



# Belton Primary School Science Curriculum Map

With NC links and Scientific  
Enquiry links

Taken from Developing Experts – updated August 2023



## EYFS

Science at Foundation Stage is covered in the 'Understanding the World' area of the EYFS Curriculum. It is introduced indirectly through activities that encourage every child to explore, problem solve, observe, predict, think, make decisions and talk about the world around them.

During their first years at school our children will explore creatures, people, plants and objects in their natural environments. They will observe and manipulate objects and materials to identify differences and similarities. They will also learn to use their senses, feeling dough or listening to sounds in the environment, such as sirens or farm animals. They will make observations of animals and plants and explain why some things occur and talk about changes. Children will be encouraged to ask questions about why things happen and how things work. They might do activities such as increasing the incline of a slope to observe how fast a vehicle travels, or opening a mechanical toy to see how it works. Children will also be asked questions about what they think will happen to help them communicate, plan, investigate, record and evaluate findings.

Reception	Communication and Language	<ul style="list-style-type: none"><li>• Learn new vocabulary.</li><li>• Ask questions to find out more and to check what has been said to them.</li><li>• Articulate their ideas and thoughts in well-formed sentences.</li><li>• Describe events in some detail.</li><li>• Use talk to help work out problems and organise thinking and activities, and to explain how things work and why they might happen.</li><li>• Use new vocabulary in different contexts.</li></ul>
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Reception Continued	Personal, Social and Emotional Development		<ul style="list-style-type: none"> <li>• Know and talk about the different factors that support their overall health and wellbeing:               <ul style="list-style-type: none"> <li>- regular physical activity</li> <li>- healthy eating</li> <li>- toothbrushing</li> <li>- sensible amounts of 'screen time'</li> <li>- having a good sleep routine</li> <li>- being a safe pedestrian</li> </ul> </li> </ul>
	Understanding the World		<ul style="list-style-type: none"> <li>• Explore the natural world around them.</li> <li>• Describe what they see, hear and feel while they are outside.</li> <li>• Recognise some environments that are different to the one in which they live.</li> <li>• Understand the effect of changing seasons on the natural world around them.</li> </ul>
ELG	Communication and Language	Listening, Attention and Understanding	<ul style="list-style-type: none"> <li>• Make comments about what they have heard and ask questions to clarify their understanding.</li> </ul>
	Personal, Social and Emotional Development	Managing Self	<ul style="list-style-type: none"> <li>• Manage their own basic hygiene and personal needs, including dressing, going to the toilet and understanding the importance of healthy food choices.</li> </ul>
	Understanding the World	The Natural World	<ul style="list-style-type: none"> <li>• Explore the natural world around them, making observations and drawing pictures of animals and plants.</li> <li>• 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.</li> <li>• Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.</li> </ul>

## Key stage 1 Science

- The principal focus of science teaching in key stage 1 is to enable pupils to experience and observe phenomena, looking more closely at the natural and humanly constructed world around them. They should be encouraged to be curious and ask questions about what they notice. They should be helped to develop their understanding of scientific ideas by using different types of scientific enquiry to answer their own questions, including observing changes over a period of time, noticing patterns, grouping and classifying things, carrying out simple comparative tests, and finding things out using secondary sources of information. They should begin to use simple scientific language to talk about what they have found out and communicate their ideas to a range of audiences in a variety of ways. Most of the learning about science should be done through the use of first-hand practical experiences, but there should also be some use of appropriate secondary sources, such as books, photographs and videos.
- 'Working scientifically' is described separately in the programme of study, but must always be taught through and clearly related to the teaching of substantive science content in the programme of study. Throughout the notes and guidance, examples show how scientific methods and skills might be linked to specific elements of the content.
- Pupils should read and spell scientific vocabulary at a level consistent with their increasing word-reading and spelling knowledge at key stage 1



## Key Stage 1 National Curriculum Working Scientifically

During years 1 and 2, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:

- asking simple questions and recognising that they can be answered in different ways;
- observing closely, using simple equipment;
- performing simple tests;
- identifying and classifying;
- using their observations and ideas to suggest answers to questions;
- gathering and recording data to help in answering questions.

Pupils in years 1 and 2 should explore the world around them and raise their own questions. They should experience different types of scientific enquiries, including practical activities, and begin to recognise ways in which they might answer scientific questions.

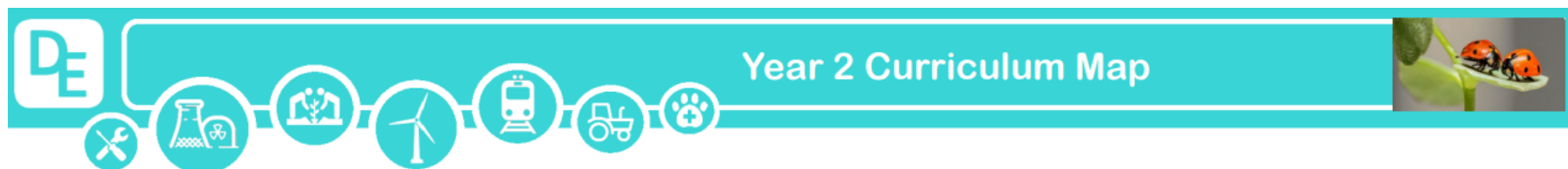
They should use simple features to compare objects, materials and living things and, with help, decide how to sort and group them, observe changes over time, and, with guidance, they should begin to notice patterns and relationships.

They should ask people questions and use simple secondary sources to find answers.

They should use simple measurements and equipment (for example, hand lenses, egg timers) to gather data, carry out simple tests, record simple data, and talk about what they have found out and how they found it out. With help, they should record and communicate their findings in a range of ways and begin to use simple scientific language.

These opportunities for working scientifically should be provided across years 1 and 2 so that the expectations in the programme of study can be met by the end of year 2. Pupils are not expected to cover each aspect for every area of study.

Cycle A



Year 2 - Animals, including humans 1 - Health & survival				
Lesson Intention	National Curriculum Reference	Scientific Enquiry Covered	Rocket Words Covered	Resources Needed
Describe the needs of animals for survival	Find out about and describe the basic needs of animals, including humans, for survival (water, food and air)	Using their observations and ideas to suggest answers to questions	survival shelter nutrition oxygen essential	Class presentation, pen, pencil.
Describe the needs of humans, for survival	Find out about and describe the basic needs of animals, including humans, for survival (water, food and air)	Using their observations and ideas to suggest answers to questions	vital non-essential survive grow healthy	Class presentation, pen, pencil, scissors, glue.
Explore the importance of eating the right food	Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene	Identifying and classifying	protein carbohydrate dairy vitamins calcium fat	Class presentation, pen, pencil, glue.
Describe what a healthy, balanced diet looks like	Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene	Using their observations and ideas to suggest answers to questions	balanced diet nutrients fresh food pre-cooked processed food	Class presentation, pen, pencil, glue, paper plates craft materials for making food, e.g. tissue paper, card, coloured paper, pipe cleaners, playdoh.
Investigate the impact of exercise on our bodies	Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene	Performing simple tests  Using their observations and ideas to suggest answers to questions	exercise strength flexibility balance coordination	Class presentation, pen, pencil, stopwatch, bean bags, small sized balls, medium sized balls, large balls.
Investigate the importance of hygiene	Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene	Performing simple tests	hygiene prevent germs bacteria virus	Class presentation, pen, pencil, shallow bowl or plate, water, pepper, dish soap.



## Year 1 Resource List



Year 1 - Everyday Materials - Exploring Everyday Materials Unit				
Lesson Intention	National Curriculum Reference	Scientific Enquiry Covered	Rocket Words Covered	Resources Needed
Identify and name a variety of everyday materials	Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water and rock	Identify and classify	material fabric wood plastic metal	Squares of fabric, wood, plastic, metal and a bag.
Distinguish between an object and the material it is made from	Distinguish between an object and the material it is made from	Use observations and ideas to suggest answers to questions	object glass property brick elastic	Everyday objects from the classroom.
Describe the properties of everyday materials	Describe the simple physical properties of a variety of everyday materials	Perform simple tests  Gather and record data to help in answering questions	property opaque transparent dull stiff	A selection of everyday objects that match the handout.
Identify objects that are natural and those that are manmade	Compare and group together a variety of everyday materials on the basis of their simple physical properties	Identify and classify	natural man made factory rubber polyester	Scissors and a glue stick.
Predict and identify if an object will float or sink	Compare and group together a variety of everyday materials on the basis of their simple physical properties	Perform simple tests	predict float sink submerge buoyant	Bowls of water. A selection of objects to investigate.
Explore which materials are best for different objects	Describe the simple physical properties of a variety of everyday materials	Perform simple tests Identify and classify Use observations and ideas to suggest answers to questions Gather and record data to help in answering questions	absorbent sponge waterproof umbrella soak	Sponges, paper towels, paper, cloth, tin foil, cut up plastic bag, tray and water.



