. grass, tree, bush, daisy, dandelion (and other plants and tree names local to the environment. E.g. reeds, lily pads in the school wildlife area. • Examine change over time, for example, life cycles of different plants/fruit/vegetables, growing plants from seeds, plants which go to seed (collect seeds). • Talk about simple plant parts and what happens to them. Use language e.g. leaves, roots, stem, petal. • Talk about simple similarities and differences in plants
Essential vocabulary	Seeds, rot, change, fruit, vegetable, die, underground	Leaves, roots, stem, petal, familiar plant names, life cycles
<p>What will pupils know and be able to do?</p> <p>Animals including humans</p>	<ul style="list-style-type: none"> • Show care and concern for living things and the environment. • Name obvious body parts on humans and animals. • Understand the key features of the life cycle of an animals. • Name some differences between animals, e.g. fur, colour, markings. • Name some excretions e.g. snot, tears, blood. 	<ul style="list-style-type: none"> • Talk about some similarities and difference in animals including humans. • Name all basic parts of the human body that they can see and the brain and the heart. • Observe different animal and their body parts and talk about why they have them. E.g. beak, wings, legs. • Name some habitats e.g. home of birds (garden, forest, wood and water). • Begin to talk about what their body needs e.g. food, water exercise and sleep.
Essential vocabulary	Shoulders, elbow, neck, back, stomach, knees, ankles, tail, fur, whiskers, markings, grow, baby, child, adult, snot, tears, blood, differences.	Similarities, brain, heart, bones, bottom, hips, collar bone, wrist, beak, wings, feathers, gills.

<p>What will pupils know and be able to do?</p> <p><i>Everyday materials</i></p>	<ul style="list-style-type: none"> • Explore different materials freely, to develop their ideas about how to use them and what to make. • Talk about the differences between materials and changes they notices • Use all their senses in hands – on exploration of natural materials. • Explore collections of materials with similar and/or different properties. 	<ul style="list-style-type: none"> • Know about similarities and differences in materials. • Sort materials using criteria such as soft, hard, flexible, plastic, wood and metal. • Develop their own ideas through experimentation with a diverse range of materials (EAD link). • Increasingly choose more appropriate materials for the job. E.g cotton reels, lids for wheels, wool for hair (EAD link). • Look at how materials change e.g when cooking.
<p>Essential vocabulary</p>	<p>Change, senses, explore, mixture, pinecones, conkers, bark, moss</p>	<p>Sort, materials, flexible, experiment, change.</p>
<p>What will pupils know and be able to do?</p> <p><i>Seasonal changes</i></p>	<ul style="list-style-type: none"> • Know the difference between day and night, dark and light. • Name more weather types. e.g storm, thunder, lightning, rainbow, cloudy. • Know that we wear different cloths for different weather. 	<ul style="list-style-type: none"> • Know the names of the seasons and what the weather is/can be like in each. • Talk about the changes that each seasons brings in relation to their environment: the clothes they wear, the weather and the plants. • Describe how trees and plants change in different seasons. • Know that some animals store food for winter. • Know that some animals hibernate in the winter.
<p>Essential vocabulary</p>	<p>Weather, day, night, light, dark, storm, thunder, lightning, rainbow, cloudy.</p>	<p>Autumn, winter, spring, summer, season, hibernate</p>
<p>What will pupils know and be able to do?</p> <p><i>Environmental Change</i></p>	<ul style="list-style-type: none"> • Begin to understand the effect their behaviour can have on the environment. • Begin to understand the need to respect and care for the natural environment and all living things. 	<ul style="list-style-type: none"> • Talk about the features of their own immediate environment and how environments might vary from one another. • Know some ways in which humans are harming the worlds and how to help.
<p>Essential vocabulary</p>	<p>Forest, concrete, tidy, ruin, care, places, wildlife</p>	<p>Harm, humans, nature, island pollution</p>
<p>What will pupils know and be able to do?</p>	<ul style="list-style-type: none"> • Explore how things work e.g. wind-up toys, pulleys, sets of cogs with pegs and boards. 	<ul style="list-style-type: none"> • Know how to use a variety of different tools and equipment and how they

Forces and how things work	<ul style="list-style-type: none"> Explore and talk about different forces they can feel 	work. <ul style="list-style-type: none"> Know the effect of simple push and pull forces.
Essential vocabulary	Cogs, gears, join, work, turn	Push, pull, action, tools, together, apart, connect, electricity, battery
What will pupils know and be able to do? Working Scientifically	<ul style="list-style-type: none"> Comment and ask question about aspects of their familiar world such as the place where they live or the natural world. Make observation and talk about what they see, using a wide vocabulary. Ask simple why, when, what questions. Show interest in why things happen. Describe similarities and difference. Begin to group and sort. 	<ul style="list-style-type: none"> Question why things happen, having their own ideas. Carry out observation on changes e.g. growing plants, floating and sinking, ice melting, magnets, sponges in water. Look closely at similarities and difference, patterns and change. Make observations and explain observation. Explore the natural world around them. Make predictions about what might happen. Make decisions about what to do. Describe what they see, hear and feel whilst outside.
Essential vocabulary	Group, sort, objects, compare, why, when, what	Try, test, ideas, explore, find, out, how



Year 1




	BIOLOGY	PHYSICS	CHEMISTRY
	Pupils develop an understanding of the concept of BIOLOGY through:	Pupils develop an understanding of the concept of PHYSICS through:	Pupils develop an understanding of the concept of CHEMISTRY through:
Seasonal changes and daily weather <i>Physics</i>	<ul style="list-style-type: none"> knowing and explaining what an animal is and what a plant is knowing and explaining how seasons influence plants and animals knowing and identifying the common features of fish, amphibians, reptiles, birds and mammals 	<ul style="list-style-type: none"> knowing and explaining the order of seasons knowing and explaining the changes within each season including months of the year knowing different patterns of weather and explaining, for example, how rain can occur in all seasons knowing that the earth rotates and explaining how day and night occurs 	<ul style="list-style-type: none"> knowing the properties of everyday materials, such as wood, plastic, glass, metal, water, and rock knowing and explaining the difference between an object and the material from which it is made, such as metal and a spoon knowing and explaining the properties of materials, such as hard / soft, stretchy, / stiff, rough / smooth, bendy / rigid, waterproof / not waterproof, absorbent / not absorbent, opaque / translucent / transparent knowing, explaining and grouping a range of everyday materials depending on their properties
Animals, including humans <i>Biology</i>	<ul style="list-style-type: none"> knowing, explaining and grouping animals by the types of food they eat knowing and explaining the places (habitats) that fish, amphibians, reptiles, birds and mammals live knowing and locating the main body parts of a human 		
Everyday materials <i>Chemistry</i>	<ul style="list-style-type: none"> knowing the five senses and explaining how they help compare different textures, sounds and smells knowing and identifying the basic structure of plants and trees, such as roots, bulbs, stem, leaf, flower, fruits, trunk, branch and crown 		
Plants <i>Biology</i>	<ul style="list-style-type: none"> knowing and identifying the common names of wild and garden plants knowing and identifying explaining different trees in the locality, such as oak or Scots Pine... knowing and explaining the difference between evergreen and deciduous trees, including the influence of seasons 		

