Barrowby CE Primary School

Science Curriculum

Vision:
We aim to stimulate our pupils' interest and curiosity about their surroundings, creating and fostering a sense of wonder about the world and the implications of Science.

Intent:
Our aim is that all pupils are equipped with the scientific knowledge required to understand the uses and implications of science, today and for the future. Children will be encouraged to work and think scientifically, developing experimental and investigative skills and use scientific vocabulary to express their findings and theories.

Teaching and learning in science reflects our belief that children have a natural sense of awe and wonder in the world around them. We aim to stimulate and excite pupils' curiosity about events and things in the world around them. We will do this by supporting them to develop a secure science knowledge base and encouraging them to ask questions and make predictions to further develop their scientific enquiry skills. Scientific enquiry is about developing and evaluating explanations through experimental evidence and modelling.

Science is an exciting and relevant part of our creative curriculum which enables children to learn about, observe and explore the world in which they live. The Science teaching in school actively encourages children to work both independently and with others in practical ways, developing secure subject knowledge, investigative skills and scientific vocabulary. This will enable them to become lifelong learners and make a positive contribution to society.

Implementation:

Our Reception children will follow the guidelines for Science outlined in the 'Understanding the World – The Natural World' within the EYFS framework.

Our Key Stage 1 and 2 pupils will be taught the Science Curriculum through a carefully sequenced curriculum that builds on knowledge and skills at each phase of education. Throughout each key stage, children will cover science topics with carefully progressive steps to ensure a continuance of development. Where possible, some foci have been linked to main topic areas, whilst others are structured separately. The Long-Term Curriculum Map details when each is visited.

Each term children are given opportunities for:

(i) practical activities

(ii) science investigations

(iii) individual, group and whole class discussion and activities

Children will consider methods of recording their work and will be encouraged to record it in different ways.

Children will be grouped in a variety of ways according to the nature of the activity including working in groups, as a class and as individuals.

For pupils with SEND, it is important to focus on the pupils' strengths as well as identifying areas where they need more help, practice and consolidation. In general, pupils should have the opportunity to develop all the concepts, regardless of their SEN or disability. However, the approach to these concepts may have to be done differently with different groups of pupils.

Impact:

The successful approach to the teaching of Science at Barrowby CE Primary School will result in a fun, engaging and high-quality Science education, that will provide children with the foundations for understanding the world in which they live.

Assessment takes places each term. ***Knowledge*** and ***Scientific Enquiry*** skills are assessed separately with carefully planned assessment foci (AFs) that match with the topic of that term.

Children at Barrowby CE Primary School will:

- demonstrate a love of Science and develop an interest in further study and research.
- retain knowledge that is pertinent to Science in a real - life context.
- be able to question ideas and reflect on knowledge.
- be able to articulate their understanding of scientific concepts and be able to reason scientifically using rich vocabulary.
- work collaboratively and practically to investigate and experiment.

The Science Curriculum for Reception– Cycle A

	Autumn Term - Ourselves	Spring Term – Extinct & Endangered	Summer Term – Homes and Habitats
Unit	. **Understanding the world** **The Natural world**	**Understanding the world** **The Natural world**	**Understanding the world** **The Natural world**
Vocab	**Head, shoulders, knees, toes, see, hear, touch, smell, taste, tress, plants, Autumn, leaves, wind, heat, cool, changes**	**Weather, Spring, blossom, buds, dinosaurs, reptiles, meat eater, plant eater, water, ice, freezing, melting**	**Summer, sun, shade, water, nutrients, shelter, light, solid, liquid**
Suggested Support for children with additional needs.	Use of stickers and other pace markers to motivate children. Availability of a low arousal area to minimise stimulation for those children that find formal learning patterns challenging.	Use of artefacts and objects to make learning visual and tactile. Immediate praise given for good questions and contributions to lessons.	Group children carefully when using equipment and provide adult support where accuracy is needed. Use ICT to motivate children. Record ideas, video activities, take pictures to record learning.
	Children can explore the natural world around them and will make simple observations about what they see, hear and feel.	Children will discuss likes/dislikes about their environment, making observations and drawing pictures.	Children can talk about some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class.
	Children can discuss how the seasons change and observe natural features such as trees or plants change with the seasons and a simplistic version of why this happens i.e. it gets colder in the winter and some of the trees lose their leaves.	Children can discuss how the seasons change and observe and record this (trees, flowers, weather).	Children can discuss how the seasons change and the similarities and differences between the four seasons.
	Children will make simple observations about what has been read in class, e.g. simple physical attributes of living things.	Children can draw on their experiences and what has been read in class to make informed observations about living things.	Children will explore the natural world around them, making observation and drawing pictures of animals and plants that are increasingly detailed.
	Children will know that living things needs to be looked after and treated with care.	Children will know that living things need different things to survive, depending on their environment.	Children know what plants and animals need to grow and survive.
	Children observe and discuss how states of matter change (heating, melting, cooling).	Children observe and discuss how states of matter change (melting ice freezing water).	Children will understand some important processes, including changing states of matter.
	Final Knowledge Assessment	Final Knowledge Assessment	Final Knowledge Assessment

The Science Curriculum for Reception– Cycle B			
	Autumn Term – Commotion in the Ocean	**Spring Term – Wagon's Roll**	**Summer Term – Open your Eyes**
Unit	. **Understanding the world** **The Natural world**	**Understanding the world** **The Natural world**	**Understanding the world** **The Natural world**
Vocab	**Ocean, fish, crabs, whales, rock pools, seaweed, trees, plants, Autumn, leaves, wind, heat, cool, changes**	**Weather, Spring, blossom, buds, hot, wet, dry, desert, cacti, water, ice, freezing, melting**	**Summer, sun, shade, water, nutrients, shelter, light, solid, liquid, seeds, plants, flowers, vegetables**
Suggested Support for children with additional needs.	Use of stickers and other pace markers to motivate children. Availability of a low arousal area to minimise stimulation for those children that find formal learning patterns challenging.	Use of artefacts and objects to make learning visual and tactile. Immediate praise given for good questions and contributions to lessons.	Group children carefully when using equipment and provide adult support where accuracy is needed. Use ICT to motivate children. Record ideas, video activities, take pictures to record learning.
Step			
	Children can explore the natural world around them and will make simple observations about what they see, hear and feel.	Children will discuss likes/dislikes about their environment, making observations and drawing pictures.	Children can talk about some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class..
	Children can discuss how the seasons change and observe natural features such as trees or plants change with the seasons and a simplistic version of why this happens i.e. it gets colder in the winter and some of the trees lose their leaves.	Children can discuss how the seasons change and observe and record this (trees, flowers, weather).	Children can discuss how the seasons change and the similarities and differences between the four seasons.
	Children will make simple observations about what has been read in class, e.g. simple physical attributes of living things.	Children can draw on their experiences and what has been read in class to make informed observations about living things.	Children will explore the natural world around them, making observation and drawing pictures of animals and plants that are increasingly detailed.
	Children will know that living things needs to be looked after and treated with care.	Children will know that living things need different things to survive, depending on their environment, e.g. Cacti in the desert.	Children know what plants and animals need to grow and survive.
	Children observe and discuss how states of matter change (heating, melting, cooling)	Children observe and discuss how states of matter change (melting ice freezing water).	Children will understand some important processes, including changing states of matter.