## Year 1 Resource List



Year 1 - Everyday Materials - Building Unit based on the Three Little Pigs.				
Lesson Intention	National Curriculum Reference	Scientific Enquiry Covered	Rocket Words Covered	Resources Needed
Build a structure strong enough to withstand wind	Describe the simple physical properties of everyday materials	Perform simple tests	solid strong brick clay wind	Hairdryer/fan, a selection of materials for children to explore and select to build their house and adhesives.
Build a waterproof structure	Compare and group together a variety of everyday materials on the basis of their simple physical properties	Perform simple tests	waterproof absorbent non-absorbent roof slate	A selection of materials for children to test if they are waterproof (as a class), a selection of materials for children to build their roofs, adhesives, a sponge and a small bowl of water.
Understand the properties of glass and its uses	Describe the simple physical properties of everyday materials	Use observations and ideas to suggest answers to questions	transparent opaque suitable window pane window frame	Clear plastic or acetate, card and sticky tape.
Understand that materials are used to create a variety of furniture	Describe the simple physical properties of everyday materials	Use observations and ideas to suggest answers to questions	fabric furniture cotton mattress soft	Class presentation, pen and pencils, craft materials and fabrics.
Explore a variety of fabrics and understand their different properties	Compare and group together a variety of everyday materials on the basis of their simple physical properties	Identify and classify	wool weather jumper suitable waterproof	Class presentation and clothing.
Explain the uses of materials and why they are suitable	Describe the simple physical properties of everyday material	Use observations and ideas to suggest answers to questions	evaluate material properties tile garden	Class presentation, pen and pencil.





## Year 1 Resource List



Year 1 – Plants Unit				
Lesson Intention	National Curriculum Reference	Scientific Enquiry Covered	Rocket Words Covered	Resources Needed
Understand that seeds grow into plants	Become familiar with common names of flowers and plant structures including seeds	Ask simple questions Observe closely and use simple equipment Use their observations and ideas to suggest answers to questions	seed plant tree soil predict	Variety of seeds, planting equipment: cups, soil, labels, water. Story of Jack and the Beanstalk.
Identify the basic parts of a plant and tree	Identify and describe the basic structure of a variety of common flowering plants, including trees Become familiar with common names of flowers and plant structures	Identify and classify Compare and contrast familiar plants Draw diagrams showing the parts of different plants, including trees	stem petal leaf root flower	2 or 3 fully grown garden plants in pots. Paper and pens for drawing or coloured card, scissors and glue.
Understand that different plants can grow in the same environment	Identify and name a variety of common wild and garden plants	Identify and classify Gather and record data Describe how they are able to identify and group different plants Compare and contrast what they have found out about different plants	environment weed daisy dandelion wild	Clipboards and pens if going on a walk. Scissors and glue if sorting the pictures.
Know the difference between deciduous and evergreen trees	Identify and name a variety of deciduous and evergreen trees	Observe closely, using simple equipment	deciduous evergreen seasons branch bush	Crayons and paper for leaf rubbing; a selection of leaves for children to examine; microscopes or magnifying glasses.
Know that fruit trees and vegetables are varieties of plants	Understand how plants change over time	Observe closely Identify and classify Use their observations and ideas to suggest answers to questions Gather and record data to help in answering questions	supermarket fruit vegetable farm tractor	A selection of fruits and vegetables and their seeds or stones. Tools for cutting.
Record the growth of a plant	Observe the growth of planted flowers Become familiar with plant structures Keep records of how plants change over time	Observe closely Gather and record data	growth seedling young plant adult plant observe	The plants from Lesson 1. Ruler.



## Year 2 Resource List



Year 2 - Animals, including humans 2 - Life cycles Unit				
Lesson Intention	National Curriculum Reference	Scientific Enquiry Covered	Rocket Words Covered	Resources Needed
Order the stages of the human life cycle	Notice that animals, including humans, have offspring which grow into adults	Identifying and classifying	life cycle grow survive independent adult	Class presentation, pen, pencil, scissors, glue.
Describe the stages of a human life cycle	Notice that animals, including humans, have offspring which grow into adults	Identifying and classifying	foetus womb helpless toddler develop	Class presentation, handout.
Identify the offspring and parent of an animal	Notice that animals, including humans, have offspring which grow into adults	Using their observations and ideas to suggest answers to questions	offspring inherit gene resemble differences	Class presentation, scissors, glue, pen, pencil.
Explore the life cycle of a chicken	Notice that animals, including humans, have offspring which grow into adults	Gathering and recording data to help in answering questions	reproduction hatchling chick bar chart predict	Chicks & data, if available. If you have not hatch chicks, use the handout for chick data, squared paper.
Describe the life cycle of a butterfly	Notice that animals, including humans, have offspring which grow into adults	Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions	caterpillar transformation larva chrysalis metamorphosis	Class presentation, resources to enable the children to create a model of a butterfly's life cycle; this may include plasticine, a selection of card or card board, tissue paper, paints/colouring pens, scissors, glue, pipe cleaners.
Explore the life cycle of a frog	Notice that animals, including humans, have offspring which grow into adults	Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions	frog amphibian frogspawn tadpole froglet	Class presentation, pencils, colouring pencils.

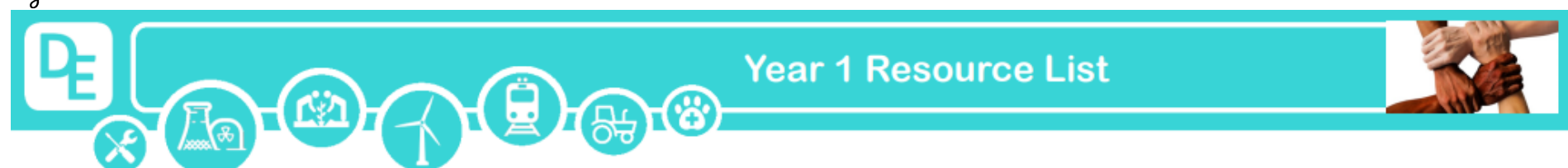


## Year 2 Resource List



Year 2 - Living Things and their habitats Unit				
Lesson Intention	National Curriculum Reference	Scientific Enquiry Covered	Rocket Words Covered	Resources Needed
Explore and compare the differences between things that are living, dead, and things that have never been alive	Explore and compare the differences between things that are living, dead, and things that have never been alive	Identifying and classifying	senses nutrition reproduce excrete respire	Equipment for a classification walk: clipboards, pencils.
Identify and name a variety of plants and animals in a microhabitat	Identify and name a variety of plants and animals in their habitats, including microhabitats	Observing closely, using simple equipment	habitat microhabitat fungi survive shelter	Equipment for a nature hunt: clip boards, pencils. Photographs from the handout if not using the outdoors.
Design a suitable microhabitat where living things could survive	Identify and name a variety of plants and animals in their habitats, including microhabitats	Using their observations and ideas to suggest answers to questions	antennae suitable condition colony insect	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.
Find out what animals eat to survive in their habitats	Describe how animals obtain their food from plants and other animals	Asking simple questions and recognising that they can be answered in different ways Gathering and recording data to help in answering questions	producer consumer herbivore carnivore omnivore	Research tools, e.g. internet and books.
Understand a food chain	Describe how animals obtain their food from plants and other animals, using the idea of a simple food chain	Using their observations and ideas to suggest answers to questions	food chain life cycle nutrients rot caterpillar	Card/paper, scissors, sticky tape, coloured pens/pencils, glue stick. You may prefer to provide the learners with animal pictures to cut out instead.
Understand the journey food makes from the farm to the supermarket	Identify and name different sources of food	Using their observations and ideas to suggest answers to questions	automated frozen food forklift truck refrigerated lorry canned	Scissors, glue, colouring pens/pencils.





Year 1- Animals, including humans 1 - All about me Unit				
Lesson Intention	National Curriculum Reference	Scientific Enquiry Covered	Rocket Words Covered	Resources Needed
Discover the basic parts of the human body	Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense	Identify and classify	head body skeleton limb joint	Class presentation, pen, pencil, wallpaper, marker pens.
Learn about eyes and sight	Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense	Perform simple tests  Gather and record data to help in answering questions	brain eyelash eye sight pupil	Class presentation, drawing materials.
Learn about ears and hearing	Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense	Perform simple tests  Gather and record data to help in answering questions	sound ear sign language vibration deafness	Class presentation, pen, pencil, a range of instruments or different objects to create sounds
Explore the tongue and taste	Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense	Use observations and ideas to suggest answers to questions	tongue mouth taste flavour sweet	Class presentation, 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 include a variety of fruits and vegetables.
Explore the sense of touch	Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense	Gather and record data to help in answering questions	touch fingertips skin organ brain	Class presentation, range of classroom objects.
Discover how your nose smells	Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense	Identify and classify	smell odour nose nostril nose hair	Class presentation, 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.