Year 2

	BIOLOGY	PHYSICS	CHEMISTRY
	Pupils develop an understanding of the concept of BIOLOGY through:	Pupils develop an understanding of the concept of PHYSICS through:	Pupils develop an understanding of the concept of CHEMISTRY through:
Living things and their habitats <i>Biology</i>	<ul style="list-style-type: none"> knowing and explaining the common characteristic of living things, such as MRS GREN knowing and explaining the difference between things that are living, dead and things that have never been alive knowing and explaining what a habitat is and why plants and animals that live there are best suited to it 	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> knowing and explaining what properties everyday materials have knowing, comparing and explaining the properties and suitability of everyday materials for particular uses, such as glass in windows or bricks for building – identifying what is suitable or unsuitable knowing and explaining how the shape of everyday materials can be changed, for example by squashing, bending, twisting and stretching explaining how significant scientists have made useful things from knowing about the properties of materials, such as Charles Macintosh
Animals, including humans <i>Biology</i>	<ul style="list-style-type: none"> knowing and identifying a variety of plants and animals in micro-habitats and habitats knowing and explaining what an animal is and how they get their food from other plants and animals knowing and explaining what a simple food chain is, including the direction of energy 		
Uses of everyday materials <i>Chemistry</i>	<ul style="list-style-type: none"> knowing and explaining that animals, including humans, have offspring which grow into adults knowing and explaining simple life cycles of animals, including humans knowing and explaining that animals need water, food and air to survive knowing and explaining that to be healthy, humans need to exercise, eat the right amounts of different types of food and keep clean 		
Plants <i>Biology</i>	<ul style="list-style-type: none"> knowing and explaining what conditions are needed for seeds to germinate and mature into plants knowing and explaining how bulbs grow knowing and explaining the conditions that plants need to thrive, grow, mature, and reproduce 		






Year 3

	 BIOLOGY Pupils develop an understanding of the concept of BIOLOGY through:	 PHYSICS Pupils develop an understanding of the concept of PHYSICS through:	 CHEMISTRY Pupils develop an understanding of the concept of CHEMISTRY through:
Rocks Chemistry	<ul style="list-style-type: none"> knowing and explaining that animals, including humans, need the right types and amounts of nutrition knowing and explaining that animals only get nutrition from the food they eat – they cannot make their own food like plants 	<ul style="list-style-type: none"> knowing how objects move on different surfaces using friction and resistance to explain why knowing and explaining the difference between contact and non-contact forces 	<ul style="list-style-type: none"> knowing and explaining that rocks can be grouped together on the basis of their appearance and properties knowing and explaining how rocks are formed knowing and explaining what a rock is and what is not a rock
Animals, including humans Biology	<ul style="list-style-type: none"> knowing, identifying and explaining the purpose and function of the human skeleton, such as supporting the body, protecting the lungs and helping joints move knowing, identifying and explaining the purpose and function of the muscles, such as skeletal, cardiac or smooth muscles 	<ul style="list-style-type: none"> knowing and explaining how magnets attract and repel each other knowing and explaining how magnets attract some materials and not others 	<ul style="list-style-type: none"> knowing and explaining different types of rock, such as igneous, sedimentary and metamorphic rock knowing and explaining how fossils of animals and plants are formed knowing and explaining the different types of fossils, including body and trace fossil
Forces and magnets Physics	<ul style="list-style-type: none"> knowing and explaining the difference between vertebrates and invertebrates 	<ul style="list-style-type: none"> knowing and identifying magnetic materials knowing and explaining that a magnet has two poles, and predicting whether they will attract or repel each other 	<ul style="list-style-type: none"> knowing and explaining what soil is made from knowing and explaining the different types of material that make up soil, including rocks and organic matter
Plants Biology	<ul style="list-style-type: none"> knowing and explaining the function of the parts of flowering plants knowing and explaining what plants need to live and grow, such as air, light, water, nutrients from soil and space to grow 	<ul style="list-style-type: none"> knowing and explaining that light is needed to see things knowing and explaining that dark is the absence of light knowing and explaining that light is reflected from surfaces and enters our eyes 	
Light Physics	<ul style="list-style-type: none"> knowing how water is transported within plants and explaining the process of transpiration knowing and explaining the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal 	<ul style="list-style-type: none"> knowing that the light of the sun can be dangerous and how to protect their eyes knowing and explaining that shadows are formed when light from a source is blocked by an opaque object knowing and explaining how shadows change size 	



Year 4

	 BIOLOGY Pupils develop an understanding of the concept of BIOLOGY through:	 PHYSICS Pupils develop an understanding of the concept of PHYSICS through:	 CHEMISTRY Pupils develop an understanding of the concept of CHEMISTRY through:
Living things and their habitats Biology	<ul style="list-style-type: none"> knowing and explaining that living things can be grouped in a variety of ways, such as vertebrate or invertebrate and flowering and non-flowering plants knowing, using and explaining the classification of vertebrates, such as fish, amphibians, reptiles, birds and mammals 	<ul style="list-style-type: none"> knowing and explaining that household appliances run on electricity from mains or batteries knowing, identifying and explaining what a simple single loop circuit is (also know as a simple series electrical circuit) knowing, identifying and explaining the component of a single loop circuit, such as cells, wires, bulbs, switches and buzzers 	<ul style="list-style-type: none"> knowing and explaining what matter and state means being introduced to simple models that explain what particles are
States of matter Chemistry	<ul style="list-style-type: none"> knowing, using and explaining the classification of invertebrates, such as snails and slugs, worms, spiders and insects knowing and use classification keys to group, identify and name a variety of living things in their local environment knowing and explaining the impact on living things if their habitat changes 	<ul style="list-style-type: none"> knowing and explaining 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 knowing and explaining that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a single loop circuit knowing and identifying that some common conductors and insulators as well as associating metals with being good conductors. knowing and explaining that current is the flow of electricity through a circuit 	<ul style="list-style-type: none"> knowing and explaining the difference between solids, liquids and gases, such as solids hold their shape, liquids form a pool not a pile and gases escape from an unsealed container observing and knowing that some materials change state when they are heated or cooled, such as water evaporating or butter melting knowing and using Celsius as a measure of temperature
Animals, including humans Biology	<ul style="list-style-type: none"> knowing and identifying the parts of the human digestive system, such as the mouth, tongue, teeth, oesophagus, stomach, small and large intestine 	<ul style="list-style-type: none"> knowing and explaining how sounds are made through vibrations and travel as waves knowing and explaining how sounds travel through a medium, such as a solid (wood), a liquid (water) or gas (air) 	<ul style="list-style-type: none"> knowing and explaining the part played by evaporation and condensation in the water cycle observing, knowing and explaining how the rate of evaporation is associated with temperature
Electricity Physics	<ul style="list-style-type: none"> knowing and explaining the functions of the parts of the human digestive system, such as the mouth, tongue, teeth, oesophagus, stomach, small and large intestine knowing and explaining the different teeth that carnivores and herbivores have and why this is important for their diet 	<ul style="list-style-type: none"> knowing and explaining how sounds travel through a medium to the ear as vibrations knowing and explaining that sound is the transfer of energy knowing and explaining what pitch means – frequency of the sound wave knowing and explaining what loudness means – the size of the sound wave 	
Sound Physics	<ul style="list-style-type: none"> knowing, constructing and explaining food chains knowing and identifying producers, predators and prey in a food chain 	<ul style="list-style-type: none"> knowing, identifying and explaining patterns between the pitch of a sound and the features of the object that produced it, such as the length of an elastic band knowing, identifying and explaining patterns between the volume of a sound and the strength of the vibrations that produced it, such as the bang of a drum knowing and explaining that sounds get fainter as the distance from the sound source increases 	



