



Our Lady of Lourdes Skills, Knowledge and Vocabulary Progression Map showing Interleaving – Science

For Curriculum Topic Information, please see the relevant Yearly Plan in our Reading Curriculum.

Curriculum Intent for Science

Live: At Our Lady of Lourdes we value, respect and understand the importance and impact of the **abundant connections** in our world. We aim to inspire **curiosity** through nurturing the use of the key skills: **observing, enquiring, investigating, recording and evaluating** - both in Science and our everyday lives.

Love: The Science curriculum is rooted in instilling a love of **exploring, understanding and investigating** the processes of **the natural and physical world**. We teach the children to take **accountability** for their choices by encouraging them to reflect on their **impact** on the environment and wider world. We make those choices by keeping “**love one another, as I have loved you**” at the forefront of our minds.

Learn: We learn to be **critical thinkers** with a joy and enthusiasm for **scientific knowledge and discovery**. We learn through **enquiry and investigation**, the effects of Science historically and what impact this has on today and our future. We learn to use Science **to improve and grow** our world in positive and sustainable ways for all living and non-living beings.

Greater Depth within the Science Curriculum

In order to enable opportunities for ‘Greater Depth’ we need to provide rich, purposeful learning which promotes relationships, curiosity, seeking meaning and enabling children to follow their passions.

We believe depth of learning can be achieved when:

- Children form a relationship with their learning.
- The learning has human significance so it’s relevant to the future decisions and the active contribution our children can make to the world; learning that teaches the children how to live and love, as well as, how to learn.
- Collaboration is at the heart of learning. Discussion, debate, respect, communication, creativity and critical thinking skills are all valuable currency in an increasing complex world.
- Deeper thinking and reflection are prominent to deeper learning. Teaching children how to reflect, explain, justify, question are key to lesson design.

Thinking and Working Scientifically at Our Lady of Lourdes

Thinking and Working Scientifically is at the heart of our curriculum and can be defined as “developing understanding and skills of scientific models and representations, scientific enquiry and practical work.” This a strand that underpins our spiral curriculum, revisiting and building on key skills starting in the EYFS, through to Year 6.

Thinking and Working Scientifically can be condensed into four key areas:

Models and representations	Scientific enquiry: purpose and planning	Carrying out scientific enquiry	Scientific enquiry: analysis, evaluations and conclusions
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To ensure that our curriculum inspires and develops the children’s ability to confidently work and think scientifically, the progression of skills has been mapped out:

EYFS – The EYFS skills are derived from the Early Learning Goals they are set to achieve, considering the importance of a holistic approach to developing learners that are full of curiosity, asking questions and exploring them in creative, knowledge-first ways.

Year 1 and 2 – The KS1 skills directly follow The National Curriculum, with the four key areas being broken down into accessible chunks. Children begin to build their substantive knowledge and are introduced to methods of using disciplinary knowledge.

Years 3 and 4 – The LKS2 skills build on the prior developed skills in KS1, children can begin to confidently make use of their substantive and disciplinary knowledge while accessing the curriculum.

Years 5 and 6 – The UKS2 focus is on consolidating our learner’s skills by further developing their identities as Scientific Thinkers, cultivating frequent opportunities for independence and critical thinking through the curriculum content.

Key definitions to consider:

Disciplinary knowledge: refers to what pupils learn about how to establish and refine scientific knowledge, for example by carrying out practical procedures. By identifying and sequencing this knowledge, it is possible to plan in the curriculum for how pupils will get better at working scientifically throughout their time at school.

Substantive knowledge: refers to the established knowledge produced by science, for example, the parts of a flower or the names of planets in our solar system. This is referred to as ‘scientific knowledge’ and ‘conceptual understanding’ in the national curriculum.

Working Scientifically – EYFS

	Growth	Animals	Materials	Insects	Living things and their habits
Choose the resources they need for their chosen activities and say when they do or don't need help.					
Know about similarities and differences in relation to places, objects, materials and living things.					
Make observations of animals and plants. Explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function.					
Select and use technology for specific purposes.					
Represent their own ideas, thoughts and feelings through design and technology, art, music, dance, role play and stories.					
Talk about the features of their own immediate environment and how environments might vary from one to another.					
Explain why some things occur and talk about changes.					

Working Scientifically – Year 1

	Exploring Everyday Materials 1	Seasonal Changes	Animals including Humans: All About Me	Animals including Humans: All About Animals	Plants	Exploring Everyday Materials 2
Asking simple questions and recognise that they can be answered in different ways						
Asking simple questions and recognise that they can be answered in different ways						
Perform simple tests						
Identify and classify						
Using their observations and ideas to suggest answers to questions						
Gather and record data to help in answering questions						

Working Scientifically – Year 2

	Use of everyday materials	Animals including humans 1 - Health & survival	Living things and their habitat 1	Plants	Living things and their habitat 2 – Habitats around the world	Animals, including humans 2 – Life cycles
Asking simple questions and recognise that they can be answered in different ways						
Asking simple questions and recognise that they can be answered in different ways						
Perform simple tests						
Identify and classify						
Using their observations and ideas to suggest answers to questions						
Gather and record data to help in answering questions						

Working Scientifically – Year 3

	Forces and Magnets	Rocks	Animals including humans	Light	Plants
Ask relevant questions and using different types of scientific enquiries to answer them					
Set up simple practical enquiries, comparative and fair tests					
Make systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers					
Gather, record, classify and present data in a variety of ways to help in answering questions					
Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables					
Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions					
Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions					
Identify differences, similarities or changes related to simple scientific ideas and processes					
Use straightforward scientific evidence to answer questions or to support their findings					

Working Scientifically – Year 4

	Electricity	States of Matter	Animals including humans	Sound	Living things and their habitats
Ask relevant questions and using different types of scientific enquiries to answer them					
Set up simple practical enquiries, comparative and fair tests					
Make systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers					
Gather, record, classify and present data in a variety of ways to help in answering questions					
Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables					
Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions					
Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions					
Identify differences, similarities or changes related to simple scientific ideas and processes					
Use straightforward scientific evidence to answer questions or to support their findings					

