



# SCIENCE

## KEY STAGE ONE - YEAR A

	AUTUMN 1	AUTUMN 2	SPRING 1
Description	Children will observe and learn about the season, autumn and winter, and the weather associated with them	Children will explore and name everyday objects. They will become familiar with the names and properties of different materials and they will compare and sort them according to their properties.	Children will be able to name and understand the difference between common wild and garden plants. They will know the basic structure of flowering plants. They will learn about what a seed needs to grow,
NC Objectives	<ul style="list-style-type: none"> <li>Observe changes across the four seasons</li> <li>Observe and describe weather associated with the seasons and how the day length varies</li> </ul>	<ul style="list-style-type: none"> <li>Distinguish between an object and the material from which it is made</li> <li>Identify and name a variety of everyday materials</li> <li>Describe the simple physical properties of a variety of everyday materials</li> <li>Compare and group together a variety of everyday materials based on their simple physical properties</li> <li>Identify and compare the suitability of a variety of everyday materials</li> <li>Find out how the shapes of solid objects made from some materials can be changed</li> </ul>	<ul style="list-style-type: none"> <li>Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees</li> <li>Identify and describe the basic structure of a variety of common flowering plants, including trees</li> <li>Observe and describe how seeds and bulbs grow into mature plants</li> <li>Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy</li> </ul>
Substantive Knowledge	<ul style="list-style-type: none"> <li>Children will know the names of each season and when each season occurs</li> <li>They will be able to identify the types of weather that commonly occur during autumn and winter in the UK</li> </ul>	<ul style="list-style-type: none"> <li>Children will know the difference between an object and material</li> <li>They will know the names of common materials</li> <li>They will know the properties of common materials and why they are used to make products</li> </ul>	<ul style="list-style-type: none"> <li>Children will know the difference between wild and garden plants</li> <li>They will be able to identify and name common wild and garden plants and trees</li> <li>They will understand the difference between deciduous and evergreen trees</li> <li>They will be able to identify the parts of a flowering plant and tree</li> </ul>
Disciplinary Skills	<ul style="list-style-type: none"> <li>Children will perform simple test using data loggers to record data on the temperate outside</li> <li>They will use their observations to suggest answers to questions</li> <li>They will record their data in tables</li> </ul>	<ul style="list-style-type: none"> <li>Children will compare and group materials based on their properties</li> <li>They will perform a simple fair test to prove which material is best for a waterproof coat</li> <li>They will record their answers in a table</li> </ul>	<ul style="list-style-type: none"> <li>Children will sort and group plants and trees</li> <li>They will ask simple questions such as 'will the plant grow in ...'</li> <li>They will observe the changes in their seeds as they germinate</li> <li>They will use their observations to answer questions about where seeds will grow best</li> <li>They will record their data in tables</li> </ul>
Vocabulary	summer autumn, winter, spring, day ,daytime, weather, wind, rain, snow, hail, sleet, fog, sub, hot, warm, cold, temperature	object, material, wood, plastic, glass, metal, water, rock, brick, paper, fabric, elastic, foil, hard, soft, stretchy, stiff, shiny, dull, rough, smooth, bendy, not-bendy, waterproof, not waterproof, absorbent, not absorbant	wild, garden, flower, deciduous, evergreen, leaf, root, leaf,flower, stem, trunk, branches, fair test, variable
Assessment	Headstart assessment on seasons	<ul style="list-style-type: none"> <li>Headstart assessment on materials and their properties</li> <li></li> </ul>	Headstart assessment on plants