## Year 1 Resource List



Year 1 - Seasonal Changes Unit				
Lesson Intention	National Curriculum Reference	Scientific Enquiry Covered	Rocket Words Covered	Resources Needed
Understand there are four seasons	Observe changes across the four seasons	Using their observations and ideas to suggest answers to question	season spring summer autumn winter	A large measuring bowl for collecting rainwater. Colouring and drawing resources.
Understand the changes that take place in autumn	Observe changes across the four seasons Observe and describe weather associated with the seasons and how day length varies	Using their observations and ideas to suggest answers to question	autumn hibernate weather protect harvest	Rain gauges, drawing and colouring resources if designing the den, or junk modelling resources if creating a model.
Understand the changes that take place in winter	Observe changes across the four seasons Observe and describe weather associated with the seasons and how day length varies	Using their observations and ideas to suggest answers to questions	winter weather frost sleet temperature	Rain gauges.
Understand the changes that take place in spring	Observe changes across the four seasons Observe and describe weather associated with the seasons and how day length varies	Identifying and classifying	spring compare changes grow chick	Rain gauge, scissors and glue.
Understand the changes that take place in summer	Observe changes across the four seasons Observe and describe weather associated with the seasons and how day length varies	Using their observations and ideas to suggest answers to questions	summer warm sun protection temperature heatwave	Rain gauges, drawing and colouring resources.
Investigate how you can measure rainfall	Observe and describe weather associated with the seasons and how day length varies	Performing simple tests  Gathering and recording data to help in answering questions	rainfall measuring record results graph	The rainwater collected over five weeks. Writing and colouring resources.



Year 1 - Animals, including humans 2 - All about animals Unit				
Lesson Intention	National Curriculum Reference	Scientific Enquiry Covered	Rocket Words Covered	Resources Needed
Discover animal families	Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals	Group and sort	fish amphibian reptile mammal bird	Class presentation, scissors, glue, pen and pencil.
Learn about the differences between mammals and birds	Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets)	Use observations and ideas to suggest answers to questions  Group and sort	feather warm-blooded characteristic backbone hatchling	Class presentation, scissors, glue, pen and pencil.
Learn about the differences between amphibians, reptiles and fish	Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets)	Use observations and ideas to suggest answers to questions  Group and sort	amphibian reptile gills scale cold-blooded	Class presentation and handout to play the game.
Discover the types of food living things eat	Identify and name a variety of common animals that are carnivores, herbivores and omnivores	Use observations and ideas to suggest answers to questions  Group and sort	herbivore carnivore omnivore predator canines	Class presentation.
Explore the difference between wild animals and pets	Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets)	Use observations and ideas to suggest answers to questions  Group and sort	pet wild shelter veterinary natural	Class presentation, pen and pencil.
Explain the characteristics of an animal	Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals	Use observations and ideas to suggest answers to questions  Group and sort	similarities differences compare unsuitable climate	Class presentation.



## Year 2 Resource List



Year 2 – Plants Unit				
Lesson Intention	National Curriculum Reference	Scientific Enquiry Covered	Rocket Words Covered	Resources Needed
Know the difference between seeds and bulbs	Observe and describe how seeds and bulbs grow into mature plants	Identifying differences, similarities or changes related to simple scientific ideas and processes Observing and recording, with some accuracy	seeds bulbs growth plant compare	Variety of seeds and bulbs, cutting equipment, tools for drawing or printing, a variety of liquids.
Design an experiment to find out what plants need to grow	Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy	Asking simple questions and recognising that they can be answered in different ways  Performing simple tests	predict investigate control experiment method	Planting equipment, seeds and variables such as a freezer.
Describe what plants need to grow and stay healthy	Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy	Performing simple tests  Using their observations and ideas to suggest answers to questions	photosynthesis carbon dioxide oxygen glucose energy	A healthy plant and some tape.
Describe the life cycle of a plant	Understand the requirements of plants for germination, growth and survival, as well as, the processes of reproduction and growth in plants	Using their observations and ideas to suggest answers to questions	pollination life cycle germination reproduction seedling	If necessary, pictures of plants at different stages of growth, coloured chalk.
Observe and record the growth of plants over time	Observe and describe how seeds and bulbs grow into mature plants	Performing simple tests Using their observations and ideas to suggest answers to questions Gathering and recording data to help in answering questions	manure crop insulate thrive healthy	Plant experiments from previous lesson.
Understand that plants adapt to suit their environment	Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy	Identifying and classifying	forest desert adapt condition survive	Plant experiments from previous lessons.





## Year 2 Resource List



Year 2 - Uses of everyday materials Unit				
Lesson Intention	National Curriculum Reference	Scientific Enquiry Covered	Rocket Words Covered	Resources Needed
Identify different materials and their uses	Identify and compare the suitability of a variety of everyday materials	Using their observations and ideas to suggest answers to questions	material property suitable object brick	Objects from around the classroom.
Understand how to select the right materials to build a bridge	Identify and compare the suitability of a variety of everyday materials	Performing simple tests	bridge triangle obstacle structure construction	Two books, a range of weights, variety of materials to create a bridge - aluminium foil, card, paper, wood, string, masking tape etc.
Explore and test the stretchiness of materials	Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching	Gathering and recording data to help in answering questions	stretchy elastic floppy hinder limit	A variety of materials of different stretchiness (e.g. cotton, wool, nylon...), tape measure or ruler; scissors, marbles, yoghurt carton, string, paper clips.
Understand that materials can change their shape by twisting, bending, squashing or stretching	Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching	Using their observations and ideas to suggest answers to questions	bend twist squash stretch force	A variety of materials which can be twisted, bent, squashed or stretched (e.g. plasticine, wool, foil...).
Find out about Charles Macintosh and explore how materials are suitable for different purposes	Identify and compare the suitability of a variety of everyday materials	Performing simple tests	mackintosh protective fluorescent safety waterproof	Four different sheets of fabric (tissue, tinfoil, clingfilm, plastic, wool fabric, nylon), beaker, elastic band, one tray per table, syringe per group, water.
Discover which materials change shape when making a road with John McAdam	Identify and compare the suitability of a variety of everyday materials	Performing simple tests	John McAdam merchant bound highway road	Chocolate, microwave, clingfilm, raisins, digestive biscuits crushed to various sizes, heatproof tray.



## Year 2 Resource List



Year 2 – Habitats from around the world Unit				
Lesson Intention	National Curriculum Reference	Scientific Enquiry Covered	Rocket Words Covered	Resources Needed
Learn about habitats	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	Identifying and classifying  Using their observations and ideas to suggest answers to questions	habitat microhabitat organism environment mate	Glue, scissors.
Appreciate that environments are constantly changing	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	Gathering and recording data to help in answering questions	rainforest moisture extinct climate endangered	Clipboard, pen/pencil, *May require permissions if choosing to walk outside school premises
Explore the rainforest and its problems	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	Using their observations and ideas to suggest answers to questions	biodiversity deforestation poaching pollution rainforest	Books/access to the internet for research, colouring pens/pencils, coloured paper, iPads to film videos (optional)
Describe life in the ocean	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	Asking simple questions and recognising that they can be answered in different ways	plankton ocean ecosystem coral reef trench	Materials to create a collage, paper, paints, corrugated card, coloured card, glue, scissors, sticky tack, pens, pencils
Discover the Arctic and Antarctic habitat	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	Identifying and classifying	Antarctic Arctic caribou narwhal tundra	Books/access to the internet for research
Create a model of a habitat	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	Using their observations and ideas to suggest answers to questions	earthworm desert lizard cactus pond	Shoebox/ or cardboard box, craft materials, toy animals,

## Lower key stage 2 – Years 3 and 4

- The principal focus of science teaching in lower key stage 2 is to enable pupils to broaden their scientific view of the world around them. They should do this through exploring, talking about, testing and developing ideas about everyday phenomena and the relationships between living things and familiar environments, and by beginning to develop their ideas about functions, relationships and interactions. They should ask their own questions about what they observe and make some decisions about which types of scientific enquiry are likely to be the best ways of answering them, including observing changes over time, noticing patterns, grouping and classifying things, carrying out simple comparative and fair tests and finding things out using secondary sources of information. They should draw simple conclusions and use some scientific language, first, to talk about and, later, to write about what they have found out.
- ‘Working scientifically’ is described separately at the beginning of the programme of study, but must always be taught through and clearly related to substantive science content in the programme of study. Throughout the notes and guidance, examples show how scientific methods and skills might be linked to specific elements of the content.
- Pupils should read and spell scientific vocabulary correctly and with confidence, using their growing word-reading and spelling knowledge.