Working Scientifically – Year 5

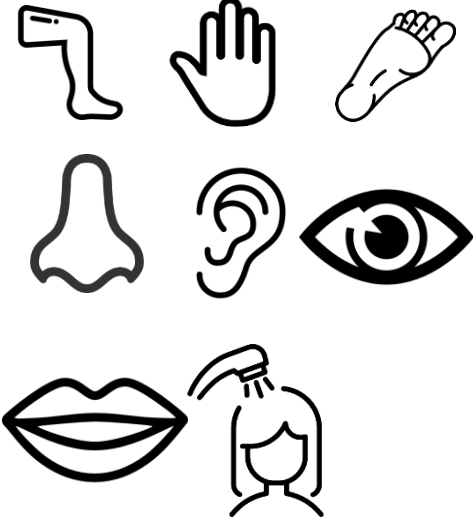
	Earth and Space	Changes of materials	Forces	Living things and their habitats.	Animals, including humans	Properties of materials
Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary						
Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate						
Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs						
Use test results to make predictions to set up further comparative and fair tests						
Report and present 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						
Identify scientific evidence that has been used to support or refute ideas or arguments						

Working Scientifically – Year 6

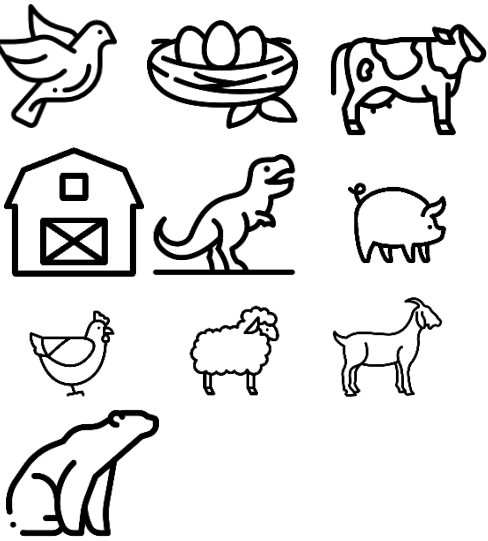

	Living things and their habitats.	Animals, including humans	Electricity	Evolution and inheritance	Light
Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary					
Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate					
Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs					
Use test results to make predictions to set up further comparative and fair tests					
Report and present 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					
Identify scientific evidence that has been used to support or refute ideas or arguments					

EYFS – Progression of knowledge

Autumn 2 – Growth

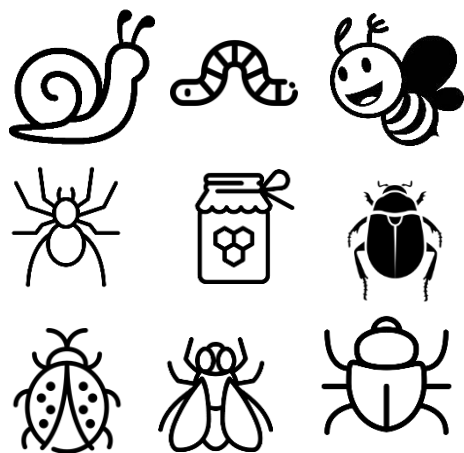
EYFS Early Learning Goals	Key Learning	Rocket Words Covered	Resources needed
<ul style="list-style-type: none"> Explore the natural world around them, making observations and drawing pictures of animals and plants; 		<p style="text-align: center;">arm leg nose hand foot ear eye mouth</p>	<ul style="list-style-type: none"> Presentations

Spring 1 – Animals

<ul style="list-style-type: none"> Explore the natural world around them, making observations and drawing pictures of animals and plants; 		bird cow sheep goat chicken pig farm bear	<ul style="list-style-type: none"> Presentations
Spring 2 – Living things and their habitats			
<ul style="list-style-type: none"> 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; 		melt wool mirror jumper cold freeze ice smooth	<ul style="list-style-type: none"> Presentations Jumpers Mirror

Summer 1 - Insects

- Explore the natural world around them, making observations and drawing pictures of animals and plants;



snail
worm
spider
honey
beetle
ladybird
fly
insect

- Presentations
- Caterpillars and butterfly enclosure

Summer 2 – Weather and Seasons

- 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;



rain
snow
winter
summer
spring
autumn
wind
sun

- Presentations

Year 1 – Progression of knowledge

Autumn 1 – Exploring Everyday Materials 1

National Curriculum References	Scientific Enquiry Covered	Rocket Words Covered		Resources needed
<ul style="list-style-type: none"> • Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water and rock • Distinguish between an object and the material it is made from • Describe the simple physical properties of a variety of everyday materials • Compare and group together a variety of everyday materials on the basis of their simple physical properties • Describe the simple physical properties of a variety of everyday materials 	<ul style="list-style-type: none"> • Identify and classify • Use observations and ideas to suggest answers to questions • Perform simple tests • Gather and record data to help in answering questions • Identify and classify • Perform simple tests 	material fabric wood plastic metal object glass property brick elastic property opaque transparent dull stiff	natural man-made factory rubber polyester predict float sink submerge buoyant absorbent sponge waterproof umbrella soak	<ul style="list-style-type: none"> • Squares of fabric, wood, plastic, metal and a bag. • Everyday objects from the classroom. • A selection of everyday objects that match the handout. • Scissors and a glue stick. • Bowls of water. A selection of objects to investigate. • Sponges, paper towels, paper, cloth, tin foil, cut up plastic bag, tray and water.

Autumn 1 – Seasonal Changes

<ul style="list-style-type: none"> • Observe changes across the four seasons • Observe and describe weather associated with the seasons and how day length varies 	<ul style="list-style-type: none"> • Using their observations and ideas to suggest answers to questions • Identifying and classifying • Performing simple tests • Gathering and recording data to help in answering questions 	<p>season spring summer autumn winter hibernate weather protect harvest frost sleet temperature</p>	<p>compare changes grow chick warm sun protection heatwave rainfall measuring record results graph</p>	<ul style="list-style-type: none"> • A large measuring bowl for collecting rainwater. Colouring and drawing resources. • A large measuring bowl for collecting rainwater. Colouring and drawing resources. • Rain gauges • Scissors and glue. • Drawing and colouring resources. • The rainwater collected over five weeks. Writing and colouring resources.
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Spring 1 – Animals including humans – All About Me