	SPRING 2	SUMMER 1	SUMMER 2
Description	Children will understand the key differences between types of animals. They will understand the differences between carnivores, herbivores and omnivores and understand that animals have offspring. They will identify and classify different types of animals based on their characteristics and what they eat.	Children will learn the basic parts of the human body and be able to label them. They will learn which body part is associated with each of the five senses.	Children will learn about the importance of exercise and nutrition for humans as well as dental health and hygiene
NC Objectives	<ul style="list-style-type: none"> <li>Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals</li> <li>Identify and name a variety of common animals that are carnivores, herbivores or omnivores</li> <li>Describe and compare the structure of a variety of animals</li> <li>Notice that animals, including humans, have offspring which grow into adults</li> <li>Find out about the basic needs of animals for survival</li> </ul>	<ul style="list-style-type: none"> <li>Identify, name and draw and label the basic parts of the human body and say which part is associated with which sense</li> </ul>	<ul style="list-style-type: none"> <li>Describe the importance for humans of exercise, eating the right amounts of different types of food and hygiene</li> </ul>
Substantive Knowledge	<ul style="list-style-type: none"> <li>Children will identify and name animals from the key groups above</li> <li>They will know the difference in structure of animals</li> <li>They will understand that all animals need food but that they eat different things</li> <li>They will understand that living things have offspring and that humans have babies</li> <li>They will learn that animal offspring differ from human babies</li> <li>They will learn that all living things need the same things to survive but that these look different based on the animal or plant</li> </ul>	<ul style="list-style-type: none"> <li>Children will learn and name the basic parts of the human body</li> <li>They will learn about the five senses and associate body parts to each sense</li> </ul>	<ul style="list-style-type: none"> <li>Children will learn about the importance of health and hygiene and that they need clean bodies, teeth and clothes</li> <li>They will understand what a balanced diet is and that eating the right amounts of food is important</li> </ul>
Disciplinary Skills	<ul style="list-style-type: none"> <li>Children will sort and group animals into fish, amphibians, reptiles, birds and mammals and by carnivore, herbivore or omnivore</li> <li>They will use observation to compare animals based on their structure</li> </ul>	<ul style="list-style-type: none"> <li>Children will use careful observation to answer questions about the sense</li> <li>They will perform simple, practical tests to learn about some of the sense</li> </ul>	<ul style="list-style-type: none"> <li>Children will sort foods into groups</li> <li>They will perform simple, practical tests to learn about the basic effect of exercise on our bodies</li> <li>They will observe closely the changes in their body before and after exercise</li> </ul>
Vocabulary	fish, amphibian, reptile, bird, mammal, carnivore, herbivore, omnivore, offspring, young, survival, needs	hands, feet, arm, legs, fingers, toes, knees, elbows, chest, neck, head, nose, mouth, eyes, ears, skin, taste, touch, sight, smell, hear	Hygiene, healthy, lifestyle, needs, nutrition, exercise
Assessment	Headstart assessment on animals, including humans	Headstart assessment on animals, including humans	Headstart assessment on animals, including humans



# SCIENCE

## KEY STAGE ONE - YEAR B

	AUTUMN 1	AUTUMN 2	SPRING 1
<b>Description</b>	Children will learn about the importance of exercise and nutrition for humans as well as dental health and hygiene	Children learn that living things live in habitats. They will learn about local and micro-habitats	Children will learn about living, dead and never alive
<b>NC Objectives</b>	<ul style="list-style-type: none"> <li>Describe the importance for humans of exercise, eating the right amounts of different types of food and hygiene</li> </ul>	<ul style="list-style-type: none"> <li>Identify that most living things live in habitats to which they are suited and describe how habitats provide for the basic needs of different kinds of animals and plants</li> <li>Identify and names a variety of plants and animals in their habitats</li> </ul>	<ul style="list-style-type: none"> <li>Explore and compare the differences between things that are living, dead and never alive</li> </ul>
<b>Substantive Knowledge</b>	<ul style="list-style-type: none"> <li>Children will learn about the importance of health and hygiene and that they need clean bodies, teeth and clothes</li> <li>They will understand what a balanced diet is and that eating the right amounts of food is important</li> </ul>	<ul style="list-style-type: none"> <li>Children will learn about local habitats (woodland, coastal, pond)</li> <li>They will identify common living things that live in those habitats</li> </ul>	<ul style="list-style-type: none"> <li>Children will learn what makes a living thing</li> <li>They will learn that something can only be dead if it was once alive</li> <li>Children will learn that somethings have never been alive as they have been made</li> </ul>
<b>Disciplinary Skills</b>	<ul style="list-style-type: none"> <li>Children will sort foods into groups</li> <li>They will perform simple, practical tests to learn about the basic effect of exercise on our bodies</li> <li>They will observe closely the changes in their body before and after exercise</li> </ul>	<ul style="list-style-type: none"> <li>Ask and answer questions about living things and their habitats</li> </ul>	<ul style="list-style-type: none"> <li>Children will sort and group things that are living and dead</li> <li>Children will sort and group things that are dead and never alive</li> </ul>
<b>Vocabulary</b>	Hygiene, healthy, lifestyle, needs, nutrition, exercise	habitat, micro-habitat, suitability, adapted	living, dead, never alive, sort and group
<b>Assessment</b>	Headstart assessment on animals, including humans	Headstart assessment on habitats	Headstart assessment on living, dead, never alive