Lower Key Stage 2 National Curriculum Working Scientifically
<p>During years 3 and 4, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:</p> <ul style="list-style-type: none"><li>• asking relevant questions and using different types of scientific enquiries to answer them</li></ul>



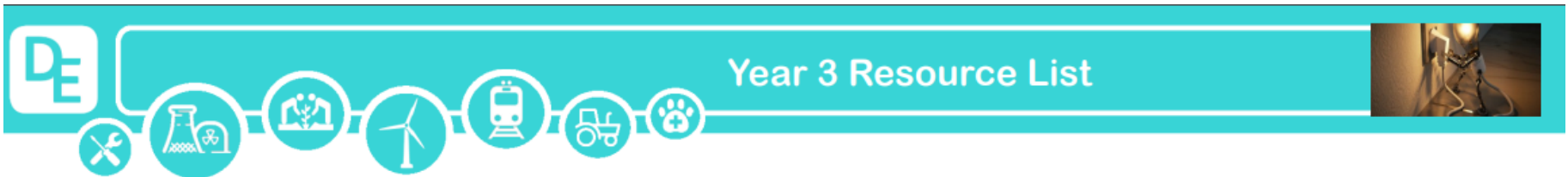
- setting up simple practical enquiries, comparative and fair tests
- making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers
- gathering, recording, classifying and presenting 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
- 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.

Pupils in years 3 and 4 should be given a range of scientific experiences to enable them to raise their own questions about the world around them. They should start to make their own decisions about the most appropriate type of scientific enquiry they might use to answer questions; recognise when a simple fair test is necessary and help to decide how to set it up; talk about criteria for grouping, sorting and classifying; and use simple keys. They should begin to look for naturally occurring patterns and relationships and decide what data to collect to identify them. They should help to make decisions about what observations to make, how long to make them for and the type of simple equipment that might be used. They should learn how to use new equipment, such as data loggers, appropriately. They should collect data from their own observations and measurements, using notes, simple tables and standard units, and help to make decisions about how to record and analyse this data.

With help, pupils should look for changes, patterns, similarities and differences in their data in order to draw simple conclusions and answer questions. With support, they should identify new questions arising from the data, making predictions for new values within or beyond the data they have collected, and finding ways of improving what they have already done. They should also recognise when and how secondary sources might help them to answer questions that cannot be answered through practical investigations.

Pupils should use relevant scientific language to discuss their ideas and communicate their findings in ways that are appropriate for different audiences.

These opportunities for working scientifically should be provided across years 3 and 4 so that the expectations in the programme of study can be met by the end of year 4. Pupils are not expected to cover each aspect for every area of study.



Year 3 – Light Unit				
Lesson Intention	National Curriculum Reference	Scientific Enquiry Covered	Rocket Words Covered	Resources Needed
Identify the difference between light sources and non light sources	Recognise that they need light in order to see things and that dark is the absence of light	Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions	light source natural artificial reflect	Glue and scissors
Explore the light that comes from the sun and how to stay safe	Recognise that light from the sun can be dangerous and that there are ways to protect their eyes	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	vitamin D ultraviolet rays sunburn exposure protection	UV beads, a range of sun creams with at least 3 different SPF values, black paper, sticky tack and a plate
Explore materials which are reflective	Notice that light is reflected from surfaces	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	fluorescent high visibility reflective surface materials	Torches and a range of materials to investigate, such as tin foil, paper, wood, metal and fabric
Discover how shadows are formed	Recognise that shadows are formed when the light from a light source is blocked by an opaque object	Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables	shadow opaque sundial rays blocks	Torch, opaque objects (enough for each child to have one), pencils and paper
Investigate how shadows change throughout the day	Find patterns in the way that the size of shadows change	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	position cast opposite direction length	Data from the shadow stick investigation, ruler and graph paper
Investigate how you can change the size of a shadow	Find patterns in the way that the size of shadows change	Identifying differences, similarities or changes related to simple scientific ideas and processes	size shape closer further puppet	Shadow puppet stage, lighting and handout with puppet silhouettes



## Year 3 Resource List



Year 3 – Animals, including humans				
Lesson Intention	National Curriculum Reference	Scientific Enquiry Covered	Rocket Words Covered	Resources Needed
Explore the 5 key food groups	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	Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions	nutrition carbohydrate protein vitamin mineral	A selection of food for the class to sort into the 5 key food groups
Learn about the nutrition in the food we eat	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	Using straightforward scientific evidence to answer questions or to support their findings	nutrition label portion energy balanced diet	A range of food products containing nutrition labels
Learn about the different types of skeletons	Identify that humans and some other animals have skeletons and muscles for support, protection and movement	Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions	vertebrate invertebrate endoskeleton exoskeleton hydrostatic skeleton	Scissors and glue (optional), research resources: books or internet
Learn about the human skeleton	Identify that humans and some other animals have skeletons and muscles for support, protection and movement	Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts and tables	humerus ulna radius tibia fibular	Scissors, glue and split pins
Learn about animals and their skeletons	Identify that humans and some other animals have skeletons and muscles for support, protection and movement	Identifying differences, similarities or changes related to simple scientific ideas and processes	endoskeleton vertebrate skull rib cage spine	Scissors and glue
Explore the role of muscles	Identify that humans and some other animals have skeletons and muscles for support, protection and movement	Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables	muscle contract hamstrings biceps diaphragm	Split pins



## Year 4 Resource List



Year 4 – Animals, including humans				
Lesson Intention	National Curriculum Reference	Scientific Enquiry Covered	Rocket Words Covered	Resources Needed
Identify the organs in the digestive system	Describe the simple functions of the basic parts of the digestive system in humans	Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables	digestive system oesophagus stomach small intestine large intestine	Glue, scissors, handout, pen and pencils, craft materials and whiteboards
Describe the functions of the main organs in the digestive system	Describe the simple functions of the basic parts of the digestive system in humans	Making systematic and careful observations  Reporting on findings from enquiries, including oral and written explanations	saliva peristalsis absorb liver gall bladder	Pen, pencils and a digestive system model
Identify the types of human teeth and their functions	Identify the different types of teeth in humans and their simple functions	Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables	incisors canines molars jaw gum	A mirror and coloured pencils
Investigate the effects of different liquids on the teeth	Identify the different types of teeth in humans and their simple functions	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	enamel plaque tooth decay cavity fluoride	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
Understand food chains	Construct and interpret a variety of food chains, identifying producers, predators and prey	Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables	ecosystem producer consumer prey predator	Coloured card, string and coloured pencils
Explore food webs	Construct and interpret a variety of food chains, identifying producers, predators and prey	Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables	food web tundra hide interdependence threatened	Pens and pencils, books and access to the internet



Year 4 - States of Matter				
Lesson Intention	National Curriculum Reference	Scientific Enquiry Covered	Rocket Words Covered	Resources Needed
Compare and group the 3 states of matter	Compare and group materials together, according to whether they are solids, liquids or gases	Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions	matter solid liquid gas volume	Examples of the 3 states of matter, scissors, glue and pencils
Explore how particles behave in solids, liquids and 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)	Using straightforward scientific evidence to answer questions or to support their findings	particle bond arranged cooled heated	Ruler, pencil, water, an ice tray, a freezer, a kettle/stove and a thermometer/temperature probe
Investigate melting points	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)	Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers	particle melting melting point temperature thermometer	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, <b>or</b> access to a kitchen stove with a saucepan and bowl over boiling water, thermometer
Explore freezing and boiling points	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)	Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables	freezing reverse boiling sublimation deposition	Computers/tablets, squared paper, coloured pencils, ruler, pencil
Explore evaporation and condensation	Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature	Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions	evaporation condensation absorb water vapour process	Cups or beakers, water, measuring cylinders, graph paper, ruler, pencil
Understand the water cycle	Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature	Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables	water cycle precipitation surface runoff transpiration groundwater	Coloured pencils, pencil, glue and scissors