<ul style="list-style-type: none"> • Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense 	<ul style="list-style-type: none"> • Identify and classify • Perform simple tests • Gather and record data to help in answering questions • Use observations and ideas to suggest answers to questions 	<p>head body skeleton limb joint brain eyelash eye sight pupil sound mouth taste flavour sweet</p>	<p>ear sign language vibration deafness tongue touch fingertips skin organ brain smell odour nose</p>	<ul style="list-style-type: none"> • Pen, pencil, wallpaper, marker pens. • Drawing materials. • Pen, pencil, a range of instruments or different objects to create sounds. • Bread dipped or spread with a variety of different flavours for children to taste. You could use marmite, honey, jam, lemon juice, cream cheese, olive oil. You could also
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		hair	nostril	<p>include a variety of fruits and vegetables.</p> <ul style="list-style-type: none"> • Range of classroom objects. • A selection of containers suitable for putting food in. A range of food to smell; for instance, vinegar, garlic, cinnamon sticks, fruits, washing up liquid, liquid hand soap, cheese, crisps, chocolate and onion.
Spring 2 – Animals including Animals – All About Animals				
<ul style="list-style-type: none"> • Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals • Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets) • Identify and name a variety of common animals that are carnivores, herbivores and omnivores 	<ul style="list-style-type: none"> • Group and sort • Use observations and ideas to suggest answers to questions 	<p>fish amphibian reptile mammal bird feather warm-blooded characteristic backbone hatchling amphibian reptile gills scale cold-blooded</p>	<p>herbivore carnivore omnivore predator canines pet wild shelter veterinary natural similarities differences compare unsuitable climate</p>	<ul style="list-style-type: none"> • Scissors, glue, pen and pencil. • Handout to play the game. • Pen and pencil

Summer 1 - Plants

<ul style="list-style-type: none"> • Become familiar with common names of flowers and plant structures including seeds • Identify and describe the basic structure of a variety of common flowering plants, including trees • Identify and name a variety of common wild and garden plants • Identify and name a variety of deciduous and evergreen trees • Understand how plants change over time • Observe the growth of planted flowers • Keep records of how plants change over time 	<ul style="list-style-type: none"> • Ask simple questions • Observe closely and use simple equipment • Use their observations and ideas to suggest answers to questions • Identify and classify • Gather and record data 	<p>seed plant tree soil predict stem petal leaf root flower environment weed daisy dandelion wild deciduous evergreen seasons</p>	<p>branch bush supermarket fruit vegetable farm tractor growth seedling young plant adult plant observe</p>	<ul style="list-style-type: none"> • Variety of seeds, planting equipment: cups, soil, labels, water. Story of Jack and the Beanstalk. • 2 or 3 fully grown garden plants in pots. Paper and pens for drawing or coloured card, scissors and glue. • Clipboards and pens if going on a walk. Scissors and glue if sorting the pictures. • Crayons and paper for leaf rubbing; a selection of leaves for children to examine; microscopes or magnifying glasses. • A selection of fruits and vegetables and their seeds or stones. Tools for cutting. • The plants from Lesson 1. Ruler.
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Summer 2 – Exploring Everyday Materials 2 - Building

<ul style="list-style-type: none"> • Describe the simple physical properties of everyday materials • Compare and group together a variety of everyday materials on the 	<ul style="list-style-type: none"> • Perform simple tests • Use observations and ideas to suggest answers to questions • Identify and classify 	<p>solid strong brick clay wind</p>	<p>fabric furniture cotton mattress soft wool</p>	<ul style="list-style-type: none"> • Hairdryer/fan, a selection of materials for children to explore and select to build their house and adhesives. • A selection of materials for children to test if they are
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<p>basis of their simple physical properties</p>		<p>waterproof absorbent non-absorbent roof slate transparent opaque suitable window pane window frame</p>	<p>weather jumper suitable waterproof evaluate material properties tile garden</p>	<p>waterproof (as a class), a selection of materials for children to build their roofs, adhesives, a sponge and a small bowl of water.</p> <ul style="list-style-type: none"> • Clear plastic or acetate, card and sticky tape. • Pen and pencils, craft materials and fabrics. • Clothing. • Pen and pencil.
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Year 2 – Progression of knowledge

Autumn 1 – Use of everyday materials

National Curriculum References	Scientific Enquiry Covered	Rocket Words Covered		Resources needed
<ul style="list-style-type: none"> • Identify and compare the suitability of a variety of everyday materials • Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching • Identify and compare the suitability of a variety of everyday materials 	<ul style="list-style-type: none"> • Using their observations and ideas to suggest answers to questions • Performing simple tests • Gathering and recording data to help in answering questions 	material property suitable object brick bridge triangle obstacle structure construction stretchy elastic floppy hinder limit	bend twist squash stretch force mackintosh protective fluorescent safety waterproof John McAdam merchant bound highway road	<ul style="list-style-type: none"> • Objects from around the classroom. • Two books, a range of weights, variety of materials to create a bridge - aluminium foil, card, paper, wood, string, masking tape etc. • A variety of materials of different stretchiness (e.g. cotton, wool, nylon...), tape measure or ruler; scissors, marbles, yoghurt carton, string, paper clips. • A variety of materials which can be twisted, bent, squashed or stretched (e.g. plasticine, wool, foil...). • Four different sheets of fabric (tissue, tinfoil, clingfilm, plastic, wool fabric, nylon), beaker, elastic band, one tray per table, syringe per group, water.

				<ul style="list-style-type: none"> Chocolate, microwave, clingfilm, raisins, digestive biscuits crushed to various sizes, heatproof tray.
Autumn 2 – Animals including humans 1 – Health & Survival				
<ul style="list-style-type: none"> Find out about and describe the basic needs of animals, including humans, for survival (water, food and air) Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene 	<ul style="list-style-type: none"> Using their observations and ideas to suggest answers to questions Identifying and classifying Performing simple tests 	survival shelter nutrition oxygen essential vital non-essential survive grow healthy protein carbohydrate dairy vitamins calcium fat	balanced diet nutrients fresh food pre-cooked processed food exercise strength flexibility balance coordination hygiene prevent germs bacteria virus	<ul style="list-style-type: none"> Pen, pencil, glue, paper plates craft materials for making food, e.g. tissue paper, card, coloured paper, pipe cleaners, playdoh. Stopwatch, bean bags, small sized balls, medium sized balls, large balls. Shallow bowl or plate, water, pepper, dish soap.
Spring 1 – Living things and their habitats 1				
<ul style="list-style-type: none"> Explore and compare the differences between things that are living, dead, and things that have never been alive Identify and name a variety of plants and animals in their habitats, including microhabitats 	<ul style="list-style-type: none"> Identifying and classifying Observing closely, using simple equipment Using their observations and ideas to suggest answers to questions Asking simple questions and recognising that they 	senses nutrition reproduce excrete respire habitat microhabitat fungi survive shelter antennae suitable	producer consumer herbivore carnivore omnivore food chain life cycle nutrients rot caterpillar automated	<ul style="list-style-type: none"> Equipment for a classification walk: clipboards, pencils. Equipment for a nature hunt: clip boards, pencils. Photographs from the handout if not using the outdoors.