	<b>SPRING 2</b>	<b>SUMMER 1</b>	<b>SUMMER 2</b>
<b>Description</b>	Children will learn how animals obtain their food from plants and other animals	Children will learn about the changes across the seasons, focussing on spring and summer	Children will learn about the weather associated with each of the seasons and how the day length varies across the year
<b>NC Objectives</b>	<ul style="list-style-type: none"> <li>Describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food</li> </ul>	<ul style="list-style-type: none"> <li>Observe changes across the four seasons</li> </ul>	<ul style="list-style-type: none"> <li>Observe changes across the four seasons</li> <li>Observe and describe the weather associated with the seasons and how day length varies</li> </ul>
<b>Substantive Knowledge</b>	<ul style="list-style-type: none"> <li>Children will learn that animals eat different things - carnivores, herbivores and omnivores</li> <li>They will be able to identify predators and prey in food chain as well as consumers and producers</li> </ul>	<ul style="list-style-type: none"> <li>Children will know the names of the four seasons and when they occur in the year</li> <li>They will know the common types of weather associated with each season</li> </ul>	<ul style="list-style-type: none"> <li>Children will know the names of the four seasons and when they occur in the year</li> <li>They will know the common types of weather associated with each season</li> <li>Children will understand that the hours of daylight are less in winter and more in summer</li> <li>Children will learn when which months have the shortest and longest days</li> </ul>
<b>Disciplinary Skills</b>	<ul style="list-style-type: none"> <li>Children will be able to sort and group animals based on what they eat, using scientific vocabulary of carnivore, herbivore and omnivore</li> </ul>	<ul style="list-style-type: none"> <li>Children will use careful observation to answer questions about the seasons</li> </ul>	<ul style="list-style-type: none"> <li>Children will perform simple test using data loggers to record data on the temperate outside</li> <li>They will use their observations to suggest answers to questions</li> <li>They quill record their data in tables</li> </ul>
<b>Vocabulary</b>	food chain, carnivores, herbivores, omnivores, consumer, producer, predator, prey	spring, summer, autumn, winter, seasons, year, months	summer autumn, winter, spring, day ,daytime, weather, wind, rain, snow, hail, sleet, fog, sub, hot, warm, cold, temperature
<b>Assessment</b>	Headstart assessment on food chains	Headstart assessment on seasons	Headstart assessment on seasons