Year 5

	BIOLOGY	PHYSICS	CHEMISTRY
	Pupils develop an understanding of the concept of BIOLOGY through:	Pupils develop an understanding of the concept of PHYSICS through:	Pupils develop an understanding of the concept of CHEMISTRY through:
Properties and changes of materials <i>Chemistry</i>	<ul style="list-style-type: none"> knowing, describing and explaining the changes humans go through to old age knowing and using a timeline to show stages of growth and development of humans, including puberty 	<ul style="list-style-type: none"> knowing and explaining that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object 	<ul style="list-style-type: none"> knowing, identifying and grouping the properties of everyday materials, such as hardness, solubility, transparency, conductivity (electrical and thermal) and response to magnets
Animals, including humans <i>Biology</i>	<ul style="list-style-type: none"> knowing, comparing and explaining the difference in gestation periods of humans to other animals, such as an elephant or butterfly 	<ul style="list-style-type: none"> knowing, identifying and explaining the effects of air resistance, water resistance and friction, that act between moving surfaces, such as a parachute or a brake on a bike 	<ul style="list-style-type: none"> knowing and explaining how some materials dissolve in liquid to form a solution
Forces <i>Physics</i>	<ul style="list-style-type: none"> knowing, identifying and explaining the differences in the life cycles of a mammal (dog), an amphibian (frog), an insect (ladybird) and a bird (chicken) knowing and explaining the life process of reproduction in some plants and animals knowing and explaining about a significant scientist, such as Maria Merion who David Attenborough described as one of the most important contributors to entomology 	<ul style="list-style-type: none"> knowing and explaining how significant scientists, such as Isaac Newton or Galileo Galilei helped develop the theory of gravitation knowing, experiencing and explaining how the effect of friction on movement slows or stops moving objects knowing and explaining that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect known as a force multiplier knowing and experiencing how levers, pulleys and gears multiply a smaller force to achieve a greater effect, such as removing a nail using a claw hammer, making simple pulleys and gears on a bike 	<ul style="list-style-type: none"> knowing and describing how to recover a substance from a solution knowing and using their knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating
Earth in Space <i>Physics</i>		<ul style="list-style-type: none"> knowing and identifying the eight planets in our solar system - Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune knowing and identifying Pluto as a dwarf planet knowing, identifying and explaining the movement of the Earth and other planets, relative to the Sun in the solar system knowing and explaining the movement of the Moon relative to the Earth 	<ul style="list-style-type: none"> knowing and explaining, by giving reasons based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic knowing and explaining how dissolving, mixing and changes of state are reversible changes
Living things and their habitats <i>Biology</i>		<ul style="list-style-type: none"> knowing and explaining that a moon is a celestial body that orbits a planet, such as the Moon around Earth or the four large moons of Jupiter - Io, Europa, Ganymede and Callisto first seen by Galileo Galilei knowing and explaining that the Sun, Earth and Moon are approximately spherical bodies knowing about Earth's rotation to explain day and night and the apparent movement of the sun across the sky 	<ul style="list-style-type: none"> knowing and explaining that some changes result in the formation of new materials that are not usually reversible, such as burning



Year 6

	BIOLOGY	PHYSICS	CHEMISTRY
	Pupils develop an understanding of the concept of BIOLOGY through:	Pupils develop an understanding of the concept of PHYSICS through:	Pupils develop an understanding of the concept of CHEMISTRY through:
Electricity <i>Physics</i>	<ul style="list-style-type: none"> knowing, identifying and explaining the main parts of the human circulatory system and describe the functions of the heart, aorta, pulmonary vein, left atrium, right atrium, left ventricle, right ventricle, arteries, veins and capillaries, oxygenated and deoxygenated knowing, identifying and explaining the components and function of blood, such as plasma, red blood cells, white blood cells, platelets, nutrients and oxygen 	<ul style="list-style-type: none"> knowing and explaining how a single loop circuit (series circuit) works knowing and explaining how the brightness of a lamp or the volume of a buzzer is affected by the number and voltage of cells used in a circuit 	
Animals including humans <i>Biology</i>	<ul style="list-style-type: none"> knowing and explaining the impact of diet, exercise, drugs and lifestyle on the way their bodies function knowing, describing and explaining the ways in which nutrients and water are transported within animals, including humans knowing and explaining how significant scientists helped us understand more about the circulatory system, such as Galen or William Harvey 	<ul style="list-style-type: none"> knowing, using and explaining the reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches knowing and using recognised symbols when representing a simple circuit in a diagram knowing and explaining how to be safe when working with electricity 	
Animals including humans (water transport) <i>Biology</i>	<ul style="list-style-type: none"> knowing and explaining 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 knowing and identifying the five major kingdoms of living things, including plant, animal, fungi, algae, slime and mould, and bacteria 	<ul style="list-style-type: none"> knowing and explaining that light appears to travel in straight lines knowing that light travels in straight lines to explain how objects are seen because they give out or reflect light into the eye 	
Light <i>Physics</i>	<ul style="list-style-type: none"> knowing and explaining how significant scientists, such as Aristotle or Carl Linnaeus, helped us understand more about classification knowing, using and explaining taxonomy 	<ul style="list-style-type: none"> knowing and explaining that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes knowing that light travels in straight lines to explain why shadows have the same shape as the objects that cast them 	
Living things and their habitats <i>Biology</i>	<ul style="list-style-type: none"> knowing and explaining reasons for classifying plants and animals based on specific characteristics, such as vertebrates or invertebrates knowing and using classification systems and keys to identify some animals and plants in the immediate environment knowing how to classify animals and plants they are unfamiliar with using a classification system 		
Evolution and inheritance <i>Biology</i>	<ul style="list-style-type: none"> knowing and explaining that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago, such as body fossils, mould fossils, cast fossils and trace fossils knowing and explaining that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents knowing, identifying and explaining how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution knowing and explaining about significant scientists who have helped us understand the theory of evolution, such as Alfred Wallace and Charles Darwin 		

The subject content for each year group is as follows:

	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
EYFS Needs to be mapped out	<p>Me and My Community:</p> <p>Discuss simple changes as they have grown from being a baby.</p> <p>Creep, Crawl and Wiggle:</p> <p>Plants and animals are living things. They need food and water to survive.</p>	<p>Long Ago:</p> <p>Describe simply how weather changes as the seasons change</p>	<p>Let's Explore:</p> <p>Observe and describe living things and their habitats within the local environment.</p> <p>Compare and group objects and materials according to simple given criteria.</p>	<p>Signs of Spring:</p> <p>Name and describe natural phenomena, such as the size of shadows, the colours of a rainbow, the speed of clouds moving across the sky and the strength of a wave</p>	<p>Animal Safari:</p> <p>Identify common features for different groups of animals, including wild and domestic animals.</p> <p>Big Wide World:</p> <p>Identify common features for different groups of animals, including wild and domestic animals.</p> <p>With support, observe, record and talk about living things.</p>	<p>On The Beach:</p> <p>know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read.</p> <p>Sunshine and Flowers:</p> <p>Explore the natural world around them, making observations and drawing pictures of animals and plants.</p> <p>Describe some ways that plants or animals should be cared for in order for them to survive.</p>