The Science Curriculum for Year One – Cycle A

	Autumn Term - Ourselves	Spring Term – Extinct & Endangered	Summer Term – Homes and Habitats
Unit	***Animals including Humans*** Identify, name and label exterior parts of the human body. Identify and name the 5 senses. Which part of the body is associated with each sense? Identify the need for personal hygiene, including teeth, a balanced diet and exercise. ***Seasonal changes*** Observe and record changes in weather, e.g. Autumn to Winter Observe changes in length of day linked to seasons. .	***Animals including Humans*** Identify dinosaurs that were herbivores, carnivores or omnivores. Identify and name endangered animals that include carnivores, herbivores and omnivores. Describe/compare the structure of some easily identifiable endangered animals. ***Seasonal changes*** Observe and record changes in weather, e.g. Autumn to Winter Observe changes in length of day linked to season	***Everyday Materials*** Using our environment, identify and name a variety of everyday materials and describe their properties. Distinguish between an object and the material from which it is made. Examine ways materials are useful for different purposes. ***Plants*** Identify and name a variety of common wild and garden plants, describing their basic structure. Identify different deciduous and evergreen trees in our school environment.
Vocab	**Sight, smell, taste, touch, hearing, eyes, nose, tongue, skin, ears, fruit, vegetables, evidence** **Autumn, day, night, wind, rain, leaves**	**Herbivores, carnivores, omnivores, reptile, bird, fish, mammal, question, explore** **Spring, day, night, showers, wind, blossom, buds**	**Object, material, wood, plastic, glass, metal, rock, waterproof, rough, shiny, dull, identify, classify** **Deciduous, evergreen, trunk, stem, leaf, petal, root**
Suggested Support for children with additional needs.	Use artefacts and visual aids as a starting point for acquisition of vocabulary. Use of ICT to photograph and record learning - avoiding unnecessary written work which might challenge motivation.	Transitions from whole-class to group or independent work, and back, is clearly signalled. Use open-ended questions to ensure all children have opportunities to answer.	Give immediate verbal feedback and use pace markers (stickers) to motivate children. Provide low arousal areas to minimise distraction and maximise learning.
Step			
1	Initial Knowledge Assessment **Can you name the 5 senses, and the parts of the body associated with them?**	Initial Knowledge Assessment **What is the difference between a herbivore, omnivore and carnivore?**	Initial Knowledge Assessment **Can you name a variety of everyday materials and what they are used for?**
2	Head, Shoulders, Knees and Toes: Identify and label exterior parts of the human body.	Learn about animals in the reptile family and know that dinosaurs were reptiles. Identify what makes an animal a reptile: scales, lay eggs, cold blooded	Identify and describe different materials from a selection of everyday items: Plastic, wood, glass, metal

3	Identify our 5 sense organs and what they enable us to do. Eye, ear, skin, tongue, nose.	Understand what herbivorous / carnivorous / omnivorous animals eat. Identify which key dinosaurs belong to each group. *AF2 Scientific Enquiry Assessment. Identifying & Classifying. Use simple features to compare living things.*	Identify items made of plastic, wood, glass and metal in our classroom learning environment. Understand why some materials are useful for different purposes: glass = transparent = window
4	Explore the human skeleton learning the names for key bones. Identify where they are found and what some of their functions are: skull protects brain / rib cage protects heart and lungs.	Understand the difference between extinct and endangered. Know that dinosaurs are extinct and can never return. Identify some animals that are endangered.	Experiment with materials to find out which ones are waterproof and which ones are not.
5	Understand why we need to look after our bodies and how to do this – healthy eating, exercise, dental hygiene and hand washing.	Understand ways in which we can protect endangered animals. Identify animals and suggest ways we can prevent them from becoming extinct in the future.	Observe changes in materials and describe their state. (Ice / chocolate / water) when they are heated or cooled. *AF4 Scientific Enquiry Assessment. Observing and measuring. Use simple measuring equipment to observe changes.*
6	Know what humans need to grow and survive: food, water, air, shelter and love. *AF1 & 6 Scientific Enquiry Assessment. Questioning and Using evidence for conclusions. Begin to notice patterns and relationships.*	Welcome to Spring: Understand how the weather changes moving from Winter into Spring: day length, clothes, weather, new life	Identify and name a variety of common wild and garden plants, describing their basic structure.
7	Welcome to Winter: Understand how the weather changes moving from Autumn into Winter: day length, clothes, weather.	Nature Walk: Identify signs of Spring in our school environment – blossom, buds, spring flowers, insects	Identify different deciduous and evergreen trees in our school environment.
8	Nature Walk: Identify signs of Winter in our school environment – bare trees, lack of colour, temperature.		
9	Final Knowledge Assessment **Can you name the 5 senses, and the parts of the body associated with them?**	Final Knowledge Assessment **What is the difference between a herbivore, omnivore and carnivore?**	Final Knowledge Assessment **Can you name a variety of everyday materials and what they are used for?**

The Science Curriculum for Year One – Cycle B

	Autumn Term – Commotion in the Ocean	Spring Term – Wagon's Roll	Summer Term – Open your Eyes
Unit	***Animals including Humans*** Identify and name a variety of common animals that we find in and around the ocean including fish, reptiles, birds and mammals. Identify herbivores and carnivores, prey & predators. ***Seasonal changes*** Observe changes in length of day linked to seasons.	***Everyday materials*** Identify everyday materials and examine which are natural and synthetic. Compare and group materials on the basis of similar physical properties. Investigate which materials float and sink. ***Plants and Animals*** Name and identify common plants and animals that grow in the desert. Examine what they need in order to survive in a hot and dry climate.	***Plants*** To identify parts of flowering plants and vegetables including the roots. Describe the basic structure of common plants including trees. ***Animals including humans*** Identifying, grouping and naming common animals, including mini-beasts/insects, identify and describe the structure of mini-beasts, discuss life cycles of common animals.
Vocab	**Fish, reptiles, birds, mammals, carnivore, herbivore, prey, predator, results** **Autumn, day, night, wind, rain, leaves**	**Object, material, wood, plastic, glass, metal, rock, natural, man-made, float, sink, air, predict, observe, measure** **Dry, water, cacti, snakes, camels, day, night, sun, wind**	**Petal, stem, leaf, root, vegetables, flowers, fruit, trunk, branches, insects, spiders, life cycle, butterfly, caterpillar, pupa, findings**
Suggested Support for children with additional needs.	Transitions from whole-class to group or independent work, and back, is clearly signalled. Use open-ended questions to ensure all children have opportunities to answer.	Give immediate verbal feedback and use pace markers (stickers) to motivate children. Provide low arousal areas to minimise distraction and maximise learning.	Use artefacts and visual aids as a starting point for acquisition of vocabulary. Use of ICT to photograph and record learning - avoiding unnecessary written work which might challenge motivation.
Step			