<ul style="list-style-type: none"> Describe how animals obtain their food from plants and other animals Describe how animals obtain their food from plants and other animals, using the idea of a simple food chain Identify and name different sources of food 	<p>can be answered in different ways</p> <ul style="list-style-type: none"> Gathering and recording data to help in answering questions 	<p>condition colony insect</p>	<p>frozen food forklift truck refrigerated lorry canned</p>	<ul style="list-style-type: none"> If creating a real microhabitat outdoors, a selection of natural materials for children to create a 'bug hotel', or modelling resources if creating a model microhabitat. Research tools, e.g. internet and books. Card/paper, scissors, sticky tape, coloured pens/pencils, glue stick. You may prefer to provide the learners with animal pictures to cut out instead.
Spring 2 – Plants				
<ul style="list-style-type: none"> Observe and describe how seeds and bulbs grow into mature plants Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy Understand the requirements of plants for germination, growth and survival, as well as, the processes of reproduction and growth in plants 	<ul style="list-style-type: none"> Identifying and classifying Observing closely, using simple equipment Asking simple questions and recognising that they can be answered in different way Performing simple tests Using their observations and ideas to suggest answers to questions Gathering and recording data to help in answering questions 	<p>seeds bulbs growth plant compare predict investigate control experiment method photosynthesis carbon dioxide oxygen glucose energy</p>	<p>pollination life cycle germination reproduction seedling manure crop insulate thrive healthy forest desert adapt condition survive</p>	<ul style="list-style-type: none"> Variety of seeds and bulbs, cutting equipment, tools for drawing or printing, a variety of liquids. Planting equipment, seeds and variables such as a freezer. A healthy plant and some tape. If necessary, pictures of plants at different stages of growth, coloured chalk.

Summer 1 – Living things and their habitats 2 – Habitats around the world

<ul style="list-style-type: none"> Identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other Identify and name a variety of plants and animals in their habitats, including microhabitats 	<ul style="list-style-type: none"> Identifying and classifying Using their observations and ideas to suggest answers to questions Gathering and recording data to help in answering questions Asking simple questions and recognising that they can be answered in different ways 	habitat microhabitat organism environment mate rainforest moisture extinct climate endangered biodiversity deforestation poaching pollution rainforest	plankton ocean ecosystem coral reef trench Antarctic Arctic caribou narwhal tundra earthworm desert lizard cactus pond	<ul style="list-style-type: none"> Glue, scissors. Clipboard, pen/pencil, *May require permissions if choosing to walk outside school premises Books/access to the internet for research, colouring pens/pencils, coloured paper, iPads to film videos (optional) Materials to create a collage, paper, paints, corrugated card, coloured card, glue, scissors, sticky tack, pens, pencils Shoebox/ or cardboard box, craft materials, toy animals
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Summer 2 - Animals including humans 2 – Life cycles

<ul style="list-style-type: none"> Notice that animals, including humans, have offspring which grow into adults 	<ul style="list-style-type: none"> Identifying and classifying Using their observations and ideas to suggest answers to questions Gathering and recording data to help in answering questions Asking simple questions and recognise that they can be answered in different ways 	life cycle grow survive independent adult foetus womb helpless toddler develop offspring	reproduction hatchling chick bar chart predict caterpillar transformation larva chrysalis metamorphosis frog	<ul style="list-style-type: none"> Pen, pencil, scissors, glue Chicks & data, if available. If you have not hatch chicks, use the handout for chick data, squared paper. Resources to enable the children to create a model of a butterflies life cycle; this may include plasticine, a selection of card or card board, tissue paper,
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		inherit gene resemble differences	amphibian frogspawn tadpole froglet	paints/colouring pens, scissors, glue, pipe cleaners.
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Year 3 – Progression of knowledge

Autumn 1 – Forces and Magnets

National Curriculum References	Scientific Enquiry Covered	Rocket Words Covered		Resources needed
<ul style="list-style-type: none"> • Notice that some forces need contact between 2 objects, but magnetic forces can act at a distance • Compare how things move on different surfaces • Describe magnets as having 2 poles Predict whether 2 magnets will attract or repel each other, depending on which poles are facing • Compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials • Describe magnets as having two pole 	<ul style="list-style-type: none"> • Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions • Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers • Setting up simple practical enquiries, comparative and fair tests • Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables 	force contact force non-contact forces air resistance friction motion surface resistance texture tilt magnet attract repel bar magnet horseshoe magnet	magnetism magnetic magnetic field iron steel non-contact forces magnetism attract non-magnetic materials recycle compass magnetic needle magnetic north direction orienteering	<ul style="list-style-type: none"> • A range of PE and playground equipment • A toy boat (or wooden block), thick books, a stopwatch, a cardboard/wooden ramp, a selection of materials e.g. bubble wrap, clingfilm, paper, felt and sandpaper (NB: any object can be timed moving down the ramp, but for a measurable effect, pick an object that slides - not rolls. Avoid toys with wheels or balls.) • Bar magnets and horseshoe magnets • A range of magnets and everyday classroom objects • 5 different types of magnet, paperclips, something to hold the magnet, a thin thread, tape and a ruler or tape measure