Year 1	Seasons and Weather Day and Night – Physics	Continue Introduce Plants, including trees – Biology	Introduce Everyday materials - Chemistry	Start Revisit Plants, Including Trees - Biology	Continue Revisit Plants, including trees- Biology	Second Revisit Animals including humans - Biology Plants Including trees - Biology
	Introduce Animals, including humans – Biology				Revisit Animals including humans - Biology	
Year 2	Introduce Living Things and Their Habitats - Biology	Introduce Animals Including Humans - Biology	Uses of Everyday Materials - Chemistry	Introduce Plants - Biology	Revisit Living Things and Their Habitats - Biology	Second Revisit Uses of Everyday Materials - Chemistry
					Revisit Everyday Materials - Chemistry	
					Revisit Plants and Animals Including Humans - Biology	Second Revisit Living Things and Their Habitats - Biology
Year 3	Introduce Rocks - Chemistry	Introduce Animals Including Humans - Biology	Introduce Forces and Magnets - Physics	Introduce Plants - Biology	Revisit Rocks - Chemistry	Revisit and Review

		Introduce Light - Physics				
Year 4	Introduce Living Things and Their Habitats - Biology	Introduce States of Matter - Chemistry	Introduce Animals Including Humans - Biology Teeth Digestion	Food Chains	Sound - Physics	Revisit and Review
				Electricity - Physics	Revisit Living Things and Their Habitats - Biology	
Year 5	Introduce Properties and Changes of Materials - Chemistry	Introduce Forces - Physics	Earth and Space - Physics	Introduce Living Things and Their Habitats - Biology	Introduce Animals Including Humans - Biology RSE	Revisit Living Things and Their Habitats - Biology Second Revisit Living Things and Their Habitats - Biology
Year 6	Introduce Living Things and Their Habitats - Biology (5/6 lessons) ensure NEW 2023 content is followed	Introduce Light - Physics	Start Introduce Animals Including Humans - Biology Circulatory System	Continue Introduce Animals Including Humans - Biology Circulatory System	Introduce Animals Including Humans - Biology - Water Transportation	Introduce Evolution and Inheritance - Biology
					Introduce Electricity - Physics	

Science Progression of Skills

National Curriculum Statements:

Working Scientifically				
<p>A high-quality science education provides the foundations for understanding the world through the specific disciplines of biology, chemistry and physics. Science has changed our lives and is vital to the world's future prosperity, and all pupils should be taught essential aspects of the knowledge, methods, processes and uses of science. Through building up a body of key foundational knowledge and concepts, pupils should be encouraged to recognise the power of rational explanation and develop a sense of excitement and curiosity about natural phenomena. They should be encouraged to understand how science can be used to explain what is occurring, predict how things will behave, and analyse causes.</p>				
	<i>By the end of EYFS</i>	<i>By the end of Year 2</i>	<i>By the end of Year 4</i>	<i>By the end of Year 6</i>
To work Scientifically	<p>Look closely at similarities, differences, patterns and change</p>	<ul style="list-style-type: none"> ● Ask simple questions ● Know how to use simple equipment ● Know how to observe closely ● Understand how to perform simple tests ● Know how to identify and classify Use observations and ideas to suggest answers to questions ● Know how to gather and 	<ul style="list-style-type: none"> ● Ask relevant questions ● To know how to set up simple practical enquiries and comparative and fair tests to know how to make accurate measurements using standard units, using a range of equipment, e.g. thermometers and data loggers. ● To know how to gather, record, classify and present data in a variety of ways to help in answering questions. ● Record findings using simple scientific language, drawings, labelled diagrams, bar charts and tables. ● Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions. Know how to use 	<ul style="list-style-type: none"> ● Plan enquiries, including recognising and controlling variables where necessary. Knows how to use appropriate techniques, apparatus, and materials during fieldwork and laboratory work. ● Know how to take measurements, using a range of scientific equipment, with increasing accuracy and precision. ● Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, bar and line graphs, and models. Report findings from enquiries, including oral and written explanations of results,

		record data to help answer questions	results to draw simple conclusions and suggest improvements, new questions and predictions for setting up further tests. <ul style="list-style-type: none">● Knows how to identify differences, similarities or changes related to simple, scientific ideas and processes.● Understands how to use straightforward, scientific evidence to answer questions or to support their findings	explanations involving causal relationships, and conclusions. Present findings in written form, displays and other presentations. Use test results to make predictions to set up further comparative and fair tests. <ul style="list-style-type: none">● Know how to use simple models to describe scientific ideas, identifying scientific evidence that has been used to support or refute ideas or arguments
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Progression of skills for Working Scientifically at Moulton Primary School:

SCIENCE		EYFS	YEAR 1	YEAR 2	YEAR 3	YEAR 4	Upper KS2 (Y5 and Y6)	
QUESTION		Ask simple questions about immediate environment.	Ask questions and know some can be answered using scientific enquiry.		Identify scientific questions. ie can be investigated through scientific enquiry.		Raise scientific questions and hypothesise	
	OBSERVE	Qualitative Talk about similarities and differences.	Qualitative and Simple Quantitative		Qualitative and Quantitative		Qualitative and Quantitative	
			Observe change over time. Use senses/ equipment.	Measure change over time e.g. plant growth. Select equipment	Systematic / careful observations. Use bar charts, pictograms, tables.	Accurate measurements Use time graphs and other graphs.	Accurate/ precise measurements, Diagrams, tables, bar and line graphs.	Take repeat readings when appropriate. Scatter graphs.
	CLASSIFY and FIND PATTERNS	Talk and Sort	Identify and Classify		Classify and Find Patterns		Classify and Find Patterns	
		Use simple scientific criteria.	e.g. familiar plants, animals, materials Compare and contrast	e.g. living/ dead/ never alive; materials Compare differences	Classify animals/ materials. Link two variables e.g. <i>find patterns in the way that the size of shadows change.</i>	Use simple classification keys to help group identify and name living things.	Use complex classification keys. Identify causal relationships.	Develop classification keys. Identify evidence that supports/ disproves causal relationships.

CONTROL INVESTIGATIONS: comparative and fair testing	Explore objects/ materials/ living things/ resources designed to model scientific processes.	Simple comparative tests		Comparative and fair tests		Design own comparative and fair tests	
		e.g. <i>What is the best material for an umbrella?</i>	e.g. <i>What if plants do not get light and water?</i>	Predict. Fair tests e.g. <i>How does distance affect magnet strength?</i>	Predict. Language of independent and control variable (States of matter)	Identify when and how to use tests. Recognise and control variables. Make predictions based on previous test results.	
RESEARCH	Listen and respond to stories about scientific processes/ events/ objects.	Find information using given sources. e.g. <i>animals.</i>	Select information from a range of given sources.	Research using given sources. e.g. <i>research different food groups and how they keep us healthy</i>	Select information to support findings. e.g. <i>research animals</i>	Explore relevant information by using a wide range of secondary sources.	
						Explore how scientific ideas have developed over time.	Identify evidence that has been used to support or disprove ideas.
CONCLUDE	Explain state simple observations	<ul style="list-style-type: none"> • using their observations and ideas to suggest answers to questions • gathering and recording data to help in answering questions 		<ul style="list-style-type: none"> • recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables • reporting on findings from 		<ul style="list-style-type: none"> • recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, 	