## Year 4 Resource List



Year 4 - Living things and their habitats				
Lesson Intention	National Curriculum Reference	Scientific Enquiry Covered	Rocket Words Covered	Resources Needed
Explore different habitats	Recognise that living things can be grouped in a variety of ways	Identifying differences, similarities or changes related to simple scientific ideas and processes	habitat microhabitat conditions adapted camouflage	Glue and scissors
Research a habitat	Making a guide to local living things (non-statutory)	Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions	coastal grassland environment climate exposure	Pencils, colouring pens and research tools, such as books and the internet
Explore how animals can be classified	Recognise that living things can be grouped in a variety of ways. Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment	Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions	classify characteristics vertebrate invertebrate species	Pencil, scissors, glue
Create a classification key	Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment	Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions	sub-groups identify criteria classification keys organism	Pencil
Adaptations and classification within species	Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment	Identifying differences, similarities or changes related to simple scientific ideas and processes	adapted region features colouring blubber	Colouring pencils
Explore and classify pond plants	Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment	Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables	ecosystem oxygenised flowering plant non-flowering plant pond dipping	Colouring pencils For pond dipping (optional): a clear container/viewing trays/bucket, teaspoons, nets, magnifying glasses and clip boards



## Year 4 Resource List



Year 4 – Electricity				
Lesson Intention	National Curriculum Reference	Scientific Enquiry Covered	Rocket Words Covered	Resources Needed
Explore electrical appliances and electrical safety	Identify common appliances that run on electricity	Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions	electricity batteries mains electricity appliance socket	Pen, pencils and colouring equipment
Learn about electrical components in a series circuit	Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers	Using straightforward scientific evidence to answer questions or to support their findings	circuit series circuit component cell voltage	PhET slide, batteries, bulb, alligator clips, buzzers, bell, switch and wires
Investigate electrical circuits	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	Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions	current power battery wire bulb	PhET slide, batteries, bulb, alligator clips, buzzers, bell, switch and wires
Explore conductors and insulators	Recognise some common conductors and insulators, and associate metals with being good conductors	Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions	conductor insulator metal copper rubber	PhET Slide, batteries, bulb, alligator clips, 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
Learn about electrical switches	Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit	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	switch current control complete circuit incomplete circuit	PhET Slide, batteries, bulb, alligator clips, wires, 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
Investigate how electrical components can change within a circuit	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	Investigate, record data, analysing data, presenting findings	non-renewable energy renewable energy wind turbines solar panels hydropower	PhET Slide, batteries, bulbs, alligator clips and wires





Year 3 – Forces and Magnets				
Lesson Intention	National Curriculum Reference	Scientific Enquiry Covered	Rocket Words Covered	Resources Needed
Explore contact and non-contact forces	Notice that some forces need contact between 2 objects, but magnetic forces can act at a distance	Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions	force contact force non-contact forces air resistance friction	A range of PE and playground equipment
Compare how things move on different surfaces	Compare how things move on different surfaces	Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers	motion surface resistance texture tilt	A toy boat (or wooden block), thick books, a stopwatch, a cardboard/wooden ramp, a selection of materials e.g. bubble wrap, cling-film, 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.)
Explore different types of magnets	Describe magnets as having 2 poles Predict whether 2 magnets will attract or repel each other, depending on which poles are facing	Setting up simple practical enquiries, comparative and fair tests	magnet attract repel bar magnet horseshoe magnet	Bar magnets and horseshoe magnets
Explore the properties of magnets and everyday objects that are magnetic	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	Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables	magnetism magnetic magnetic field iron steel	A range of magnets and everyday classroom objects
Understand that magnetic forces can act at a distance	Notice that some forces need contact between 2 objects, but magnetic forces can act at a distance	Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment	non-contact forces magnetism attract non-magnetic materials recycle	5 different types of magnet, paperclips, something to hold the magnet, a thin thread, tape and a ruler or tape measure
Explore the everyday uses of magnets	Describe magnets as having two poles	Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers	compass magnetic needle magnetic north direction orienteeering	Compasses, clipboards and writing tools



## Year 3 Resource List



Year 3 – Plants Unit				
Lesson Intention	National Curriculum Reference	Scientific Enquiry Covered	Rocket Words Covered	Resources Needed
Compare the effect of different factors on plant growth	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	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	Planting equipment, seeds
Identify and describe the functions of different parts of a flowering plant and how they are used in photosynthesis	Identify and describe the functions of different parts of a flowering plant	Making systematic and careful observations  Reporting on findings from enquiries, including oral and written explanations	chlorophyll stomata xylem photosynthesis UV light	Onions and a glass of water
Investigate the way in which water is transported within plants	Investigate the way in which water is transported within plants	Making systematic and careful observations	xylem phloem absorb stomata transpiration	Celery in dyed water (prepared 2 days before), cut flowers, water and dye
Explore the part that flowers play in the life cycle of flowering plants	Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal	Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions	anther stigma style filament reproduction	Plasticine and a white board
Understand the pollination process and the ways in which seeds are dispersed	Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal	Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions	pollination pollen nectar seed dispersal pollinator	Equipment so pupils can create a class display
Compare the effect of different factors on plant growth	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	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  Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions	germination vulnerable anchor sapling formation	Plants from the experiment



## Year 4 Resource List



### Year 4 - Living things and their habitats – Conservation

Lesson Intention	National Curriculum Reference	Scientific Enquiry Covered	Rocket Words Covered	Resources Needed
Describe ecosystems and how they are affected by changes in the seasons	Recognise that environments can change and that this can sometimes pose dangers to living things	Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions	ecosystem Northern Hemisphere Southern Hemisphere migrate monsoon	Research tools, such as books and the internet
Understand human impact on the environment through deforestation	Recognise that environments can change and that this can sometimes pose dangers to living things	Using straightforward scientific evidence to answer questions or to support their findings	rainforest deforestation drought biodiversity recycling	Research tools, such as books or the internet. Resources for air pollution catchers: index cards, petroleum jelly, sticky tape and decibel metres
Explore air pollution	Recognise that environments can change and that this can sometimes pose dangers to living things	Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables	fossil fuels pollution greenhouse gases emissions climate change	Index cards, petroleum jelly, sticky tape and decibel metres
Understand water pollution	Recognise that environments can change and that this can sometimes pose dangers to living things	Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions	chemicals sewage contaminate pesticides water treatment plant	Research tools such as books or the internet and a muddy glass of water
Explore methods that can be used to conserve water	Recognise that environments can change and that this can sometimes pose dangers to living things	Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers	conserve drought freshwater pure water butt	Paper, pencils and pens
Understand that humans can have a positive impact on nature	Recognise that environments can change and that this can sometimes pose dangers to living things	Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions	endangered marine sanctuaries protect conservation areas recycling	Paper, pencils, pens and research resources such as books and the internet





## Year 4 Resource List



Year 4 – Sound				
Lesson Intention	National Curriculum Reference	Scientific Enquiry Covered	Rocket Words Covered	Resources Needed
Identify how sounds are made	Identify how sounds are made, associating some of them with something vibrating	Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusion	vibration medium waves eardrum signals	Resources for children to create their presentations, either on paper or digitally
Explore how vibrations from sounds travel through a medium to the ear	Recognise that vibrations from sounds travel through a medium to the ear	Identifying differences, similarities or changes related to simple scientific ideas and processes	source energy particles echo vacuum	Sugar grains, cling film, bowl, speaker string, wire coat hanger, tank of water, two rocks, 2l plastic bottle (bottom cut off) and an inflated balloon
Explore sound insulation	Recognise that vibrations from sounds travel through a medium to the ear	Setting up simple practical enquiries, comparative and fair tests	materials reflect absorb insulate defenders	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
Explore volume	Find patterns between the volume of a sound and the strength of the vibrations that produced it	Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers  Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions	volume decibels decibel metre amplitude power	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
Explore pitch	Find patterns between the pitch of a sound and features of the object that produced it	Identifying differences, similarities or changes related to simple scientific ideas and processes	pitch high pitch low pitch instruments orchestra	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
Explore sounds from near and from far	Recognise that sounds get fainter as the distance from the sound source increases	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	energy particles travel sound source fade	Music through a speaker, tape measure, a decibel metre (you can download an app via a phone or tablet), pencils and graph paper