				<ul style="list-style-type: none"> Compasses, clipboards and writing tools
Autumn 2 - Rocks				
<ul style="list-style-type: none"> Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties Explore how and why [rocks] might have changed over time (non-statutory) Describe in simple terms how fossils are formed when things that have lived are trapped within rock Recognise that soils are made from rocks and organic matter 	<ul style="list-style-type: none"> Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers Identifying differences, similarities or changes related to simple scientific ideas and processes 	igneous rocks intrusive igneous rock extrusive igneous rock crystals magma sedimentary rock metamorphic rock limestone marble sandstone weathering chemical weathering physical weathering biological weathering acid rain	appearance texture submerged erosion receding fossil extinct sediment embedded amber decompose fragments clay soil chalky soil sandy soil	<ul style="list-style-type: none"> Chocolate chips, coconut oil, ice cubes, cooking equipment (including a microwave or hob), caster sugar, golden syrup, bicarbonate of soda, a wooden spoon and a food container A selection of rocks to test, sandpaper, nails, small wooden spoons, water, pipettes, a bowl of water and a microscope or magnifying glass Vinegar, a pipette, a selection of different rocks and colouring pencils A variety of different rocks, bowls of water, weighing scales and a timer Salt, flour, coffee grounds, cold coffee or water, a mixing bowl, a mixing spoon and objects to create imprints

				<ul style="list-style-type: none"> • Samples of different soils (for instance, peat soil, clay soil, sandy soil, silt soil, loam soil or chalky soil), beakers, a measuring cylinder, filter paper, a funnel, a teaspoon, a magnifying glass and pipettes
Spring 1 – Animals including humans				
<ul style="list-style-type: none"> • Identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat • Identify that humans and some other animals have skeletons and muscles for support, protection and movement 	<ul style="list-style-type: none"> • Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions • Using straightforward scientific evidence to answer questions or to support their findings • Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions • Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts and tables • Identifying differences, similarities or changes 	<ul style="list-style-type: none"> • nutrition • carbohydrate • protein • vitamin • mineral • nutrition • label • portion • energy • balanced diet • vertebrate • invertebrate • endoskeleton • exoskeleton • hydrostatic • skeleton 	<ul style="list-style-type: none"> • humerus • ulna • radius • tibia • fibular • endoskeleton • vertebrate • skull • rib cage • spine • muscle • contract • hamstrings • biceps • diaphragm 	<ul style="list-style-type: none"> • A selection of food for the class to sort into the 5 key food groups • A range of food products containing nutrition labels • Scissors and glue (optional), research resources: books or interne • Split pins

	related to simple scientific ideas and processes			
Spring 2 - Light				
<ul style="list-style-type: none"> Recognise that they need light in order to see things and that dark is the absence of light Recognise that light from the sun can be dangerous and that there are ways to protect their eyes Notice that light is reflected from surfaces Recognise that shadows are formed when the light from a light source is blocked by an opaque object Find patterns in the way that the size of shadows change 	<ul style="list-style-type: none"> Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions Identifying differences, similarities or changes related to simple scientific ideas and processes 	light source natural artificial reflect vitamin D ultraviolet rays sunburn exposure protection fluorescent high visibility reflective surface materials	shadow opaque sundial rays blocks position cast opposite direction length size shape closer further puppet	<ul style="list-style-type: none"> Glue and scissors UV beads, a range of sun creams with at least 3 different SPF values, black paper, sticky tack and a plat Torches and a range of materials to investigate, such as tin foil, paper, wood, metal and fabric Torch, opaque objects (enough for each child to have one), pencils and paper Data from the shadow stick investigation, ruler and graph paper Shadow puppet stage, lighting and handout with puppet silhouettes
Summer 1 - Plants				
<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> Asking relevant questions and using different types of scientific enquiries to answer them Setting up simple practical enquiries, comparative and fair tests 	nutrients fertiliser nursery potassium stunted chlorophyl stomata	anther stigma style filament reproduction pollination pollen	<ul style="list-style-type: none"> Planting equipment, seeds Onions and a glass of water Celery in dyed water (prepared 2 days before), cut flowers, water and dye

<ul style="list-style-type: none"> • Identify and describe the functions of different parts of a flowering plant • Investigate the way in which water is transported within plants • Explore the part that flowers play in the life cycle of flowering plants, including p 	<ul style="list-style-type: none"> • Making systematic and careful observations • Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions • Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions • Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions 	<p>xylem photosynthesis UV light xylem phloem absorb stomata transpiration</p>	<p>nectar seed dispersal pollinator germination vulnerable anchor sapling formation</p>	<ul style="list-style-type: none"> • Plasticine and a white board • Equipment so pupils can create a class display • Plants from the experiment
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Year 4 – Progression of knowledge

Autumn 1 – Electricity

National Curriculum References	Scientific Enquiry Covered	Rocket Words Covered		Resources needed
<ul style="list-style-type: none"> • Identify common appliances that run on electricity • 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 • Recognise some common conductors and insulators, and associate metals with being good conductors • Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit 	<ul style="list-style-type: none"> • Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions • Using straightforward scientific evidence to answer questions or to support their findings • Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions • Setting up simple practical enquiries, comparative and fair tests • Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers 	electricity batteries mains electricity appliance socket circuit series circuit component cell voltage current power battery wire bulb	conductor insulator metal copper rubber switch current control complete circuit incomplete circuit non-renewable energy renewable energy wind turbines solar panels hydropower	<ul style="list-style-type: none"> • Pen, pencils and colouring equipment • PhET slide, batteries, bulb, alligator clips, buzzers, bell, switch and wires • A variety of materials and objects that can be investigated, such as tin foil, fabric, a coin, a rubber, paper, wood and classroom objects that could have both a part that is a conductor and a part that is an insulator • A variety of materials that can be used as a switch such as paper clips, tin foil, pins, safety pins and coins. Include some resources for the children to stick or pin their switches to, such as card or cardboard