			<p>enquiries, including oral and written explanations, displays or presentations of results and conclusions</p> <ul style="list-style-type: none"> • 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 	<p>bar and line graphs</p> <ul style="list-style-type: none"> • 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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National Curriculum Programme of Study - Science

	By the end of EYFS	By the end of Year 1	By the end of Year 2	By the end of Year 3	By the end of Year 4	By the end of Year 5	By the end of Year 6
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<p>Animals, including humans</p>	<p>Making observations about animals</p> <p>Drawing pictures of animals</p>	<p>Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals.</p> <p>Identify and name a variety of common animals that are carnivores, herbivores and omnivores.</p> <p>Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets)</p> <p>Identify, name, draw and label the basic parts of the human body and say which part of the body is</p>	<p>To know that animals, including humans, have offspring which grow into adults.</p> <p>To know and describe the basic needs of animals, including humans, for survival (water, food and air).</p> <p>Know and describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.</p>	<p>To identify and know 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.</p> <p>Identify and know that humans and some animals have skeletons and muscles for support, protection and movement.</p>	<p>Describe the simple functions of the basic parts of the digestive system in humans. Identify the different types of teeth in humans and their simple functions.</p> <p>Construct and interpret a variety of food chains, identifying producers, predators and prey.</p>	<p>To describe the changes as humans develop to old age</p>	<p>Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood</p> <p>Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function</p> <p>Describe the ways in which nutrients and water are transported within animals, including humans.</p>
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		associated with each sense.					
Plants	<p>Children should know about similarities and differences in relation to places, objects, materials and living things.</p> <p>They talk about the features of their own immediate environment and how environments might vary from one another.</p> <p>They make observations of plants and explain why some things occur, and</p>	<p>Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees.</p> <p>Identify and describe the basic structure of a variety of common flowering plants (seeds, roots etc.) including trees.</p>	<p>To observe and know how seeds and bulbs grow into mature plants.</p> <p>To find out and describe how plants need water, light and suitable temperature to grow and stay healthy.</p>	<p>Identify, know and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers.</p> <p>Explore and know 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.</p> <p>Investigate and understand the way in which water is transported within plants.</p> <p>Explore the part that flowers</p>			

	talk about changes.			play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.			
Living things and their habitats.			<p>Explore and compare difference between things that are living, dead and things that have never been alive.</p> <p>Identify that most living things live in habitats to which they are suited and describe how different habitats provide for the needs of different kinds of animals and plants, and how they</p>	<p>identify and name a variety of living things (plants and animals) in the local and wider community.</p> <p>Give reasons for classifying plants and animals based on specific characteristics.</p> <p>Recognise that environments are constantly changing and that this can sometimes pose dangers to specific habitats.</p>	To know and describe the difference in the life cycles of a mammal, an amphibian, an insect and a bird.	<p>Describe how living things are classified into broad groups according to common observable characteristic and based on similarities and differences, including micro organisms, plants and animals.</p> <p>Give reasons for classifying plants and animals based on specific characteristics.</p> <p><u>Evolution and inheritance</u></p>	

depend on
each other.

Recognise that
livings have
changed over
time and that
fossils provide
information
about living
things that
inhabited the
Earth millions of
years ago.

Recognise that
living things
produce
offspring of the
same kind, but
normally
offspring vary
and are not
identical to
their parents.

Identify how
animals and
plants are
adapted to suit
their
environment in
different ways
and that
adaptation
may lead to
evolution.

<p>Everyday Materials</p>		<p>Distinguish between an object and the material from which it is made.</p> <p>Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water and rock.</p> <p>Describe the physical properties of a variety of everyday materials.</p> <p>Compare and group together a variety of everyday materials based on their simple physical properties.</p>	<p>Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses.</p> <p>Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.</p>		<p><u>States of Matter</u></p> <p>Compare and group materials together, according to whether they are solids, liquids or gases.</p> <p>Observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees celsius.</p> <p>Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.</p>	<p><u>Properties and changes of Materials</u></p> <p>Compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets.</p> <p>Know that some materials will dissolve in liquid to form a solution and describe how to recover a substance from a solution.</p> <p>Use knowledge of solids, liquids and gases to decide how mixtures might</p>	
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						<p>be separated, including through filtering, sieving and evaporating.</p> <p>Give reasons based on evidence from comparative and fair tests for the particular uses of everyday materials, including metals, wood and plastic.</p> <p>Demonstrate that dissolving, mixing in and changes of state are reversible changes.</p> <p>Explain that some changes result in the formation of new materials, and that this kind of change</p>	
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						is not usually reversible, including changes associated with burning and the action of acid on the bicarbonate of soda.	
Light				<p>Recognise that they need light in order to see things and that dark is the absence of light.</p> <p>Notice that light is reflected from surfaces.</p> <p>Recognise that light from the sun can be dangerous and that there are ways to protect to the eyes.</p> <p>Recognise that shadows are formed when light from a light source is</p>			<p>Recognise that light appears to travel in straight lines use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye.</p> <p>Explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes.</p>

				<p>blocked by a solid object.</p> <p>Find patterns in the way that the size of shadows change.</p>			<p>Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.</p>
Seasonal Changes		<p>Observe and talk about changes across the four seasons.</p> <p>Observe and describe weather associated with the seasons and how day length varies, including understanding that it is unsafe to look directly at the Sun.</p>					
Sound					<p>Identify how sounds are made, associating some of them with something vibrating.</p>		

					<p>Recognise that vibrations from sounds travel through medium to the ear.</p> <p>Find patterns between pitch of a sound and features of the object that produced it.</p> <p>Find patterns between the volume of a sound and the strength of the vibrations that produced it.</p> <p>Recognise that sounds get fainter as the distance from the sound's source increases.</p>		
Earth and Space						Describe the movement of the Earth, and other planets, relative to the	

						<p>Sun in the solar system.</p> <p>Describe the movement of the Moon relative to the Earth.</p> <p>Describe the Sun, Earth and Moon as approximately spherical bodies.</p> <p>Use the idea of the Earth's rotation to explain day and night, and the apparent movement of the Sun across the sky.</p>	
Forces				<p>Compare how things move on different surfaces.</p> <p>Notice that some forces need contact between 2 objects, but</p>		<p>Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object.</p>	