## Year 3 Resource List



Year 3 – Scientific Enquiry				
Lesson Intention	National Curriculum Reference	Scientific Enquiry Covered	Rocket Words Covered	Resources Needed
How can a solar oven be made more effective: posing questions and writing predictions	Asking relevant questions and using different types of scientific enquiries to answer them	Asking relevant questions and using different types of scientific enquiries to answer them	solar renewable energy scientific investigation prediction plausible	Cardboard box (not too deep) with a lid, black paper or card, foil, a thermometer, sticky tape, straws and a variety of materials to test (such as cling film, fabrics, foil, paper, card and a piece of black bin bag). Optional: chocolate or marshmallows on a plate
How can a solar oven be made more effective: recording and presenting results	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	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	record results data table graph	Cardboard box (not too deep) with a lid, black paper or card, foil, a thermometer, sticky tape, straws and a variety of materials to test (such as cling film, fabrics, foil, paper, card and a piece of black bin bag). Optional: chocolate or marshmallows on a plate
Cleaning coins: writing a method and carrying out a practical test	Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions	Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions	acid alkali PH method practical	A PH testing kit (litmus paper and test indicator), small trays, measuring cylinders, dirty coins and a range of substances to test such as vinegar, oil, ketchup, citric fruit juice, fizzy drinks, toothpaste, soap and water
Cleaning coins: writing a conclusion	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	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	conclusion evidence explanation compare enquiry	Writing tools
Making a cake: fair testing, controls and variables	Setting up simple practical enquiries, comparative and fair tests	Setting up simple practical enquiries, comparative and fair tests	baking measurements fair test control experiment variable	Butter, caster sugar, self-raising flour, eggs, vanilla extract, milk, a mixing bowl, a whisk, a wooden spoon, measuring jug, weighing scales, oven, 20cm cake tin (variables could also include baking powder, water and a selection of different flours, e.g. plain or gluten free)
Making a cake: scientific enquiry	Using straightforward scientific evidence to answer questions or to support their findings Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions	Using straightforward scientific evidence to answer questions or to support their findings Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions	conclusive scientific knowledge equipment diagram collated	Butter, caster sugar, self-raising flour, eggs, vanilla extract, milk, a mixing bowl, a whisk, a wooden spoon, measuring jug, weighing scales, oven, 20cm cake tin (variables could also include baking powder, water and a selection of different flours, e.g. plain or gluten free)



## Year 3 Resource List



Year 3 – Rocks				
Lesson Intention	National Curriculum Reference	Scientific Enquiry Covered	Rocket Words Covered	Resources Needed
Explore the formation and properties of igneous rocks	Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties	Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions	igneous rocks intrusive igneous rock extrusive igneous rock crystals magma	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
Explore the formation and properties of sedimentary and metamorphic rocks	Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties	Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions	sedimentary rock metamorphic rock limestone marble sandstone	A selection of rocks to test, sandpaper, nails, small wooden spoons, water, pipettes, a bowl of water and a microscope or magnifying glass
Weathering and the suitability of rocks for different purposes	Explore how and why [rocks] might have changed over time (non-statutory)	Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions	weathering chemical weathering physical weathering biological weathering acid rain	Vinegar, a pipette, a selection of different rocks and colouring pencils
Explore how water contributes to the weathering of rocks	Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties	Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers	appearance texture submerged erosion receding	A variety of different rocks, bowls of water, weighing scales and a timer
Understand how fossils are formed	Describe in simple terms how fossils are formed when things that have lived are trapped within rock	Identifying differences, similarities or changes related to simple scientific ideas and processes	fossil extinct sediment embedded amber	Salt, flour, coffee grounds, cold coffee or water, a mixing bowl, a mixing spoon and objects to create imprints
Explore different types of soil	Recognise that soils are made from rocks and organic matter	Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers	decompose fragments clay soil chalky soil sandy soil	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

## Upper key stage 2 – Years 5 and 6

- The principal focus of science teaching in upper key stage 2 is to enable pupils to develop a deeper understanding of a wide range of scientific ideas. They should do this through exploring and talking about their ideas; asking their own questions about scientific phenomena; and analysing functions, relationships and interactions more systematically. At upper key stage 2, they should encounter more abstract ideas and begin to recognise how these ideas help them to understand and predict how the world operates. They should also begin to recognise that scientific ideas change and develop over time. They should select the most appropriate ways to answer science questions using different types of scientific enquiry, including observing changes over different periods of time, noticing patterns, grouping and classifying things, carrying out comparative and fair tests and finding things out using a wide range of secondary sources of information. Pupils should draw conclusions based on their data and observations, use evidence to justify their ideas, and use their scientific knowledge and understanding to explain their findings.
- ‘Working and thinking scientifically’ is described separately at the beginning of the programme of study, but must always be taught through and clearly related to substantive science content in the programme of study. Throughout the notes and guidance, examples show how scientific methods and skills might be linked to specific elements of the content.
- Pupils should read, spell and pronounce scientific vocabulary correctly.

## Upper Key Stage 2 National Curriculum Working Scientifically

During years 5 and 6, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:

- planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary
- taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate
- recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs
- using test results to make predictions to set up further comparative and fair tests
- reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and 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

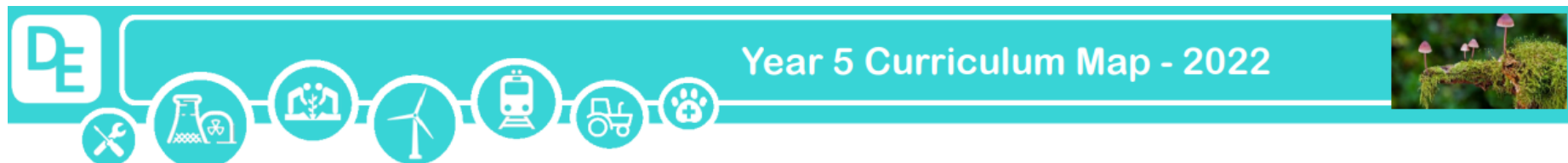
Pupils in years 5 and 6 should use their science experiences to: explore ideas and raise different kinds of questions; select and plan the most appropriate type of scientific enquiry to use to answer scientific questions; recognise when and how to set up comparative and fair tests and explain which variables need to be controlled and why. They should use and develop keys and other information records to identify, classify and describe living things and materials, and identify patterns that might be found in the natural environment.

They should make their own decisions about what observations to make, what measurements to use and how long to make them for, and whether to repeat them; choose the most appropriate equipment to make measurements and explain how to use it accurately. They should decide how to record data from a choice of familiar approaches; look for different causal relationships in their data and identify evidence that refutes or supports their ideas. They should use their results to identify when further tests and observations might be needed; recognise which secondary sources will be most useful to research their ideas and begin to separate opinion from fact.

They should use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas and should talk about how scientific ideas have developed over time.

These opportunities for working scientifically should be provided across years 5 and 6 so that the expectations in the programme of study can be met by the end of year 6. Pupils are not expected to cover each aspect for every area of study.





Year 5 - Living things and their habitats				
Lesson Intention	National Curriculum Reference	Scientific	Rocket Words	Resources
Learn about sexual reproduction	Describe the life process of reproduction in some plants and animals	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	fertilisation, genes, sexual reproduction, pollination, pollen	<i>Images from internet, pens, pencils, colouring pencils</i>
Learn about asexual reproduction	Describe the life process of reproduction in some plants and animals	Plan different types of scientific enquiries to answer questions, including controlling variables where necessary	asexual, plantlet, bulb, tuber, bacteria	Plant (such as strawberries, tomato, basil or chilli), scissors, water, small flowerpot of moist soil, moist rooting powder
Describe the life cycles of a mammal, bird and reptile	Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird	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	unborn, egg, hatch, fledgling, mammary gland	<i>Life Cycle Challenge</i> Computers/Books Handout Pens Paper
Describe the life cycles of an insect and amphibian	Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird	Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs	metamorphosis, larva, pupa, tadpole, butterfly	Pen, pencil, coloured pencils
Know about the life and work of Sir David Attenborough	They should find out about the work of naturalists and animal behaviourists, for example, David Attenborough and Jane Goodall. [Non-statutory]	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	David Attenborough, natural sciences, documentary, naturalist, lecture	Pen and pencil
Know about the life and work of Dame Jane Goodall	They should find out about the work of naturalists and animal behaviourists, for example, David Attenborough and Jane Goodall. [Non-statutory]	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	Jane Goodall, chimpanzee, primatologist, primate, endangered	Lined Paper, colouring pens, paints ICT – research, magazines/internet for pictures and maps