	<ul style="list-style-type: none"> • Ask relevant questions and using difference types of scientific enquiries to answer them 			
Autumn 2 – States of Matter				
<ul style="list-style-type: none"> • Compare and group materials together, according to whether they are solids, liquids or gases • 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) • Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature 	<ul style="list-style-type: none"> • Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions • Using straightforward scientific evidence to answer questions or to support their findings • Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers • Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables • Using results to draw simple conclusions, make predictions for new values, 	<p>matter solid liquid gas volume particle bond arranged cooled heated particle melting melting point temperature thermometer</p>	<p>freezing reverse boiling sublimation deposition evaporation condensation absorb water vapour process water cycle precipitation surface runoff transpiration groundwater</p>	<ul style="list-style-type: none"> • Examples of the 3 states of matter, scissors, glue and pencils • Ruler, pencil, water, an ice tray, a freezer, a kettle/stove and a thermometer/temperature probe • Mini whiteboards, variety of foods to melt (such as butter, coconut oil, dark, milk and white chocolate, gummy bear, different cheeses), tealight stand, tealight, metal pie cases, tongs, matches, or access to a kitchen stove with a saucepan and bowl over boiling water, thermometer • Computers/tablets, squared paper, coloured pencils, ruler, pencil • Cups or beakers, water, measuring cylinders, graph paper, ruler, pencil

	suggest improvements and raise further questions			
Spring 1 – Animals including humans				
<ul style="list-style-type: none"> 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 Construct and interpret a variety of food chains, identifying producers, predators and prey 	<ul style="list-style-type: none"> Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables Making systematic and careful observations Reporting on findings from enquiries, including oral and written explanations Setting up simple practical enquiries, comparative and fair tests Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions 	digestive system oesophagus stomach small intestine large intestine saliva peristalsis absorb liver gall bladder incisors canines molars jaw gum	enamel plaque tooth decay cavity fluoride ecosystem producer consumer prey predator food web tundra hide interdependence threatened	<ul style="list-style-type: none"> Glue, scissors, handout, pen and pencils, craft materials and whiteboards A digestive system model A mirror Beverages: sugary - soda, energy drink (e.g. Red Bull), sports drink (Gatorade), juice; acidic - vinegar, orange juice, water (control), milk (control), clear cups or glasses (one for each drink) with covers or pieces of foil or plastic wrap and rubber bands to cover, eggs, an extra toothbrush and toothpaste Coloured card, string Books and access to the internet
Spring 2 - Sound				
<ul style="list-style-type: none"> Identify how sounds are made, associating some of them with something vibrating 	<ul style="list-style-type: none"> Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusion 	vibration medium waves eardrum signals source	volume decibels decibel metre amplitude power pitch	<ul style="list-style-type: none"> Resources for children to create their presentations, either on paper or digitally Sugar grains, cling film, bowl, speaker string, wire coat hanger, tank of water,

<ul style="list-style-type: none"> • Recognise that vibrations from sounds travel through a medium to the ear • Find patterns between the volume of a sound and the strength of the vibrations that produced it • Find patterns between the pitch of a sound and features of the object that produced it • Recognise that sounds get fainter as the distance from the sound source increases 	<ul style="list-style-type: none"> • Identifying differences, similarities or changes related to simple scientific ideas and processes • Setting up simple practical enquiries, comparative and fair tests • Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers • Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables 	<p>energy particles echo vacuum materials reflect absorb insulate defenders</p>	<p>high pitch low pitch instruments orchestra energy particles travel sound source fade</p>	<p>two rocks, 2l plastic bottle (bottom cut off) and an inflated balloon</p> <ul style="list-style-type: none"> • Card, sticky tape and a range of resources to explore, such as foil, cotton wool, bubble wrap, fabric, scrap paper or shredded newspaper and foam • A range of weights, a ruler, a decibel metre (you can download an app via a phone or tablet), pencils, graph paper and a drum • Resources for making musical instruments, such as boxes, kitchen rolls, elastic bands of different thickness, a selection of storage boxes, rice, lentils or beans, card, scissors, glue, tape, string, glass tubes/bottles or drinking glasses of different sizes, spoons and pencils • Music through a speaker, tape measure, a decibel metre (you can download an app via a phone or tablet), pencils and graph paper
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Summer 1 – Living things and their habitats

<ul style="list-style-type: none"> • Recognise that living things can be grouped in a variety of ways • Making a guide to local living things (nonstatutory) • Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment 	<ul style="list-style-type: none"> • Identifying differences, similarities or changes related to simple scientific ideas and processes • Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions • Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions • Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables 	<p>habitat microhabitat conditions adapted camouflage coastal grassland environment climate exposure classify characteristics vertebrate invertebrate species</p>	<p>sub-groups identify criteria classification keys organism adapted region features colouring blubber ecosystem oxygenised flowering plant non-flowering plant pond dipping</p>	<ul style="list-style-type: none"> • Colouring pencils • For pond dipping (optional): a clear container/viewing trays/bucket, teaspoons, nets, magnifying glasses and clip boards
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Year 5 – Progression of knowledge

Autumn 1 – Earth and Space

National Curriculum References	Scientific Enquiry Covered	Rocket Words Covered		Resources needed
<ul style="list-style-type: none"> • Describe the Sun, Earth and Moon as approximately spherical bodies • Describe the movement of the Earth and other planets relative to the Sun in the solar system • Use the idea of the Earth's rotation to explain day and night and the apparent movement of the Sun across the sky • Describe the movement of the Moon relative to the Earth 	<ul style="list-style-type: none"> • Identifying scientific evidence that has been used to support or refute ideas or arguments • Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate • Reporting and presenting findings from enquiries - including conclusions, causal relationships and explanations of and a degree of trust in results - in oral and written forms such as displays and other presentations • Using test results to make predictions to set up further comparative and fair tests 	terrestrial planet gas giant planets Solar System spherical orbit astronomy heliocentric geocentric dwarf planet axis poles season hemisphere	sundial time zone gnomon dial shadow moon phase waxing waning eclipse rocky planet moon	<ul style="list-style-type: none"> • 9 balls (one for the Sun) and a measuring trundle • Pictures of each planet (from last lesson), newspaper, 9 balloons/balls, oil, PVA glue, a bowl, water, paint, paintbrushes and string • A torch, a globe, playdoh and kebab skewers or cocktail sticks • Compass, glue, long wooden kebab skewers and time zone data • Pinwheel outlines, scissors, split pins, a globe, golf balls and a torch