				<p>magnetic forces can act at a distance. Observe how magnets attract or repel each other and attract some materials and not others.</p> <p>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.</p> <p>Describe magnets as having 2 poles.</p> <p>Predict whether 2 magnets will attract or repel each other, depending on which poles are facing.</p>		<p>Identify the effects of air resistance, water resistance and friction that act between moving surfaces.</p> <p>Recognise that some mechanisms including levers, pulleys and gears allow a smaller force to have a greater effect.</p>	
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Electricity					<p>Identify common appliances that run on electricity.</p> <p>Construct a simple series of electrical circuits. Identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers.</p> <p>Identify whether or not a lamp will light in a simple series circuit based on whether or not the lamp is part of a complete loop with a battery.</p> <p>Recognise that a switch opens and closes a circuit and associate this</p>		<p>Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit.</p> <p>Compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches.</p> <p>Use recognised symbols when representing a simple circuit in a diagram.</p>
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					<p>with whether or not a lamp lights in a simple series of circuit.</p> <p>Recognise some common conductors and insulators and associate metals with being good conductors.</p>		
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	Unit title and substantive focus	Previous Learning	Big Ideas/ Key Questions/Learning focus	Tier 2 Vocabulary (Multiple Meaning or High Frequency)	Tier 3 Vocabulary (Subject Specific)
EYFS	KUW: Explore the natural world around them, making observations and drawing pictures of animals and plants	N/A		senses young feather fur seed bark wild branch plant tree fruit flower roots leaf garden living grow	wild domestic stem
EYFS	KUW: 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.	N/A		hard soft stretch bend sand snow sun sea	materials
EYFS	KUW: Understand some important processes and changes in the	N/A		weather sun rain snow	month season spring summer

	natural world around them, including the seasons and changing states of matter.			cloud day night	autumn winter
Year 1	<p>Seasons and weather Day and Night</p> <p>Physics The study of energy forces mechanics waves structure of atoms physical universe</p>	<p>Managing Self Manage their own basic hygiene and personal needs, including dressing, going to the toilet, and understanding the importance of healthy food choices.</p> <p>The Natural World Explore the natural world around them, making observations and drawing pictures of animals and plants.</p> <p>Understanding some important processes and changes in the natural world around them, including seasons and changing states of matter.</p>	<p>Seasons and weather What are the four seasons? What's the weather like in Autumn, Winter, Spring and Summer?</p> <p>Day to night Why does day become night?</p>	dawn dusk mild rotate soaked weather	month season spring summer autumn winter
Year 1	<p>Animals, including humans.</p> <p>Biology</p>	<p>Managing Self Manage their own basic hygiene and personal needs, including dressing,</p>	<p>Animals What is an animal? What types of animals are there?</p>	blood senses young feathers fur	mammal amphibian reptile herbivore carnivore

	<p>The study of living things, including:</p> <ul style="list-style-type: none"> - Types of animal - Food animals eat - Senses 	<p>going to the toilet, and understanding the importance of healthy food choices.</p> <p>The Natural World Explore the natural world around them, making observations and drawing pictures of animals and plants.</p> <p>Understanding some important processes and changes in the natural world around them, including seasons and changing states of matter.</p>	<p>What is similar and what is different?</p> <p>Eating What does food tell us about an animal?</p> <p>Senses What makes me an animal? What senses do I have?</p>	<p>scales</p>	<p>omnivore</p>
Year 1	<p>Common plants and trees in a local environment</p> <p>Biology</p> <p>The study of living things, including:</p> <ul style="list-style-type: none"> - Types of animal - Food animals eat - Senses 	<p>Managing Self Manage their own basic hygiene and personal needs, including dressing, going to the toilet, and understanding the importance of healthy food choices.</p> <p>The Natural World Explore the natural world around them, making observations</p>	<p>Structure of plants What are the parts of a plant?</p> <p>Wild and common plants What are wild plants and where do you find them? What are garden plants and where do you find them?</p> <p>Trees What makes a tree? What types of tree are there? (Trees that live around my school)</p>	<p>bud trunk branch bark seed wild</p>	<p>nutrients stem deciduous evergreen</p>

		<p>and drawing pictures of animals and plants.</p> <p>Understanding some important processes and changes in the natural world around them, including seasons and changing states of matter.</p>	<p>What's the difference between trees?</p>		
Year 1	<p>Everyday Materials</p> <p>Chemistry</p> <p>The study of the composition, behaviour and properties of matter</p>	<p>Managing Self</p> <p>Manage their own basic hygiene and personal needs, including dressing, going to the toilet, and understanding the importance of healthy food choices.</p> <p>The Natural World</p> <p>Explore the natural world around them, making observations and drawing pictures of animals and plants.</p> <p>Understanding some important processes and changes in the natural world around them, including seasons and</p>	<p>Materials</p> <p>What are materials? What are things made of in school?</p> <p>Properties</p> <p>How can I describe materials? Which materials are waterproof and which are not? Which materials are transparent and which are opaque?</p> <p>Use what you know</p> <p>What's the best material for the job? Why?</p>	<p>absorb rough smooth waterproof metal plastic</p>	<p>materials properties flexible transparent opaque physical</p>

		changing states of matter.			
Year 2	<p>Living Things and Their Habitats</p> <p>Biology</p> <p>The study of living things, including characteristics of living things Relationship of living things and their environment</p>	<p>EYFS – Natural Word</p> <p>Y1 Plants</p> <p>Y1 Animals including humans</p>	<p>Characteristics of living things</p> <p>What is alive and what is not? What do all living things have in common?</p> <p>Location of living things</p> <p>Where do plants and animals live? What plants and animals live in our local environment?</p> <p>How living things are connected</p> <p>What are food chains? How are they connected? Why do plants and animals need each other?</p>	<p>thrive depend producer consume prey predator</p>	<p>oxygen nutrition respiration sensitivity reproduction excretion</p>
Year 2	<p>Animals, including humans</p> <p>Biology</p> <p>The study of living things, including: Reproduction Basic needs Diet and exercise for humans</p>	<p>EYFS – Natural Word</p> <p>Y1 Plants</p> <p>Y1 Animals including humans</p>	<p>Animals and change</p> <p>REMEMBER: what is an animal? How do animals change as they mature?</p> <p>Air, water and food</p> <p>How do we change as we mature? What do all animals need to stay alive?</p>	<p>healthy survive exercise heart lungs muscles</p>	<p>hygiene larva pupa vertebrates invertebrates metamorphosis</p>

			<p>Health and food Keeping healthy: why do we exercise? Keeping healthy: why do we eat different types of food?</p>		
Year 2	<p>Use of Everyday Materials</p> <p>Chemistry The study of the composition, behaviour and properties of matter</p>	<p>EYFS Natural world</p> <p>Y1 Everyday materials</p>	<p>Materials What are materials used for? Categorise and compare wood, metal, plastic and glass. What are materials used for? Categorise and compare ceramics, rock, paper and card, and fabric.</p> <p>Changes What happens when we squash, bend, twist or stretch a material?</p> <p>Purpose What's the right material for the job? What's the most absorbent material? Who invented waterproofing?</p>	<p>artificial brittle extracted fabric manufactured natural</p>	<p>ceramic durable inflexible reflective rigid translucent</p>
Year 2	<p>Plants</p> <p>Biology The study of living things, including</p>	<p>EYFS – Natural Word</p> <p>Y1 Plants</p>	<p>Growing from a seed How do seeds germinate and what happens?</p>	<p>wither dormant mature bulb anchor</p>	<p>germination perennial carbon dioxide glucose</p>

	<p>Growth Health Relationship of living things and their environment</p>	<p>Y1 Animals, including humans</p> <p>Y2 Living things and their habitats</p>	<p>Growing from a bulb What happens when bulbs sprout?</p> <p>Healthy plants What do plants need to thrive and be healthy? What can happen if plants don't get the things they need? What do I notice about plants around the school? How are they healthy? How are they unhealthy?</p> <p>Show what you know How do seeds and bulbs grow? What do plants need to be healthy?</p>	<p>sustain</p>	<p>clone</p>
<p>Year 3</p>	<p>Rocks</p> <p>Chemistry The study of the composition, behaviour and properties of matter</p>	<p>Y1 Everyday materials</p> <p>Y2 Use of everyday materials</p>	<p>Types How are rocks formed? What types of rocks are there?</p> <p>Change Can rocks change? How can we test a rock to see if it is limestone or chalk?</p> <p>Soil Is soil just dirt? What makes soil?</p>	<p>cemented compacted decay prehistoric soil transform</p>	<p>fossil igneous magma metamorphic minerals sedimentary</p>