1	Initial Knowledge Assessment **Which animals and plants live in and around the ocean?**	Initial Knowledge Assessment **Which materials are natural and which materials are synthetic?**	Initial Knowledge Assessment **Can you label the different parts of a flowering plant and root vegetable?**
2	Using non-fiction resource books, identify and name lots of common animals we find in and around the ocean. Sort and classify them in to groups.	Identify materials from a selection of everyday items. Compare different finishes of the same material and identify why they belong to that particular group.	Compare a selection of flowering plants and identify their parts: petals, stem, leaves, roots.
3	Identify what makes a creature a fish or a reptile. Build on knowledge from dinosaurs (reptiles) last term.	Investigate which materials are found naturally: wood and wool. Compare how these materials may be used and why they are useful for different purposes.	Observe a selection of root vegetables and notice similarities with flowering plants. Identify the leaves, stem, root. (carrots, beetroot)
4	Identify what makes a creature a bird or a mammal. Explore whales and ask questions to determine which family of animal it belongs to.	Experiment with materials to find out which float and which sink. Use results to begin to notice patterns and relationships between materials. *AF4 Scientific Enquiry Assessment. Observing and Measuring. Observe changes using simple equipment*	Observe a selection of trees in our school grounds, identify and label its parts: leaves, branches, trunk, roots, bark
5	Use evidence from resources to determine which ocean creatures are predators / prey. Link this to herbivore / carnivore from dinosaur topic.	Observe changes in materials and describe their state. (Ice / chocolate / water) when they are heated or cooled.	Plant a broad bean seed in a transparent container and notice that it grows a shoot and a root.
6	Examine camouflage in the ocean and how animals use it to protect themselves and to hunt. Research and list animals that use camouflage effectively.	Name and identify plants and animals that grow in the desert. Raise simple questions to determine what they need to survive in an arid climate.	Identify and name a selection of minibeasts. Sort and classify them into groups. Identify what makes a creature an insect.
7	Welcome to Winter: Understand how the weather changes moving from Autumn into Winter: day length, clothes, weather.	Nature Walk: Identify living (plants and animals) things in our school environment. Record your findings.	Carry out a simple test – observe and record as many creatures in our wildlife area. Sort into insects / not insects: six legs, three body parts. *AF5 Scientific Enquiry Assessment. Reporting on and presenting findings – Record simple data.*
8	Nature Walk: Identify signs of Winter in our school environment – bare trees, lack of colour, temperature. *AF7 Scientific Enquiry Assessment. Using results – Experience different types of scientific enquiries, including practical activities.*	Final Knowledge Assessment **Which materials are natural and which materials are synthetic?**	Life cycle of a butterfly. Observe metamorphosis with butterfly kit. Observe and record changes. Present findings with a simple diagram: egg, caterpillar, pupa/ chrysalis, butterfly
9	Final Knowledge Assessment **Which animals and plants live in and around the ocean?**		Final Knowledge Assessment **Can you label the different parts of a flowering plant and root vegetable?**

The Science Curriculum for Year Two – Cycle A -			
	Autumn Term – Ourselves	**Spring Term – Extinct & Endangered**	**Summer Term – Homes and Habitats**
Unit	**Animals including Humans** Identify, name and label interior parts of the human body: including key bones of the skeleton and key organs. Re-cap our five senses and realise which organs enable them. *Recognise the process of reproduction and growth in humans.* *Find out about what humans need to survive including personal hygiene, a balanced diet and exercise.*	**Animals including Humans** *Identify how different dinosaurs (*herbivores, carnivores or omnivores) differ from each other in terms of size, speed and teeth. Identify that dinosaurs are reptiles. Link to other reptiles that may know and discuss reptilian features. Identify and name endangered animals that include carnivores, herbivores and omnivores. Describe and compare the structure of polar bears and panda bears.	**Living Things and their Habitats** Explore and compare the differences between living, non-living, never been alive. Identify how most living things (plants and animals) are suited to their habitats. Use the context of the school pond to create simple food chains and life cycles such as a frog. Identify and understand what a microhabitat is. **Everyday materials** Identify and compare the suitability of everyday materials found in our school grounds—including our wildlife area, allotment, gardens and adventure playground.
Vocab	**Skull, rib cage, pelvis, femur, heart, lungs, stomach, kidneys, liver, skin, sight, smell, taste, touch, hearing, eyes, nose, tongue, fruit, vegetables, protein, carbohydrates, baby, child, adult, elder, evidence, conclusions**	**Herbivores, carnivores, omnivores, reptile, bird, fish, mammal, molars, canines, cold blooded, egg, Arctic, Asia, question**	**Object, material, wood, plastic, glass, metal, rock, pond, frog, life cycle, metamorphosis, microhabitat, surface, midwater, lily pads, shelter, predict, identify, classify**

Suggested Support for children with additional needs.	Use artefacts and visual aids as a starting point for acquisition of vocabulary. Use of ICT to photograph and record learning - avoiding unnecessary written work which might challenge motivation.	Transitions from whole-class to group or independent work, and back, is clearly signalled. Use open-ended questions to ensure all children have opportunities to answer.	Give immediate verbal feedback and use pace markers (stickers) to motivate children. Provide low arousal areas to minimise distraction and maximise learning.
Step			
1	Initial Knowledge Assessment **Can you name and label the parts of a human skeleton?**	Initial Knowledge Assessment **Can you describe the features of a reptile?**	Initial Knowledge Assessment **Can you draw, label and describe the lifecycle of a frog?**
2	Identify our 5 sense organs and what they enable us to do. Eye, ear, skin, tongue, nose.	The Reptile Family: Learn about characteristics of reptiles – scales, lay eggs, cold blooded. Sort and group a variety of animals into reptiles (including dinosaurs) and non- reptiles.	Identify items made of plastic, wood, glass and metal in our school environment. Understand why some materials are useful for different purposes: metal used for strength, wood used for shaping etc..
3	Investigate some of our senses and perform simple tests to understand the effects they have on our bodies.	Understand what herbivorous / carnivorous / omnivorous animals eat. Understand which dinosaurs belong to each group. Raise relevant questions about size, speed and teeth. *AF2 Scientific Enquiry Assessment. Identifying & Classifying. Decide how to sort and group living things.*	Explore objects that are living, non-living and those that have never been alive. Ask questions such as is a fallen apple living or non-living?
4	Explore the human skeleton learning the names for key bones. Identify where they are found and what their function is.	Explore which animals are endangered and what this means. Ask questions about why they are endangered and how we can help to protect them. Sort and group some endangered animals using prior knowledge to inform decisions.	Examine the habitat of a pond. Identify the animals that live in and around a pond and how they are suited to this environment.
5	Understand why we need to look after our bodies and how to do this – healthy eating, exercise, dental hygiene and hand washing.	Mini study: Polar Bear. Use simple secondary sources to find answers to questions about polar bears.	Use the context of our school pond to create a simple food chain. Understand patterns and relationships between living things that share the same habitat.
6	Recognise how we change physically as we grow older. Identify how our needs and levels of independence change as we get older. *AF1 & 6 Scientific Enquiry Assessment. Questioning & Using evidence for conclusions. Use observations and ideas to suggest answers to questions, talking about what has been found out.*	Mini study: Panda Bear. Use simple secondary sources to find answers to questions about panda bears.	Observe the metamorphic changes involved in life cycles. Examine the life cycle of a frog and recognise patterns with other life cycles.
7	Understand that the body is built in layers. Identify key organs, their location and purpose.	Nature Walk: Identify signs of Spring in our school environment – blossom, buds, spring flowers, insects	Identify micro-habitats within our wildlife area. Examine conditions such as sun, shade and shelter and understand why certain creatures are suited to these conditions. *AF4 Scientific Enquiry Assessment. Observing and measuring. Use simple measuring equipment to gather data.*