Year 6 – Living things and their habitats				
Lesson Intention	National Curriculum Reference	Scientific Enquiry	Rocket Words	Resources
Classify living things	Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals	Recording data and results of increasing complexity using scientific diagrams and labels, classification keys , tables, scatter graphs, and bar and line graphs.	classify spore micro-organism seed similarities	<i>Create a Classification Key paper, pens, pencils, books/Internet for research</i>
Explore the kingdoms of life	Give reasons for classifying plants and animals based on specific characteristics	Planning different types of enquiries to answer questions including recognising and controlling variables where necessary	multicellular unicellular kingdom cell MRS GREN	<i>Mould Growing Investigation slices of bread, sealable sandwich bags, water, sticky labels, marker pens</i>
Describe the work of Carl Linnaeus	Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals	Identifying scientific evidence that has been used to support or refute ideas or arguments	Latin genus Carl Linnaeus class species	<i>Classification Challenge paper, pens, pencils, books/Internet for research, scissors, glue</i>
Identify different classes of vertebrates	Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals	Reporting and presenting findings from enquiries, including conclusions, casual relationships and explanations of and degree of trust in results, in oral and written forms such as displays or other presentations, identifying scientific evidence that has been used to support or refute ideas	vertebrate cold-blooded amphibian reptile mammal	<i>Classifying Animals paper, pens, pencils, books/Internet for research, scissors, glue</i>
Explore soil habitats	Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals	Grouping and classifying.	carbon dioxide microorganism plant oxygen microscopic	<i>paper, pens, pencils, coloured pencils books/Internet for research, scissors, glue</i>
Describe different types of fungi	Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals	Record scientific data using diagrams	mycelium fungi mushrooms yeasts hyphae	<i>Large mushrooms, clamp stands, clamps, string, skewer to make hole, plain paper, hairspray, ruler</i>





## Year 5 Curriculum Map - 2022



Year 5 – Changes of Materials				
Lesson Intention	National Curriculum Reference	Scientific Enquiry	Rocket Words	Resources
Use evaporation to recover the solute from a solution	Describe how to recover a substance from a solution	Reporting and presenting findings from enquiries, including conclusions	pure substance solute solvent solution evaporate	<i>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°C for 20 minutes will evaporate 3 teaspoons of water and leave salt) or warm place.</i>
Recognise and describe reversible changes	Demonstrate that dissolving, mixing and changes of state are reversible changes	Reporting and presenting findings from enquiries, including conclusions, in oral and written forms	reversible mixture physical change melting evaporate	<i>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.</i>
Observe chemical reactions and describe how we know new materials are made	Explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible	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	irreversible chemical change compare effervescence product	<i>Water, fizzing tablet (such as berroca or alka seltzer), vinegar, bicarbonate of soda, candle, matches, red cabbage indicator*, soapy water, water, milk, small bottles for liquids, small containers (small aluminium pie cases work well)</i>
Investigate rusting reactions	Explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible	Planning different types of scientific enquiry to answer questions, including recognising and controlling variables where necessary	fair test variable control variable corrosion rusting	<i>Small iron nails, test tubes or other small containers, water, salty water, other liquids (lemon juice, cola etc) oil, paint or petroleum jelly</i>
Investigate burning reactions	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.	Identifying scientific evidence that has been used to support or refute ideas or arguments	combustion fuel oxygen extinguish smother	<i>Tea light, matches, beaker, vinegar, bicarbonate of soda</i>
Investigate chemical reactions - acids and bicarbonate of soda	Explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated the action of acid on bicarbonate of soda	Using test results to make predictions to set up further comparative and fair tests	reaction predict acid bicarbonate of soda carbon dioxide	<i>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</i>



## Year 6 Curriculum Map



Year 6 – Evolution and inheritance				
Lesson Intention	National Curriculum Reference	Scientific Enquiry	Rocket Words	Resources
Explain how adaptations help animals and plants survive	Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution	Identify scientific evidence that has been used to support or refute ideas or arguments	adaptation desert cactus insulating environment	<i>Pen, pencil</i>
Describe the process of natural selection	Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago.	Identify scientific evidence that has been used to support or refute ideas or arguments	fossil fossilisation evidence dinosaur petrified	<i>Pen, pencil</i>
Explain why animals can look different to their parents	Recognise that living things produce offspring of the same kind, but that offspring normally vary and are not identical to their parents.	Identifying scientific evidence that has been used to support or refute ideas and arguments	genetically modified crop toxin resilience breeding yield	<i>Pen, pencil</i>
Describe the process of genetic modification	Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents.	Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.	generation species evolution offspring DNA	<i>Extracting DNA from a Banana!, goggles, apron / lab Coat, banana, sealable sandwich bag, warm water, salt, washing up liquid, filter paper, funnel, rubbing alcohol, plastic containers</i>
Explain what fossils can tell us	Identify how animals and plants are adapted to suit their environment in different ways, and that adaptation may lead to evolution	Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.	Charles Darwin habitat ancestor Natural Selection extinct	<i>Camouflaged worms - Individual model 20 plain toothpicks, 20 toothpicks painted to match the floor/carpet, stopwatch, cups, tweezers</i>
Explore the work of palaeontologist Mary Anning	Find out about the work of palaeontologists such as Mary Anning; recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago.	Identify scientific evidence that has been used to support or refute ideas or arguments	Mary Anning specimen prehistoric Jurassic Coast palaeontologist	<i>Make Your Own Fossil Plasticine, plaster of Paris, water, mixing dish/bowl, cocktail sticks</i>





## Year 5 Curriculum Map - 2022



Year 5 – Forces				
Lesson Intention	National Curriculum Reference	Scientific Enquiry	Rocket Words	Resources
Explore gravity and the life and work of Isaac Newton	Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object	Identifying scientific evidence that has been used to support or refute ideas or arguments	Sir Isaac Newton gravity astronomy weight mass	<i>1m ruler/tape measure, weighing scales, variety of balls (tennis ball, soft ball, marble, hockey ball etc), pencil, 2 sheets of paper, stopwatch</i>
Examine the connection between air resistance and parachutes	Identify the effects of air resistance, water resistance and friction, that act between moving surfaces	Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate	Galileo Galilei air resistance opposing streamlined parachute	<i>feather, tennis ball, small plastic toys/weights, stopwatches, variety of materials to test (different types of papers, plastic bags, bin bags, variety of materials), rulers, hole punch, string, calculators</i>
Explore factors which affect an object's ability to resist water	Identify the effects of air resistance, water resistance and friction, that act between moving surfaces	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	water resistance streamlined upthrust buoyant sink	<i>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</i>
Investigate the effects of friction on different surfaces	Identify the effects of air resistance, water resistance and friction, that act between moving surfaces	Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary	friction resistance lubricant Newton meter Newton	<i>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</i>
Investigate mechanisms - levers and pulleys	Recognise that some mechanisms including levers, pulleys and gears allow a smaller force to have a greater effect	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	lever load pivot fulcrum pulley	<i>mini whiteboards, ball, a load to lift per child (weights/1 pint milk bottle/bag of sand etc.), materials to create a pulley - string, cotton reels, dowel, wheels, cardboard</i>
Investigate mechanisms - gears	Recognise that some mechanisms including levers, pulleys and gears allow a smaller force to have a greater effect	Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary	mechanism gear mesh rack and pinion bevel gear	<i>strong cardboard, lolly sticks, paper straws, sticky tape, thin dowel/cocktail sticks, plasticine, sticky tape, glue, compass, scissors</i>



Year 6 – Animals including humans				
Lesson Intention	National Curriculum Reference	Scientific Enquiry	Rocket Words	Resources
Understand the function of the heart and its role in the circulatory system	Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood	Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs	circulatory system atrium ventricle vessel valves	<i>Pipe cleaners, plasticine, craft materials, colouring pencils, mini whiteboards, pen, pencil</i>
Identify and compare blood vessels	Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood	Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate	vessel artery vein capillary microscope	<i>Water (with dye), disposable paper cups, modelling clay, nail/cocktail stick, pen, pencil, stopwatch</i>
Explore blood	Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood	Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs	blood plasma platelet white blood cell red blood cell	<i>Protractor, ruler, pen, pencil, compass, computers, mini whiteboards</i>
Learn how the body transports water and nutrients	Describe the ways in which nutrients and water are transported within animals, including humans	Identifying scientific evidence that has been used to support or refute ideas or arguments	absorb diffusion osmosis concentration nutrients	<i>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</i>
Investigate what affects your heart rate	Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function	Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary	diet exercise heart rate BPM pulse	<i>Timers/stopwatches, heart rate monitors (if possible), PE equipment and attire, foods chosen by children</i>
Learn about the impact of drugs and alcohol on the body	Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function	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	drug painkiller stimulant depressant hallucinogens	<i>Pen, pencil, colouring pencils, coloured paper, computers</i>