Autumn 2 – Changes of materials

<ul style="list-style-type: none"> • Describe how to recover a substance from a solution • Demonstrate that dissolving, mixing and changes of state are reversible changes • Explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible including changes associated with burning and including changes associated the action of acid on bicarbonate of soda 	<ul style="list-style-type: none"> • Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations • Planning different types of scientific enquiry to answer questions, including recognising and controlling variables where necessary • Identifying scientific evidence that has been used to support or refute ideas or arguments • Using test results to make predictions to set up further comparative and fair tests 	<p>pure substance solute solvent solution evaporate reversible mixture physical change melting irreversible chemical change compare effervescence product</p>	<p>fair test variable control variable corrosion rusting combustion fuel oxygen extinguish smother reaction predict acid bicarbonate of soda carbon dioxide</p>	<ul style="list-style-type: none"> • 1 large clear bottle filled with pure water labelled “A”, 1 large clear bottle filled with salt water labelled “B” (30g of table salt in 150 ml of water), teaspoons, small containers such as foil cake cases to place liquid in, labels, access to an oven (200 oC for 20 minutes will evaporate 3 teaspoons of water and leave salt) or warm place. • Some chocolate that has been melted into a different shape, small toys frozen in some ice, sugar dissolved in water in a bottle, rice and sugar mixed together in a jar. Optional- to reverse changes: heat source and mould to re- melt chocolate and ice and evaporate water, sieve • Water, fizzing tablet (such as berroca or alka seltzer), vinegar, bicarbonate of soda, candle, matches, red cabbage indicator*,
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				<p>soapy water, water, milk, small bottles for liquids, small containers (small aluminium pie cases work well)</p> <ul style="list-style-type: none"> • Small iron nails, test tubes or other small containers, water, salty water, other liquids (lemon juice, cola etc) oil, paint or petroleum jelly • Tea light, matches, beaker, vinegar, bicarbonate of soda • Bicarbonate of soda, container with lid such as plastic egg or film canister, small containers to test substances in (test tubes or small foil containers), liquids (water, vinegar, cola, lemon juice), plastic spoons, pipettes
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Spring 1 - Forces

<ul style="list-style-type: none"> • Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object • Identify the effects of air resistance, water 	<ul style="list-style-type: none"> • Identifying scientific evidence that has been used to support or refute ideas or arguments • Taking measurements, using a range of scientific equipment, with increasing accuracy and 	<p>Sir Isaac Newton gravity astronomy weight mass Galileo Galilei air</p>	<p>friction resistance lubricant Newton meter Newton lever load pivot fulcrum pulley mechanism gear</p>	<ul style="list-style-type: none"> • 1m ruler/tape measure, weighing scales, variety of balls (tennis ball, soft ball, marble, hockey ball etc), pencil, 2 sheets of paper, stopwatch • feather, tennis ball, small plastic toys/weights,
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<p>resistance and friction, that act between moving surfaces</p> <ul style="list-style-type: none"> Recognise that some mechanisms including levers, pulleys and gears allow a smaller force to have a greater effect 	<p>precision, taking repeat readings when appropriate</p> <ul style="list-style-type: none"> Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary 	<p>resistance opposing streamlined parachute water resistance streamlined upthrust buoyant sink</p>	<p>mesh rack and pinion bevel</p>	<p>stopwatches, variety of materials to test (different types of papers, plastic bags, bin bags, variety of materials), rulers, hole punch, string, calculators</p> <ul style="list-style-type: none"> small object (such as a marble, or penny), large clear container filled with water, mini whiteboard, modelling clay, water, variety of containers (such as large bottles with the tops cut off, or large measuring cylinders), weighing scales a variety of surfaces (different carpets or carpet tiles, variety of wooden floors, tarmac/playground surface), trainer, Newton meter, ruler, weight Alternatively, children could cover a plank of wood with different surfaces (such as sandpaper, a towel, tinfoil, lino, carpet, corrugated cardboard, bubble wrap etc.), squared paper mini whiteboards, ball, a load to lift per child
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				<p>(weights/1 pint milk bottle/bag of sand etc.), materials to create a pulley - string, cotton reels, dowel, wheels, cardboard</p> <ul style="list-style-type: none"> • strong cardboard, lolly sticks, paper straws, sticky tape, thin dowel/cocktail sticks, plasticine, sticky tape, glue, compass, scissors
Spring 2 – Living things and their habitats				
<ul style="list-style-type: none"> • Describe the life process of reproduction in some plants and animals • Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird 	<ul style="list-style-type: none"> • Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary • Reporting and presenting findings from enquiries - including conclusions, causal relationships and explanations of and a 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 	<p>reproduction asexual fertilisation tuber genes pouch mammary glands placental mammal monotreme mammal marsupial metamorphosis caterpillar amphibian larva pupa</p>	<p>egg fledgling egg tooth hatch embryo documentary naturalist primatologist endangered natural sciences living organism reproduction life cycle vertebrate warm-blooded</p>	<ul style="list-style-type: none"> • Rooting powder, pots, a healthy plant (strawberry, tomato, basil or chilli) and soil • Mammal types sorting cards • Split pins • Eggs and toothpicks

Summer 1 - Animals including humans

<ul style="list-style-type: none"> Describe the changes as humans develop to old age 	<ul style="list-style-type: none"> Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate Identifying scientific evidence that has been used to support or refute ideas or arguments 	<p>foetus dependent adolescent puberty reproduce gestation pregnant duration extreme breeding womb umbilical chord embryo trimester midwife</p>	<p>growth spurt childhood motor skills milk teeth constant adolescence puberty hormones mood swing develop lifestyle keratin elasticity cataracts neurodegenerative</p>	<ul style="list-style-type: none"> Handouts and classroom materials.
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Summer 2 – Properties of materials

<ul style="list-style-type: none"> Compare and group together everyday 	<ul style="list-style-type: none"> Planning different types of scientific enquiries to 	<p>conductive magnetic</p>	<p>dissolve solute insoluble soluble</p>	<ul style="list-style-type: none"> 10 sample pieces of material - wood, paper,
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<p>materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets</p> <ul style="list-style-type: none"> • Compare and group together everyday materials based on evidence from comparative and fair tests, including their conductivity of heat • Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic • Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution • Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating 	<p>answer questions, including recognising and controlling variables where necessary</p> <ul style="list-style-type: none"> • Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate • Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs • Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations • Using test results to make predictions to set up further comparative and fair tests 	<p>durable transparent versatile thermal conduction molecules degrees Celsius (°C) insulator hardness force iron steel stone</p>	<p>solvent substance saturation pure substance mixture filtering sieving evaporation</p>	<p>card, plastic, string, wool, rubber, different metals, clay, pen and pencils, electrical equipment to make circuits (with a bulb), magnets, torch</p> <ul style="list-style-type: none"> • paper cups, a variety of materials to wrap up the cup, for instance, cling film, foil, paper, felt, cotton, sticky tape, thermometer, warm water, stopwatch • granite tile, ceramic tile, hardwood, softwood, slate, different stones, plastic, metal, card, coin and nail • a range of substances to test if they dissolve, for instance, sand, sugar, salt, flour, wax candles, coffee, jam, butter, chalk, jelly, pepper, measuring spoon, beakers/cup, water • a variety of solutes (salt, sugar, jelly, coffee), beakers, water • sand, sawdust, gravel, metal nuts, marbles, flour, beakers or containers,
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				filter paper, sieve, colander, magnets
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Year 6 – Progression of knowledge