8	Nature Walk: Identify signs of Autumn/Winter in our school environment.		
9	Final Knowledge Assessment **Can you name and label the parts of a human skeleton?**	Final Knowledge Assessment **Can you describe the features of a reptile?**	Final Knowledge Assessment **Can you draw, label and describe the lifecycle of a frog?**

The Science Curriculum for Year Two – Cycle B			
	Autumn Term – Commotion in the Ocean	**Spring Term – Wagon's Roll**	**Summer Term – Open your Eyes**
Unit	**Living Things and their Habitats** Identify a variety of common animals that we find	**Everyday materials** Identify and compare the suitability of a variety of	**Plants** Identify parts of a plant above ground and below

	in and around the ocean (fish, reptiles, birds and mammals.) Use the context of the ocean to create simple food chains. Identify and understand what an ecosystem is: deep sea ocean, coral reefs, rock pools.	materials (including wood, leather, wool, glass, rock, wax) for particular uses in the context of the Wild West/cowboys. Discover the difference between natural and man -made materials such as wool and leather and examine how their properties suit different purposes. Find out how the shapes of solid objects can change shape by bending, squashing and stretching. **Plants** Name and identify plants that grow in the desert and how they are adapted to be able to survive in an arid climate. Compare these to plants that grow in our school environment.	ground. Examine the characteristics of living things and what they need in order to survive. Observe and describe how seeds and bulbs grow into mature plants. Understand that seeds and bulbs have a food store inside of them and observe growth changes over time. ***Animals including humans*** Examine the characteristics of an insect and describe their structures. Use the context of the school wildlife area to create simple life cycles such as a butterfly.
Vocab	**Fish, reptiles, birds, mammals, carnivore, herbivore, prey, predator, food chain, ecosystem, habitat, conservation, crustaceans, results**	**Object, material, wood, plastic, glass, wool, leather, wax, metal, rock, natural, synthetic, bend, stretch, squash, predict, observe** **Arid, dry, water, succulent, cacti, sidewinder snakes, camels, nocturnal,**	**Petal, stem, leaf, root, vegetables, flowers, fruit, trunk, branches, insects, spiders, life cycle, butterfly, metamorphosis, insect, head, thorax, abdomen, seeds, bulbs, shoot, water, nutrients, shelter, light, findings,**
Suggested Support for children with additional needs.	Transitions from whole-class to group or independent work, and back, is clearly signalled. Use open-ended questions to ensure all children have opportunities to answer.	Give immediate verbal feedback and use pace markers (stickers) to motivate children. Provide low arousal areas to minimise distraction and maximise learning.	Use artefacts and visual aids as a starting point for acquisition of vocabulary. Use of ICT to photograph and record learning - avoiding unnecessary written work which might challenge motivation.
Step			
1	Initial Knowledge Assessment **Identify different 'families' of animals that live in and around the ocean?**	Initial Knowledge Assessment **Which materials are natural and which materials are synthetic and how do they suit different purposes?**	Initial Knowledge Assessment **What do living things need to survive?**
2	Identify a variety of animals that live in and around the ocean. Sort and group these animals into fish, reptiles, birds and mammals.	Identify materials from a selection of everyday items. Using the context of the wild west, explore uses / properties of natural materials	Compare a selection of flowering plants and identify their parts above ground and below ground: petals, stem, leaves, anther, roots / root hairs.
3	Explore mammals in the ocean and raise simple questions such as 'Why is a whale not a fish?' Through story book 'my friend whale'	Observe changes to materials when a force is applied: bending, squashing and stretching.	Investigate what living things need in order to survive: air, water, food and shelter. Sort and group objects into living/ non-living/never been alive.

4	Ask questions to identify predators and prey in the ocean. Create simple food chains to show relationships between what animals eat. *AF7 Scientific Enquiry Assessment. .Using results – Ask questions and use simple secondary sources to find answers.*	Examine the difference between natural and man-made materials linked to the life in the wild west. Wood, wool, leather, gold, glass,	Plant seeds and observe their growth in different conditions. (Light and dark) Identify what seeds need in order to grow successfully.
5	Explore the ecosystem of a coral reef. Identify creatures that live in them and how they have adapted over time to their habitat.	Investigate reversible / irreversible changes through planning and performing a simple test. *AF3 & 4 Scientific Enquiry Assessment. Plan and perform tests. Observing and Measuring - Observe changes over time using simple equipment*	Record results from last week's experiment. Make a conclusion to the question posed – do plants grow better in the light or dak and why? Plant a broad bean seed in a transparent container and notice that it grows a plumule (shoot) and a radicle (root).
6	Explore the ecosystem of a rock pool. Identify creatures that live in them and how they have adapted over time to their habitat.	Name and identify plants that grow in the desert. Raise simple questions and use scientific vocabulary to explain how they are adapted to their arid surroundings – such as protection from predators and heat.	Plant a hyacinth bulb and observe changes over time. Understand that bulbs and seeds have a food store which feeds the plant when it begins to grow.
7	Examine camouflage in the ocean and how animals use it to protect themselves and to hunt. Look at colour, pattern and imitation techniques. Are there any animals that cannot camouflage but would be useful to be able to?	Name and identify animals that grow in the desert. Raise simple questions and use scientific vocabulary to explain how they are adapted to their arid surroundings – such as protection from predators and heat.	Identify and name a selection of minibeasts. Sort and classify them into groups. Identify what makes a creature an insect: three body parts and six legs. Label a variety of insects including: head, thorax, abdomen, legs, wings, sting and proboscis. *AF5 Scientific Enquiry Assessment. Reporting on and presenting findings – Begin to use scientific language to communicate findings.*
8	Test and experiment how salt effects water – density. Use an egg to illustrate the effect it has and make links with ocean water to develop understanding of how large mammals such as whales stay afloat.	Part 1: Compare by making observations with plants and animals that live in our school environment. Notice similarities and differences in adaptions and habitat.	Life cycle of a butterfly. Observe metamorphosis with butterfly kit. Observe and record changes. Present findings with a life cycle diagram: egg, caterpillar, pupa/ chrysalis, butterfly. Identify patterns with other metamorphic life cycles – frog.
9	Welcome to Winter: Understand how the weather changes moving from Autumn into Winter: day length, clothes, weather.	Part 2: Record adaptations of things found in last lesson.	Final Knowledge Assessment **What do living things need to survive?**
10	Final Knowledge Assessment **Identify different 'families' of animals that live in and around the ocean?**	Final Knowledge Assessment **Which materials are natural and which materials are synthetic and how do they suit different purposes?**	