			<p>Fossils How are fossils formed?</p> <p>Elaborate and remember rocks, soils and fossils.</p>		
Year 3	<p>Animals, Including Humans</p> <p>Biology</p> <p>The study of living things, including: Amount and type of nutrition Structure of humans and animals</p>	<p>EYFS Natural world</p> <p>Y1 Animals, including humans</p> <p>Y2 Animals, including humans</p> <p>Y2 Living things and their habitats</p>	<p>Food What effect does the food we eat have?</p> <p>Skeleton Where is my skeleton and what does it do?</p> <p>Muscle Where are my muscles and what do they do?</p>	<p>minerals skeleton skull voluntary involuntary nerves</p>	<p>biceps triceps vertebrae vitamins proteins carbohydrates</p>
Year 3	<p>Forces and Magnets</p> <p>Physics</p> <p>The study of energy forces mechanics waves structure of atoms physical universe Earth in Space</p>	<p>Y1 Seasonal changes</p> <p>Y1 Everyday materials</p> <p>Y2 Uses of everyday materials</p>	<p>Contact force and friction What are contact forces? How do surfaces affect the motion of an object? How does friction affect moving objects?</p> <p>Non-contact force What is a non-contact force? How is this different to a contact force?</p> <p>Magnetic force How do magnets attract and repel? Which materials are magnetic?</p>	<p>consequence contact force attract north south</p>	<p>magnet resistance friction repel pole magnetic field</p>

			Forces and magnetism summary.		
Year 3	<p>Light</p> <p>Physics</p> <p>The study of energy forces mechanics waves structure of atoms physical universe Earth in Space</p>	<p>Y1 Seasonal changes</p> <p>Y1 Everyday materials</p> <p>Y2 Uses of everyday materials</p> <p>Y3 Forces and magnets</p>	<p>Seeing</p> <p>Do we need light to see things?</p> <p>Shadows</p> <p>How are shadows formed?</p> <p>Changing variables</p> <p>What happens to the size of a shadow when the object moves closer to, or away from, the light source?</p>	<p>absence</p> <p>cast (shadow)</p> <p>impenetrable</p> <p>reflect</p> <p>shadow</p> <p>source (light)</p>	<p>constant</p> <p>dependent</p> <p>independent</p> <p>illuminate</p> <p>translucent</p> <p>variable</p>
Year 4	<p>Living Things and Their Habitats</p> <p>Biology</p> <p>The study of living things, including:</p> <p>Grouping</p> <p>Classification</p> <p>Environmental change and impact</p>	<p>Y1 Plants</p> <p>Y1 Animals, including humans</p> <p>Y2 Living things and their habitats</p> <p>Y2 Plants</p> <p>Y3 Plants</p>	<p>Living things</p> <p>What are the characteristics of living things?</p> <p>Vertebrates and invertebrates</p> <p>What animals are vertebrates?</p> <p>What animals are invertebrates?</p> <p>Plants</p> <p>What groups are plants classified in? Classification keys What is classification? How do I use a key?</p> <p>Environmental changes</p> <p>What happens if the</p>	<p>classification</p> <p>environment</p> <p>interdependence</p> <p>interact</p> <p>beneficial</p> <p>hierarchy</p>	<p>vertebrate</p> <p>invertebrate</p> <p>biotic</p> <p>ecosystem</p> <p>species</p> <p>niche</p>

			environment in a habitat changes?		
Year 4	<p>States of Matter</p> <p>Chemistry</p> <p>The study of the composition, behaviour and properties of matter</p>	<p>Y1 Everyday materials</p> <p>Y2 Use of everyday materials</p> <p>Y3 Forces and magnets</p>	<p>What is matter?</p> <p>What does 'state' mean?</p> <p>What are solids, liquids and gases?</p> <p>Melting: how do materials change state?</p> <p>Evaporating: how do materials change state?</p> <p>Condensing: how do materials change state?</p> <p>Summary: how do materials change their state of matter?</p>	<p>permanent</p> <p>particle</p> <p>solid</p> <p>liquid</p> <p>gas</p> <p>vapour</p>	<p>evaporate</p> <p>condense</p> <p>melt</p> <p>matter</p> <p>state</p> <p>volume</p>
Year 4	<p>Animals Including Humans</p> <p>Biology</p> <p>The study of living things, including:</p> <p>Structure of digestive system</p> <p>Function of digestive system</p> <p>Relationship</p> <p>Food chains</p>	<p>Y1 Plants</p> <p>Y1 Animals, including humans</p> <p>Y2 Living things and their habitats</p> <p>Y2 Plants</p> <p>Y3 Plants</p> <p>Y4 Living things and their habitats</p>	<p>Teeth and eating</p> <p>What teeth do humans have?</p> <p>What do they do?</p> <p>How does our mouth and teeth help digestion?</p> <p>What's the process?</p> <p>Can teeth tell us what animals eat?</p> <p>The digestive system</p> <p>What are the parts of the digestive system?</p> <p>What do they do?</p>	<p>expel</p> <p>compact</p> <p>digestion</p> <p>acid</p> <p>stomach</p> <p>intestines</p>	<p>incisor</p> <p>canine</p> <p>molar</p> <p>enzyme</p> <p>saliva</p> <p>peristalsis</p>

			<p>How does digestion work? What's the process?</p> <p>Food chains What are food chains How do they work? How do I construct and interpret a food chain?</p> <p>SUMMARY How are teeth, digestion and food chains connected?</p>		
Year 4	<p>Electricity</p> <p>Physics The study of energy forces mechanics waves structure of atoms physical universe Earth in Space</p>	<p>Y1 Seasonal changes</p> <p>Y1 Everyday materials</p> <p>Y2 Uses of everyday materials</p> <p>Y3 Forces and magnets</p>	<p>Sources of electricity What appliances use electricity? What sort of power makes them work?</p> <p>Components Name it - what are the components in a simple series circuit?</p> <p>Apply what you know Diagnose it – what are the effects of changing circuit components and batteries?</p>	<p>associate identify portable effect appliance series</p>	<p>component electrical insulator electrical conductor circuit hypothesis variable</p>
Year 4	<p>Sound</p> <p>Physics The study of energy forces mechanics waves structure of</p>	<p>Y1 Seasonal changes</p> <p>Y1 Everyday materials</p> <p>Y2 Uses of everyday materials</p>	<p>Properties What is sound?</p> <p>Movement How does sound travel?</p>	<p>produce property source frequent regular affect</p>	<p>vibrate pitch volume medium vacuum sound wave</p>

	atoms physical universe Earth in Space	Y3 Forces and magnets Y4 Electricity	Pitch and loudness What is the pitch and loudness of sound?		
Year 5	Properties and changes of materials Chemistry The study of the composition, behaviour properties of matter	Y1 Everyday materials Y2 Uses of everyday materials Y3 Rocks Y3 Light Y4 States of matter	Properties, mixtures and solutions What properties do materials have? How do we use them? What is a mixture? What is a solution? (Solubility) Separation of materials How can we separate materials from a mixture? (Sieving and filtration) How can we separate materials from a solution? (Evaporation) Reversible and irreversible change What changes are reversible? What changes are irreversible?	property particle separate combine recover comparative	atom molecule chemical (changes) physical (changes) reversible reaction
Year 5	Animals, including humans Biology The study of living things	Y1 Animals, including humans Y2 Animals, including humans	Life What is the human timeline? Growth How do we change into adults?	development diverse unique generation mature equipped	adolescence puberty gestation embryo foetus womb