Autumn 1 – Living things and their habitats

National Curriculum References	Scientific Enquiry Covered	Rocket Words Covered		Resources needed
<ul style="list-style-type: none"> • Give reasons for classifying plants and animals based on specific characteristics • Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants and animals 	<ul style="list-style-type: none"> • Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs and bar and line graphs • Identifying scientific evidence that has been used to support or refute ideas or arguments • Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary • Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate • Reporting and presenting findings from enquiries - including conclusions, causal relationships and 	classify microorganism fern living organism conifer kingdom mrs gren cell multicellular unicellular Carl Linnaeus classification Latin species domain	bacteria fungi virus protozoa plant microscopic fungi mycelium ecosystem habitat reproduction	<ul style="list-style-type: none"> • Liquorice allsorts, A3 paper • A plant and research materials • Mould growing investigation, slices of bread, sealable sandwich bags, water, sticky labels and marker pens • Large mushrooms, clamp stands, clamps, string, cocktail stick to make a hole, plain paper, hairspray and a rule

	explanations of and a degree of trust in results - in oral and written forms such as displays and other presentations			
Autumn 2 – Animals including humans				
<ul style="list-style-type: none"> Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood Describe the ways in which nutrients and water are transported within animals, including humans Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function 	<ul style="list-style-type: none"> Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate Identifying scientific evidence that has been used to support or refute ideas or arguments Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary Reporting and presenting findings from enquiries, including conclusions, causal relationships and 	circulatory system atrium ventricle vessel valves artery vein capillary microscope blood plasma platelet white blood cell red blood cell	absorb diffusion osmosis concentration nutrients diet exercise heart rate BPM pulse drug painkiller stimulant depressant hallucinogens	<ul style="list-style-type: none"> Pipe cleaners, plasticine, craft materials, colouring pencils, mini whiteboards, pen, pencil Water (with dye), disposable paper cups, modelling clay, nail/cocktail stick, pen, pencil, stopwatch Demonstration: 2 eggs, water, sugar, 2 glasses, gummy bears, different liquids (milk, cola/soda, distilled water, sugar, salt), beakers/cups/test tubes, pen, pencil, ruler Timers/stopwatches, heart rate monitors (if possible), PE equipment and attire, foods chosen by children

	explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations			
Spring 1 - Electricity				
<ul style="list-style-type: none"> • Use recognised symbols when representing a simple circuit in a diagram • Associate the brightness of a bulb or the volume of a buzzer with the number and voltage of cells used in the circuit • Compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches 	<ul style="list-style-type: none"> • Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs • Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary • Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations • Using test results to make predictions to set up further comparative and fair tests • Taking measurements, using a range of scientific 	<ul style="list-style-type: none"> symbol circuit circuit diagram battery wires electricity current voltage voltmeter brightness blown resistor variable resistor LED dimmer switch 	<ul style="list-style-type: none"> output variable fair test control test systematically synchronised traffic light signal sensor timer-based closed electric circuit indicating conductor insulator resistor 	<ul style="list-style-type: none"> • Series circuit equipment - including cells and voltmeters, high voltage bulbs, batteries and wires, pen, pencil, ruler • Laptops/iPads with circuit builder, (alternatively electrical components - wires, batteries, bulbs, resistors, voltage meter etc), pens, pencil, ruler • For each set of traffic lights: stiff card, wires and crocodile clips, 1.5V LEDs (green, red and yellow) - caution as higher voltages may break the LEDs, 2x 1.5V batteries, paperclips, tin foil, drawing pins, split pins, pen, pencil, ruler • Example electric circuit games, 1 thick corrugated cardboard base approximately 25 cm x 25 cm (to be prepared in advance), pencil, battery

	equipment, with increasing accuracy and precision, taking repeat readings when appropriate			holder and cells (Ideally zinc chloride), switch, bulb holder & bulb rated for the same voltage as the battery, 2x resistor, buzzer rated for the same voltage as the battery, 6 crocodile leads, wire for the loop, conductive metal for the loop, Insulating material for handle, timer/stopwatch
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Spring 2 – Evolution and Inheritance

<ul style="list-style-type: none"> 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 Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago 	<ul style="list-style-type: none"> Reporting and presenting findings from enquiries - including conclusions, causal relationships and explanations of and a 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 	offspring characteristic inherit variation environmental adaptation habitat climate nutrition feature nutrients epiphytes toxic predators pollinate	fossil Mary Anning Palaeontologist ichthyosaurus Jurassic coast Charles Darwin evolved extinct natural selection theory ancestor tools primate Homosapien Neanderthal	<ul style="list-style-type: none"> Handouts and classroom materials
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Summer 1 - Light

<ul style="list-style-type: none"> • 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 • 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 	<ul style="list-style-type: none"> • Record data and results of increasing complexity using scientific diagrams and labels • Identifying scientific evidence that has been used to support or refute ideas or arguments • Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary • Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs • Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations 	<p>light eye light source symbol scientific diagram reflected prediction fair test variable table periscope angle mirror line of sight utilise</p>	<p>shadow block opaque transparent translucent plan sun shade real life problem rotate direction optical phenomena disperse spectrum refraction</p>	<ul style="list-style-type: none"> • Torch, cardboard tube/a section of hosepipe/paper, card, hole punch, pen, pencil • Torch, cereal box, mirrors, scissors, sticky tape, ruler, pencil • Multilink • Modelling clay, torch, cocktail sticks, materials for making a screen, pen, pencil, ruler • Water, washing up liquid, straw, glass container, salt, bowl, paper, red, green and blue pens, coloured filters, penci
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|--|---|--|--|--|
| | <ul style="list-style-type: none">• Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary | | | |
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