The Science Curriculum for Year 3					
	Autumn Term – Stone Age		**Spring Term – Ancient Greece**	**Summer Term – Ancient Egypt**	
Unit	**Rock and Soils** Compare and group	**Magnets and Forces** Compare how far	**Light** Recognise that dark is the absence of light.	**Animals including humans:**	**Plants** Identify and describe

	together different types of rocks on the basis of their appearance, uses and simple physical properties including permeability. Understand that fossils are formed when living things have been trapped within rock. Recognise that soils are made from rocks and organic matter.	things move on different surfaces. Notice that some forces need direct contact but magnetic forces can act at a distance. Investigate attraction and repulsion of magnets and materials. Describe magnets as having two poles and predict attraction / repulsion depending on which poles are facing.	Investigate the differences between natural and artificial light. Understand that light from the sun can be dangerous and that we can protect our eyes from this. Recognise that shadows are formed when the light from a source (natural or artificial) is blocked by a solid object. Investigate and find patterns in the way that the size of shadows change. Notice that light is reflected from certain surfaces.	Identify that animals, including humans, cannot make their own food like plants. Humans get nutrition from what they eat. Examine what a balanced diet is using food groups. Examine why humans and some animals need a skeleton and muscles for support, movement & protection. Compare endoskeletons (internal) and exoskeleton (external) - insects.	the functions of different parts of flowering plants. Examine what plants need to grow and survive, whether in an artificial or natural environment. Investigate transpiration. Explore the life cycle of flowering plants: ~pollination ~seed formation ~seed dispersal
Vocab	**Permeable, fossil, sandstone, chalk, limestone, marble, particle, granule, clay, sandy, loam, peat, organic**	**Attracts, magnetism, strength, repel, fair test, change, measure, predict, explain, observations, draw conclusions**	**Light, dark, shadow, mirror, reflect, opaque, transparent, translucent, ray, beam, absorb, luminous, fair test, predict, explain, observations, draw conclusions**	**Survive, nutrition, carbohydrates, protein, fibre, sugar, fat, dairy, skeleton, support, move, vitamins, minerals, investigation, survey, measure, pattern, evidence**	**Stalk, veins, surface, edge, root hair, nutrients, support, germination, seedling, pollination, sepal, carpel, stamen, pollen, reproduce, dispersal, competition, investigation, prediction, explanation, observations**

Suggested Support for children with additional needs.	Specific feedback is given using comments that are positive and explicit. Verbalise with an adult before carrying out the activity.	Peer marking – so that buddies can evaluate each other's work. Simple audio recorders can be used instead of written notes during investigations or field trips.	Offer support in using science equipment that requires a high level of skill or accuracy. Scientific key word cards with visual pictures to make the language of science less challenging.	Allowing pupils time to discuss answers before asking for verbal responses. Make targets clear by teachers talking o pupils about what they are trying to achieve.	Mind- mapping and revisiting mind maps to consolidate learning. Offer support in using science equipment that requires a high level of skill or accuracy.
Step					
1	Initial Knowledge Assessment	Initial Knowledge Assessment	Initial Knowledge Assessment	Initial Knowledge Assessment	Initial Knowledge Assessment
2	Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties.	Investigate different types of forces and understand that a force alters the movement of an object. Investigate which forces make things move or slow things down.	Recognise that light is needed in order to see things and that dark is the absence of light. Compare different materials on the basis of their 'shininess' and relate this to how they reflect the light.	Identify that humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat. Examine food groups: proteins, carbohydrates, fruits and vegetables, fats and sugars, dairy. How do these different foods affect our bodies and keep us healthy or not.	Identify and describe the functions of different parts of flowering plants: roots, stem, leaves and flowers.
3	Identify where and how rocks are used in our local environment. Explain why their properties make them suited to the job.	Explore how moving air can make a windmill move and understand that this is a contact force even though it cannot be seen.	Make reflective strips and explore ways to make it easier to make things (including themselves) be seen in the dark.	Plan a healthy three course school meal using scientific vocabulary to justify your choices.	Examine what plants need in order to survive: Light, air, water, nutrients = LAWN. Plant and care for sunflower seeds. Observe and record their growth and progress.
4	Recognise that soils are formed from broken down rocks. Describe some of the properties of different types of soil.	Develop an understanding of how objects move on different surfaces. Demonstrate how the material affects the way an object moves across it.	Investigate the differences between natural and artificial light. Raise questions about where light sources come from in our everyday lives.	Identify that humans and some animals have skeletons for support, protection and movement. Examine different kinds of skeletons and suggest which animals they belong to. Raise	Investigate the way in which water is transported within plants using carnations and coloured water to show the journey of the water.

				questions about how these animals move. *AF1 Scientific Enquiry Assessment. Questioning – Raise relevant questioning about the world.*	
5	Examine soils and test whether they all let water through at the same rate. Make comparisons and draw conclusions on observations made making links with soil drainage as a problem today.	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.	Recognise that light from the sun can be dangerous and that there are ways to protect the eyes. Plan, test and make a pair of sunglasses. Plan an investigation to test suitable materials for the lenses of sunglasses. Carry out a fair test on different materials to see how good they are at blocking the light. Use evidence for conclusions.	Examine the human skeleton and name some of the key bones in our body: cranium, clavicle, scapula, patella, femur, fibula, tibia, sternum, pelvis.	Dissect a flower in order to make a close observation of the different parts. Label parts of a flower and describe the function of each part.
6	Test the permeability of rocks. Explain which rocks are more porous than others and why this might be useful.	Test different magnets to compare their strength. Understand that the largest magnets are not always the strongest. Use the results of the investigation to support or refute statements. *AF5 Scientific Enquiry Assessment. Reporting on and presenting findings – Collect and record data from observations and tests using scientific language.*	Recognise that shadows are formed when the light from a light source is blocked by a solid object. Children to make real shadows of themselves and other objects, draw the shadows and look for patterns between the object making the shadow and the shadow. Explain what affects the shape of a shadow.	Learn about some of the muscles in the body and how these help to move our skeleton. Identify and name some of the key muscles in our bodies: (biceps, triceps, abdominals, obliques, gluteals, quadriceps and calves.	Insect pollination: understand that pollen needs to be transferred from flower to flower and that bees play a vital role in that process.
7	Describe and name a variety of fossil types. Describe how fossils are formed. Describe in simple terms the stages and timescales involved in the fossilisation process. Link living creatures and plants from the past to the fossils seen today.	Describe magnets as having two poles. Observe how magnets can attract or repel each other and different materials. Predict whether two magnets will attract or repel each other, depending on which poles are facing.	Find patterns in the way that the size of shadows change. Describe the relationship between the relative positions of the object and light source, and the shadow created. *AF4 Scientific Enquiry Assessment. Observing and measuring. Make systematic observations and take accurate measurements using equipment.*	Compare animals that have endoskeletons (internal) with those that have exoskeleton (external) - insects. Investigate how these skeletons affect movement in conjunction with muscles or no muscles.	Investigate the different methods of seed dispersal, how seeds are adapted for them and the reasons why seeds need to be dispersed away from the parent plant.