Year 5 – Properties of Materials				
Lesson Intention	National Curriculum Reference	Scientific Enquiry	Rocket Words	Resources
Exploring properties of materials	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	Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary	conductive magnetic durable transparent versatile	<i>10 sample pieces of material - wood, paper, card, plastic, string, wool, rubber, different metals, clay, pen and pencils, electrical equipment to make circuits (with a bulb), magnets, torch</i>
Explore thermal conductors and thermal insulators	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	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	thermal conduction molecules degrees Celsius (°C) insulator	<i>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</i>
Explore the hardness of materials	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	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	hardness force iron steel stone	<i>granite tile, ceramic tile, hardwood, softwood, slate, different stones, plastic, metal, card, coin and nail</i>
Discover materials that become soluble in water	Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution	Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary	dissolve solute insoluble soluble solvent	<i>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</i>
Investigate the solubility of materials	Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution	Using test results to make predictions to set up further comparative and fair tests	solute solvent solution substance saturation	<i>a variety of solutes (salt, sugar, jelly, coffee), beakers, water</i>
Explore how mixtures could be separated by filtering, sieving, evaporating or magnets	Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating	Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary	pure substance mixture filtering sieving evaporation	<i>sand, sawdust, gravel, metal nuts, marbles, flour, beakers or containers, filter paper, sieve, colander, magnets</i>



## Year 6 Curriculum Map



Year 6 – Light				
Lesson Intention	National Curriculum Reference	Scientific Enquiry	Rocket Words	Resources
Explore how light travels	Recognise that light appears to travel in straight lines	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	light eye light source symbol scientific diagram	<i>Torch, cardboard tube/a section of hosepipe/paper, card, hole punch, pen, pencil</i>
Explore reflection	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	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	reflected prediction fair test variable table	<i>Torch, white card, mirror, tin foil, jumper/cardigan, carrier bag (try to choose materials which are similar in colour), pen, pencil</i>
Explore reflection and explain how it can be used to help us see	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	Identifying scientific evidence that has been used to support or refute ideas or arguments	periscope angle mirror line of sight utilise	<i>Torch, cereal box, mirrors, scissors, sticky tape, ruler, pencil</i>
Investigate how shadows can change	Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them	Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs	shadow block opaque transparent translucent	<i>Multilink, board marker, whiteboard, torch, ruler, pen, pencil</i>
Investigate how we can show why shadows have the same shape as the object that casts them	Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them	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	plan sun shade real life problem rotate direction	<i>Modelling clay, torch, cocktail sticks, materials for making a screen, pen, pencil, ruler</i>
Investigate how we see objects	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	Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary	optical phenomena disperse spectrum refraction	<i>Water, washing up liquid, straw, glass container, salt, bowl, paper, red, green and blue pens, coloured filters, pencil</i>





Year 6 – Electricity				
Lesson Intention	National Curriculum Reference	Scientific Enquiry	Rocket Words	Resources
Describe the parts of an electric circuit	Use recognised symbols when representing a simple circuit in a diagram	Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs	symbol circuit circuit diagram battery wires	<i>Series circuit equipment including bulbs, wires, switches, buzzers, cells etc, pen, pencil, ruler</i>
Explore voltage and its effect on an electrical circuit	Associate the brightness of a bulb or the volume of a buzzer with the number and voltage of cells used in the circuit	Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary	electricity current voltage voltmeter brightness	<i>Series circuit equipment - including cells and voltmeters, high voltage bulbs, batteries and wires, pen, pencil, ruler</i>
Apply knowledge to identify and correct problems in a circuit	Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit	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	blown resistor variable resistor LED dimmer switch	<i>Laptops/iPads with circuit builder, (alternatively electrical components - wires, batteries, bulbs, resistors, voltage meter etc), pens, pencil, ruler</i>
Investigate what affects the output of a circuit	Compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches	Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary  Using test results to make predictions to set up further comparative and fair tests	output variable fair test control test systematically	<i>Series circuit equipment including bulbs, wires, switches, buzzers, cells etc, pen, pencil, ruler</i>
Build a set of traffic lights	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	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	synchronised traffic light signal sensor timer-based	<i>For <b>each</b> 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</i>
Apply knowledge of conductors and insulators	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	Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate	closed electric circuit indicating conductor insulator resistor	<i>Example electric circuit games, 1 thick corrugated cardboard base approximately 25 cm x 25 cm (to be prepared in advance), pencil, battery holder and cells (Ideally zinc chloride), switch, bulb holder &amp; 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</i>



## Year 5 Curriculum Map



Year 5 – Animals, including humans				
Lesson Intention	National Curriculum Reference	Scientific Enquiry	Rocket Words	Resources
Identify the key stages of a mammal's life cycle	Describe the changes as humans develop to old age	Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs	foetus dependent adolescent puberty reproduce	<i>Scissors, handout (on thin card), pen and pencils, split pins</i>
Explore the gestation periods of mammals	Describe the changes as humans develop to old age	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	gestation pregnant duration extreme breeding	<i>Sticky notes, scissors, pens/pencils, computers/tablets for research</i>
Learn about foetal development	Describe the changes as humans develop to old age	Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs	womb umbilical chord embryo trimester midwife	<i>Pencil, graph paper, ruler, coloured pencils</i>
Investigate the hand span of different aged children	Describe the changes as humans develop to old age	Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate	growth spurt childhood motor skills milk teeth constant	<i>Ruler, tape measure, pens/pencils, paper</i>
Learn about the changes experienced during puberty	Describe the changes as humans develop to old age	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	adolescence puberty hormones mood swing develop	<i>Large paper/wallpaper, sticky tape, pens/pencils</i>
Describe the changes humans may experience during adulthood and old age	Describe the changes as humans develop to old age	Identifying scientific evidence that has been used to support or refute ideas or arguments	lifestyle keratin elasticity cataracts neurodegenerative	<i>Pens, pencils, computers/tablets</i>





## Year 5 Curriculum Map – 2022



Year 5 – Earth & Space				
Lesson Intention	National Curriculum Reference	Scientific Enquiry Covered	Rocket Words Covered	Resources Needed
Describe Nicolaus Copernicus' ideas about planetary motion	Describe the movement of the Earth and other planets relative to the sun in the solar system Describe the sun, Earth and moon as approximately spherical bodies	Identifying scientific evidence that has been used to support or refute ideas or arguments	heliocentric geocentric Nicolaus Copernicus orbit Ptolemy	<i>Planet Mobile 1. Papier Mâché model, 9 balloon, newspaper, PVA glue, bowl, water, rings to stand balloons on while they are drying, paint, paintbrushes, string, 2. Ball Model, 8 polystyrene balls of different sizes, paint, paintbrushes, string,</i>
Describe the movement of the Earth in space	Describe the movement of the moon relative to the Earth Describe the sun, Earth and moon as approximately spherical bodies	Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs	axis season poles eclipse hemisphere	<i>Pencils, paper, colouring pencils</i>
Learn about gravitational force	Use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky	Using test results to make predictions to set up further comparative and fair tests	ocean tides gravitational force black hole Mass celestial	<i>modelling clay, weighing scales, metre stick, stopwatch (optional), camera (optional)</i>
Describe the characteristics of the planets in our solar system	Describe the movement of the Earth and other planets relative to the sun in the solar system	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	rocky planets gas planets dwarf planet Moon solar system	<i>Scissors, backing card</i>
Describe the Big Bang Theory	Describe the movement of the Earth and other planets relative to the sun in the solar system	Identifying scientific evidence that has been used to support or refute ideas or arguments	astronomy universe Milky Way expand Big Bang theory	<i>Balloon, marker pen, measuring tape</i>
Explore what causes the different phases of the Moon	Use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky	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	phase orbit illuminate waxing waning	<i>Paper, scissors, pens, pencils, pictures of the Moon (optional), glue</i>



## Year 6 Curriculum Map



Year 6 – Looking after the environment			
Lesson Intention	National Curriculum Reference - Scientific Enquiry	Rocket Words	Resources
Learn about climate change	Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs	weather climate prevent global warming climate change	<i>2L plastic bottle, permanent marker, sticky tape, skewers/plastic straws, rulers, scissors, thermometer, coloured paper, colouring pens/pencils</i>
Explore ways to reduce how much rubbish is sent to landfill	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	recycle landfill rubbish biodegrade council	<i>Classroom bin (full!), rubber gloves, computer/tablets for research, pen, pencil</i>
Explore ways to reduce energy consumption	Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs	net zero renewable non-renewable greenhouse gases emissions	<i>Clipboards, pencils, calculators, computers/tablets for research</i>
Explore what happens when fuels are burnt	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	industrial revolution fossil fuel coal combustion fuel	<i>Candle, matches, metal spoon, computers/tablets for research, pen, pencil</i>
Explore the outcomes of COP26	Identifying scientific evidence that has been used to support or refute ideas or arguments	COP sustainability conference pledge subsidy	<i>Computers/tablets, pen, pencil</i>
Compare data associated with the weather	Using test results to make predictions to set up further comparative and fair tests	species sensitive natural disaster habitat vulnerable	<i>Computers/tablets, temperature and rainfall data collected + comparison data, graph paper, pen, pencil</i>