	Lifespan and life cycle Change and growth	Y3 Animals, including humans Y4 Animals, including humans	Compare How do human and animal lifespans compare?		
Year 5	Forces Physics Matter Forces and motion Sound, light and waves Electricity and magnetism Earth in Space	Y3 Forces and magnetism Y3 Light Y4 States of matter Y4 Electricity Y4 Sound	Non-contact and contact forces Remember gravity. When is friction helpful and when is it not? Resistance What is the effect of air resistance? Air resistance investigation What's the effect of water resistance? Levers, pulleys and gears How do levers help us? How do pulleys and gears help us?	opposite reaction advantage displace weight mass	pulley gear pivot fulcrum lever upthrust
Year 5	Earth and Space Physics Matter Forces and motion Sound, light and waves Electricity and magnetism Earth in Space	Y3 Forces and magnetism Y3 Light Y4 States of matter Y4 Electricity Y4 Sound Y5 Forces	Position, relationship / movement of planets / spherical bodies. What are the planets in our solar system? (Planet comparison) How does the view of the Moon change in a solar month? (Moon phases, moon diaries) The effect of the Earth's rotation, tilt and orbit has on day, night and seasons.	luminous phenomenon attraction approximately relative apparent	orbit axis crescent gravitational waxing waning

			<p>Why does the rotation of the Earth result in day and night? Why is the Earth's tilt (axis) responsible for the seasons?</p>		
Year 5	<p>Living Things and their Habitats</p> <p>Biology The study of living things, including: Structure Order Life cycles Reproduction</p>	<p>Y1 Plants</p> <p>Y2 Plants</p> <p>Y3 Plants</p> <p>Y3 Living things and their habitats</p> <p>Year 4 Living things and their habitats</p>	<p>Mrs GREN Recap of life processes</p> <p>Life Cycles What's the difference between a mammal and amphibian? What's the difference between an insect and a bird? What is similar and what is different between the life cycle of a mammal, amphibian, insect and bird?</p> <p>Inspirational scientists Who was Maria Merion and what did she do?</p> <p>Reproduction How do living things reproduce? Plants and animals – what's the life process of reproduction.</p>	<p>deduce process re-form transform adolescence contrast</p>	<p>embryo sexual metamorphosis incubate biochemical fertilisation</p>
Year 6	<p>Living things and their habitats.</p> <p>Biology</p>	<p>Y1 Plants</p> <p>Y2 Plants</p>	<p>Pioneering scientists Who was the scientist Carl Linnaeus and what did he do?</p>	<p>Characteristic Interdependence Specific Categorise</p>	<p>Fungus Arthropod Taxonomy Kingdom</p>

	<p>The study of living things, including Pioneering scientists Classification</p>	<p>Y3 Plants</p> <p>Y3 Living things and their habitats</p> <p>Year 4 Living things and their habitats</p> <p>Y5 Living thing and their habitats</p>	<p>Classification</p> <p>How do we classify vertebrates? How do we classify invertebrates we know? How do we classify invertebrates we don't know? How do we classify invertebrates we don't know?</p> <p>Apply</p> <p>What animals can I classify? What animals and plants exist in my local environment?</p>	<p>Primitive Hierarchy</p>	<p>Phylum Genus</p>
Year 6	<p>Light</p> <p>Physics</p> <p>Matter</p> <p>Forces and motion</p> <p>Sound, light and waves Electricity and magnetism</p> <p>Earth in Space</p>	<p>Y1 Everyday materials</p> <p>Y2 Uses of everyday materials</p> <p>Y3 Light</p> <p>Y4 States of matter</p> <p>Y4 Sound</p> <p>Y4 Electricity</p> <p>Y5 Forces</p> <p>Y5 Earth in Space</p>	<p>Properties of light</p> <p>How does light travel? What colour is light made of?</p> <p>Reflection</p> <p>Reflection - how does light help us to see objects? Which surfaces make the best reflectors?</p> <p>Colour</p> <p>Why do we see objects as a particular colour?</p> <p>Refraction</p> <p>What happens to the appearance of objects when placed in water?</p>	<p>Impurity</p> <p>Emit</p> <p>Absorb</p> <p>Constituent</p> <p>Filter</p> <p>Artificial</p>	<p>Refraction</p> <p>Incidence</p> <p>Spectrum</p> <p>Prism</p> <p>Lux</p> <p>Piment</p>

<p>Year 6</p>	<p>Animals, including humans</p> <p>Biology</p> <p>The study of living things Structure and function of the circulatory system Health and exercise</p>	<p>Y1 Animals, including humans identify animals – mammal, reptile, bird, amphibian, fish</p> <p>Y2 Animals, including humans Reproduction and basic needs</p> <p>Y3 Animals, including humans Nutrition Structure of humans and animals</p> <p>Y4 Animals, including humans Human digestion</p> <p>Y5 Animals, including humans Lifespans and life cycles, growth and change</p>	<p>Blood and blood vessels What is blood made of and why do we need it? Why do our bodies need nutrients and how are they transported? What is our circulatory system?</p> <p>The functions of the heart What is our heart like inside? How does it work? Who influenced what we know about our circulatory system?</p> <p>The effect of exercise, drugs and lifestyle What can we do to keep healthy? Present and explain what we know about the circulatory system, nutrients and keeping healthy.</p> <p>Digestion and circulation Remember circulation and digestion: how are these two systems connected?</p> <p>Removal of waste Where are the kidneys and what do they do?</p> <p>Keeping healthy</p>	<p>Cell Chamber System Circulation Vessel Clot Filter Expel Substance Function Regulate Transform</p>	<p>Plasma Platelet Artery Capillary Vein Ventricle Kidney Bladder Urine Excretion Toxin Nutrient</p>
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			How do kidneys keep us healthy?		
Year 6	Electricity Physics Matter Forces and motion Sound, light and waves Electricity and magnetism	Y1 Everyday materials (chem) Y2 Uses of everyday materials (chem) Y3 Light Y4 States of matter Y4 Sound Y4 Electricity Y5 Forces Y5 Earth in Space	Do-it What is electricity? How does it work? How do we build and represent a series circuit? What are the components in a series circuit? Test-it How does the number of cells and voltage affect components in a circuit? Diagnose-it What are the effects and consequences of changing circuit components and batteries?	Component Consequence Systematic Represent Source Generate	Proton Neutron Electron Terminal Series Voltage
Year 6	Evolution Biology The study of living things Change Evolution Adaption Environment	Y3 Plants Y4 Living things and their habitats Y5 Living things and their habitats Y6 Living things and their habitats	Change over time How have living things changed over time? How do we know? How has life evolved over time? Biological change What is DNA and what does it do? Are all offspring identical to their parents? Theories of evolution Darwin and Wallace – what	Characteristic Adaptation Acquire Theory Modify Generation	Evolve Survival Species Clone Inherit Fossil

			evidence did they share to argue the case for evolution? Survival of the fittest - how have animals adapted and evolved to suit their environment?		
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