8	Final Knowledge Assessment	Final Knowledge Assessment	Final Knowledge Assessment	Final Knowledge Assessment	Final Knowledge Assessment

The Science Curriculum for Year 4

	Autumn Term - Romans		Spring Term - Grantham		Summer Term – Anglo-Saxons
Unit	**States of Matter** Examine three main states of matter: solids, liquids and gases Investigate how some materials change state when they are heated or cooled—and at what temperature. Develop scientific vocabulary to describe these changes. Identify these changes of state within the water cycle.	**Animals including Humans** Explore our digestive system and describe its functions. Identify different types of teeth in humans and relate this to carnivores, herbivores and omnivores.	**Electricity** Identify different appliances that use mains/battery electricity. Construct a simple circuit: cells, wires, bulbs, switchers, buzzers. Recognise that a switch opens and closes a circuit. Add a lamp to the circuit and investigate how it can light up. Recognise that metals are good conductors.	***Sound*** *Identify how sounds are produced with vibrations. and that they travel through a medium to the ear.* *Investigate different pitches and volumes of sound and how understand how instruments and strength of vibrations have an effect.* *Experiment with the reflection of sound: echoes*	**Living things and their habitats** Group and sort living things in a variety of ways: invertebrates / vertebrates/ flowering / non flowering plants etc… Using our school wildlife area and environment explore and use classification keys for identification. Using the context of Grantham Canal, examine how a change in environment can pose dangers to living things. Construct a food chain identifying producers, predators and prey.
Vocab	**Solid, liquid, viscous, sticky, grainy, temperature, melting, freezing, solidify, change of state, gas, air, compress, volume,**	**Oesophagus, intestines, rectum, anus, digestion, roughage, vitamins, minerals, mechanical process, saliva, enzyme, canine, molar,**	**Mains, battery power, rechargeable, solar, cell, wire, bulb, buzzer, component, circuit, terminal, switches, conductor, insulator,**	**Vibration, sound source, pitch, particles, question, investigation, fair test, measure, predict, draw conclusions**	**Environment, impact, pollution, biodiversity, derelict, producer, consumer, deforestation, climate change, endangered, conservation, opinion, viewpoint, debate**

	evaporate, steam, condensation, calibrate	**incisor, molar, premolar, predator, prey, carnivore, herbivore, omnivore**	**electron, filament, annotate**			
Suggested Support for children with additional needs.	**Avoid the need for copying unnecessarily – white board notes can be printed off for children.** **Check understanding for assessment purposes by asking them to explain using diagrams or orally.**	**Peer marking – so that buddies can evaluate each other's work.** **Allowing pupils time to discuss answers before asking for verbal responses.**	**Specific feedback is given using comments that are positive and explicit.** **Offer support in using science equipment that requires a high level of skill or accuracy.**	**Consider sound/smell sensitivity by providing low arousal areas.** **Make targets clear by teachers talking o pupils about what they are trying to achieve.**	**Mind- mapping and revisiting mind maps to consolidate learning.** **Verbalise with an adult before carrying out the activity.**	**Simple audio recorders can be used instead of written notes during investigations or field trips.** **Scientific key word cards with visual pictures to make the language of science less challenging.**
Step						
1	Initial Knowledge Assessment	Initial Knowledge Assessment	Initial Knowledge Assessment	Initial Knowledge Assessment	Initial Knowledge Assessment	
2	Explore the properties of solids and liquids, and gases. Use key properties to distinguish between solids and liquids.	Learn about the basic parts of the digestive system and be able to describe the path food takes when we eat it.	Learn about different sources and uses of electricity. Know that electrical items can be powered by mains electricity or batteries and that electricity can be used to produce light, sound, heat and movement.	Investigate how sounds are made. Understand that movements used to make sound can be visible or invisible. Associate some sounds with vibrations.	Group and sort living things in a variety of ways: invertebrates / vertebrates/ flowering / non-flowering plants using simple keys.	
3	Consolidate understanding of the processes of melting and freezing and explore how materials behave when they are heated or cooled at different temperatures.	Learn about how digestion takes place in different parts of the digestive system. Understand that food can be broken down mechanically and chemically and then absorbed into the body. Identify in which organs food is broken down in and what is removed from the food in each organ.	Explore making circuits using different components. Know the names of common components, make and draw complete circuits.	Learn about the basic parts of the ear and understand how sound is captured and processed.	Observe key features of leaves to classify the leaves of a variety of trees in our local environment. Devise a simple classification key to sort leaves.	

4	Condensation: observe and discuss condensation happening in a range of contexts. Recognise where condensation is occurring and annotate a drawing to show changes of state.	Build a physical model of the digestive system using props to represent the different parts of the process.	Understand how electricity flows through components in a complete circuit and apply knowledge to identify and correct circuits which will not work.	Understand that sound needs a medium to travel through. Explore and test how sounds travel through different materials.	Investigate deciduous trees and consider features other than leaves that can be used to classify them: tree shape, type of bark, vein patterns and buds.
5	Evaporation: observe and discuss evaporation happening in a range of contexts. Investigate factors that affect how fast fabric dries. Collect data and record it in a table. *AF6 Scientific Enquiry Assessment. Using evidence for conclusions. Look for changes and patterns in data in order to draw simple conclusions and answer questions.*	Explore the functions of the different types of teeth. Understand that incisors are used for cutting, canines for tearing and molars for grinding.	Explore with switches and lamps. Know that a switch is a controlled break which stops electricity flowing to all parts of the circuit.	Explore different instruments to compare the volume of sound that they produce. Measure the loudness of the sound produced. Explain what makes a sound louder or quieter. *AF3 Planning and performing tests – Recognise when to use fair testing and why it is necessary.*	Consider the impact that humans have on the local environment. Identify positive and negative ways that humans change the environment.
6	Water Cycle incorporating evaporation, condensation and precipitation.	Investigate types of teeth in herbivorous / carnivorous animals. Which do they have more of and why.	Test materials to see whether they are electrical conductors or insulators and record information in tables and diagrams.	Explore different ways to change the pitch of a note produced by a plucked string / elastic band. Understand that the pitch of the note is affected by the length, thickness and tautness of the string / elastic band.	Litter survey in the context of Barrowby Village. Collect and present data about the impact of litter on the environment. Raise relevant questions such as how can we reduce litter and encourage people to dispose of it responsibly. *AF7 Scientific Enquiry Assessment. .Using results* – Identify new questions arising from data, making predictions and improving own enquiries.
7	Final Knowledge Assessment	Final Knowledge Assessment	Final Knowledge Assessment	Understand that echoes are produced when a sound is reflected off a hard surface and that the ear hears the sound after hearing the original sound. Explore echolocation in animals such as bats.	Construct a food chain identifying producers, predators and prey. Examine ways that food chains can be broken if we do not look after our environment and what impact this has.
8				Final Knowledge Assessment	Final Knowledge Assessment

The Science Curriculum for Year 5					
	Autumn Term - Space		**Spring Term - Vikings**	**Summer Term – Leisure & Entertainment**	
Unit	**Earth and Space** Know that the sun is a star and that it has 8 planets. Know the names and order of the 8 planets. Describe the movement of the Earth and other planets relative to the sun. Describe the movement of the moon relative to the earth. Know that the Earth's	**Forces** Investigate the force of gravity Identify the effects of air resistance, water resistance and friction. Explore mechanisms: levers, pulleys, gears	**Properties and changes of Materials** Compare and group materials on the basis of their hardness, solubility, transparency, conductivity and magnetism. Investigate how to make a solution and how mixtures may be separated by filtering, sieving, evaporating. Explore reversible and irreversible changes. Explore chemistry and inspirational chemists such as Spencer Silver (post it note glue) and Ruth Benerito (wrinkle free cotton)	**Animals Including Humans** Describe and recognise changes in growth and development in humans with particular emphasis on puberty.	**Living things & Habitats** Know the characteristics of mammals, amphibians, insects and birds and describe the differences between their life cycles. Using our school vegetable patch and gardens observe the life cycle changes of plants and

	rotation explains day and night.				vegetables. Understand the difference between sexual and asexual reproduction in plants and sexual reproduction in animals. Explore naturalists such as David Attenborough and Jane Goodall.
Vocab	**Planet names, universe, axis, compass, crescent, dawn, dusk, equator, galaxy, hemisphere, illuminate, longitude, lunar month, meridian, nebula, orbit, rotate, solstice, waning**	**Air resistance, Aristotle, balanced, bevel gears, cogs, compress, extend, effort, friction, fulcrum, gravity, Galileo, gears, lever, mechanisms, Newton, newton meter, pinion, pivot, pulley, resistance, weight arm**	**Solid, liquid, gas, compare, contrast, criteria, soluble, insoluble, transparency, rigidity, flexibility, ductile, conductor, insulator, magnetic, viscosity, types of plastics: PVC, polyester, polythene, polystyrene, recycle, reuse, biodegradable**	**Reproduction, fertilisation, sperm, pregnant, birth, menstruation, gestation**	**Life cycle, metamorphosis, mammal, amphibian, insect, bird, hibernate, nocturnal, marsupial, larva, gills, cold blooded, thorax, abdomen, pupa, cocoon, clutch, brood, prey, predator, migration, genetic, endangered, extinction, evolution, sexual, asexual, pollination, propagate**
Suggested Support for children with additional needs.	Use mnemonics to help remember order of things such as planets. Use of ICT to make learning go more efficiently.	Non-reflective interactive whiteboards to reduce glare. Using symbols, images or objects to make learning more accessible.	Consider the accessibility of science demonstrations. Opportunities for re-capping. Use artefacts as a starting point for developing concepts and vocabulary.	Number of goals criteria is kept small and achievable. Print out carpet session mind map for table use.	Interactive displays using key words to make learning accessible and visual. Digital camera to capture each stage of an investigation or important findings on a field visit.
Step					
1	Initial Knowledge Assessment	Initial Knowledge Assessment	Initial Knowledge Assessment	Initial Knowledge Assessment	Initial Knowledge Assessment
2	Know that the sun is a star and that it has eight planets. Learn the names	Explore gravity as a non-contact force. Understand that gravity pulls objects	Compare and group materials. Survey of building materials. Identify how they are being used, noting any signs of wear and tear and suggest ways in which	Life cycle stage of puberty in girls and boys	Sort and group a variety of animals devising own criteria.

	and order of the planets from the sun.	towards the centre of the Earth. Identify how scientific evidence is used to support and refute ideas – Isaac Newton. Measure forces using a Newton meter	insulation and building maintenance might be improved.		*AF2 Identifying and classifying - Use and develop a range of information to identify, classify and describe living things.*
3	Understand what 'a year is and what 'a day is' in relation to Earth's orbit and rotations.	Plan and carry out a fair test investigation into air resistance, using parachutes. *AF5 Reporting on and presenting findings – Decide how to record data and results using relevant language to discuss and communicate ideas and conclusions.*	Test a variety of solids and identify those that dissolve and those that do not.	Identify characteristics of mammals.	Identify characteristics / life cycles of insects, amphibians and birds.
4	Describe the movement of the Earth and other planets relative to the sun.	Explore water resistance and how we can reduce its effects. Investigate how the shape of an object affects its movement through a liquid.	Plan and carry out a comparative test in response to a challenge question: • Does the type of sugar make a difference? • What makes the most difference to the rate at which salt dissolves? • Which dissolves at a faster rate: salt or sugar? Investigate what makes a difference to how rapidly a solid dissolves. Collect evidence systematically in order to answer the questions. *AF4 Observing and Measuring – Make independent decisions about what to measure and observe with precision and accuracy.*	Identify the stages of the human life cycle, including puberty, pregnancy, and gestation.	Using our school vegetable patch and gardens observe the life cycle changes of plants and vegetables. Sexual reproduction: Understand the parts of the flower and their functions in relation to the life cycle of flowering plants. Explore pollination and fertilisation.
5	Examine how space rocks form craters on the surface of the moon when they collide. Plan and perform own crater experiment.	Mechanisms: levers. Investigate levers for moving things and increasing/decreasing a force.	Use knowledge of evaporation and condensation to work out how to get materials back from a solution by investigating a real world problem: how to produce drinkable water from seawater, using limited equipment. Use knowledge of solids and liquids to decide how mixtures might be separated through filtering and sieving.	Compare gestation periods for a variety of mammals. Plot a scatter graph and use it to find a correlation.	Asexual reproduction: know that plants can produce new plants from different parts of the parent plant, rather than by producing seeds. Describe the different methods and suggest the benefits to plants of asexual reproduction.

6	Research how we explored the moon despite its lack of atmosphere and gravity.	Mechanisms: pulleys. Investigate that pulleys make lifting easier by reducing the force needed.	Identify types of changes and group them according to whether they think the change could be reversed or not. Use key vocabulary effectively to communicate scientific understanding of reversible and non-reversible changes.	Final Knowledge Assessment	Explore the life and works of naturalists such as David Attenborough and Jane Goodall. Examine how their work inspires others and impacts the natural world.
7	Know that the Moon's changing appearance over 28 days is evidence of a 28 day orbit - phases of the moon. *(Home Activity: Develop moon diaries and use the evidence recorded over time to explain why it looks like the moon changes shape)*	Mechanisms: gears. Identify where gears are used in everyday life. Understand how gears are used to transfer movement from one place to another / change the speed and direction of movement / convert a small force into a bigger action.	Explore chemistry and inspirational chemists such as Spencer Silver (post it note glue) and Ruth Benerito (wrinkle free cotton)		Final Knowledge Assessment
8	Final Knowledge Assessment	Final Knowledge Assessment	Final Knowledge Assessment		

The Science Curriculum for Year 6

	Autumn Term – WW2		Spring Term – Walk on the Wild Side		Summer Term - London
Unit	**Animals Including Humans** Explore our circulatory system describing the functions of heart, arteries, veins and blood. Understand that our bodies might be damaged through harmful substances. Good lifestyle choices are important for physical and mental wellbeing.	**Light** Explore the way that light behaves (it appears to travel in a straight line) and investigate the relationship between light sources, reflections and shadows.	**Living things and their habitats:** Explore our classification system and that broad groups can be sub-divided. Through observations classify vertebrates and invertebrates. Give reasons for classifying plants and animals based on specific characteristics.	**Evolution and inheritance:** Recognise that fossils provide information about living things millions of years ago. Identify how animals and plants adapt to suit their environments. Explore Charles Darwin's ideas on evolution.	**Electricity** Construct a simple series circuit to help answer questions about what happens when different components are added - switches, bulbs, buzzers and motors. Understand how the amount of voltage used in a circuit affects the brightness of a lamp / volume of a buzzer. Use recognised symbols when representing a simple circuit in a diagram. Design and make a useful circuit that enables a light, buzzer or motor to work.
Vocab	**Aorta, artery, atrium, blood vessel, capillaries, co2, chamber, cells, circulation, de/oxygenated blood, valves, lungs, plasma, platelets, vena cava, ventricle, white/red blood cells**	**Shadow, mirror, reflect, opaque, transparent, translucent, ray, beam, refraction, periscope, spectrum, dispersion, inverted, investigation, fair test, change, measure, hypothesis**	**Population, variation, inheritance, adaptation, generation, survival, natural selection, evolution, genes, DNA, prediction, explanation, observations, draw conclusions**	**Metamorphosis, courtship, plumage, adaptation, fledgling, resident, invertebrate, survival, mammal, amphibian, insect, bird, hibernate, nocturnal, marsupial, larva, gills, cold blooded, thorax, abdomen, pupa, cocoon, clutch, brood, prey, predator, migration, genetic, endangered, extinction, prediction, explanation, observations, justify, analyse**	**Cell, battery, lamp, wire, buzzer, motor, circuit, current, filament, insulator, conductor, terminals, switches: ogle, push, slide, pressure, resistance, resistor, generate, fossil fuels, nuclear, hydroelectric, grid, pylon, transmission, transformer, solar panels**

Suggested Support for children with additional needs.	Consider the accessibility of science demonstrations. Using symbols, images or objects to make learning more accessible.	Non-reflective interactive whiteboards to reduce glare. Use of ICT to make learning go more efficiently.	Number of goals criteria is kept small and achievable. Opportunities for re-capping.	Interactive displays using key words to make learning accessible and visual. Print out carpet session mind map for table use.	Digital camera to capture each stage of an investigation or important findings on a field visit. Make sure children are well prepared for visits via photos/videos.	Use artefacts as a starting point for developing concepts and vocabulary. Make sure science equipment is easily accessible.
Step						
1	Initial Knowledge Assessment	Initial Knowledge Assessment	Initial Knowledge Assessment	Initial Knowledge Assessment	Initial Knowledge Assessment	
2	Systemic Circulation: explore how our circulatory system works and what a 'system' means. Describe the function of blood and blood vessels.	Using mirrors, develop a model of how light travels. Apply this to making a periscope.	Understand the process of a classification system. Devise a classification system for a variety of sweets.	Investigate how animals and plants adapt to their environment – deserts / Arctic / rainforests. Explore how changes in an environment can cause living things to become extinct.	Construct a simple circuit and represent it in a labelled drawing using the correct scientific language and symbols. Explain how terminals are important when constructing a circuit to light a lamp.	
3	Pulmonary Circulation: understand that the human heart is a vital organ. Explore through investigating a pig's heart, how blood flows through its double pumps system to the lungs and all around the body, supplying oxygen and removing waste products.	Explore the refraction of light and give some examples of where it occurs- phenomena of a rainbow.	Investigate in detail the grouping and classification of vertebrates. Understand that broad groups can be sub-divided.	Investigate natural selection and how it could change existing types of living things over very long periods of time.	Investigate switches encountered in everyday life - room light switch, wall socket with switches, table lamp push switch built into the lamp holder. Understand how to control components in a circuit with a switch. Construct a circuit with a switch.	
4	Examine how the different parts of blood enable it to carry oxygen, nutrients and water around the body. Create a Blood Soup fact file.	Plan an experiment with fair tests to investigate how different variables affect the size of a shadow. *AF3 Planning and Performing tests: Understand how to answer scientific enquiries whilst explaining which variables need to be in a controlled test.*	Investigate in detail the grouping and classification of invertebrates. Understand that broad groups can be sub-divided.	Use fossils to examine how plants and animals may have looked in the past and, based on their features, suggest the environment in which they may have lived.	Use the correct scientific language to describe how changing the number and types of components in a circuit affects how they operate. Realise what happens to lamps, buzzers and motors when a resistor changes the flow of electricity in a circuit.	

5	Investigate the effect of exercise on heart rate.	Carry out the experiment to investigate shadow size. Describe the relationship between shape size and the independent variable selected during the planning process.	Examine and investigate the life cycle of micro-organisms.	Research Charles Darwin and his theory of evolution. Justify scientific ideas with evidence.	Circuit diagram Bingo. Analyse and examine different circuits then check that they are correct by building the circuit with the actual components.
6	Investigate and describe the risks posed to health by smoking, alcohol and drug use.	Final Knowledge Assessment	Use grouping and classifying to create a guidebook that explains the key features of the living things in the school grounds. *AF1 Questioning – Use science experiences to raise different kinds of questions.*	Final Knowledge Assessment	Understand how the amount of voltage used in a circuit affects the brightness of a lamp / volume of a buzzer.
7			Investigate the work of Carl Linneas and his classification system that we use today.		Use knowledge of circuits to construct a simple burglar alarm. *AF7 Using results – Use results to make predictions and identify when further observations might be needed.*
8	Final Knowledge Assessment		Final Knowledge Assessment		Final Knowledge Assessment