# SCIENCE

## LOWER JUNIORS - YEAR A

	AUTUMN 1	AUTUMN 2	SPRING 1
<b>Description</b>	Children will learn about the different states of matter and how some materials change state when heated or cooled	Children will learn about the different states of matter and how some materials change state when heated or cooled .	Children learn about the importance of light to see and how it is reflected and how shadows are formed.
<b>NC Objectives</b>	<ul style="list-style-type: none"> <li>To compare and group materials together according to whether they are solids, liquids or gases</li> <li>To observe that some materials change state when they are heated or cooled and measure or research the temperature at which this happens in degrees Celsius (°C)</li> <li>Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.</li> </ul>	<ul style="list-style-type: none"> <li>To compare and group materials together according to whether they are solids, liquids or gases</li> <li>To observe that some materials change state when they are heated or cooled and measure or research the temperature at which this happens in degrees Celsius (°C)</li> <li>Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.</li> </ul>	<ul style="list-style-type: none"> <li>Recognise that they need light in order to see things and that dark is the absence of light.</li> <li>Notice that light is reflected from surfaces.</li> <li>Recognise that light from the sun can be dangerous and that there are ways to protect their eyes</li> <li>Recognise that shadows are formed when light from a light source is blocked by an opaque object</li> <li>Find patterns in the way that the size of shadows change.</li> </ul>
<b>Substantive Knowledge</b>	<ul style="list-style-type: none"> <li>To compare and group materials together according to whether they are solids, liquids or gases.</li> <li>To observe that some materials change state when they are heated or cooled and measure or research the temperature at which this happens in degrees Celsius.</li> <li>To identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.</li> </ul>	<ul style="list-style-type: none"> <li>To compare and group materials together according to whether they are solids, liquids or gases.</li> <li>To observe that some materials change state when they are heated or cooled and measure or research the temperature at which this happens in degrees Celsius.</li> <li>To identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.</li> </ul>	<ul style="list-style-type: none"> <li>To recognise they need light in order to see things and that dark is the absence of light.</li> <li>Notice that light is reflected from surfaces.</li> <li>Recognise that light from the sun can be dangerous and that there are ways to protect their eyes</li> <li>Recognise that shadows are formed when light from a light source is blocked by an opaque object</li> </ul>
<b>Disciplinary Skills</b>	<ul style="list-style-type: none"> <li>To ask relevant questions and use different types of scientific enquiries to answer them</li> <li>To set up simple practical enquiries, comparative and fair tests - to explore the effect of temperature on substances</li> <li>To make systematic and careful observations and use a thermometer to measure temperature</li> <li>To gather, record and classify data grouping them into solids, liquids and gases.</li> <li>To record findings using simple scientific language, drawings and labelled diagrams to show solids, liquids and gases) and to use bar charts and tables to show how long it takes an ice cube to melt.</li> <li>To report on findings from enquiries, including oral and written explanations and results table.</li> <li>To use results to draw simple conclusions</li> </ul>	<ul style="list-style-type: none"> <li>To set up a practical enquiry into evaporation and condensation making sure it is a fair test</li> <li>To draw a labelled diagram of enquiry set up</li> </ul>	<ul style="list-style-type: none"> <li>They will ask relevant questions and use different types of scientific enquiries to answer them, e.g. 'What happens to shadows when the light source moves or the distance between the light sources and object changes?</li> <li>Set up simple practical enquiries, comparative and fair tests</li> <li>Take accurate measurements of length of shadows and the distance between the object and light source</li> <li>Gather, record and present data in a table</li> <li>Report on findings through written explanations with results and conclusions</li> <li>Make predictions for unknown values - measure from 10cm, 20cm, 30cm so what do you expect for 100cm?</li> </ul>
<b>Vocabulary</b>	Solid, solidify, ice, melt, freeze, liquid, evaporate, condense, gas, changing state, heated, heat, colled, cool, degrees Celsius (°C), thermometer, water cycle, evaporation, condensation, temperature, melting, melting point, water, water vapour	Solid, solidify, ice, melt, freeze, liquid, evaporate, condense, gas, changing state, heated, heat, colled, cool, degrees Celsius (°C), thermometer, water cycle, evaporation, condensation, temperature, melting, melting point, water, water vapour	Light, light source, dark, reflection, reflect, reflective, ray, shadow, prediction, fair test, variable, anomaly
<b>Assessment</b>	Headstart quiz - States of Matter	Headstart quiz - States of Matter	Headstart assessment on light

	SPRING 2	SUMMER 1	SUMMER 2
Description	To group, compare and describe rocks and soils.	Sound: Children learn about how vibrations cause sound and what pitch and volume are.	Sound: Children learn about how vibrations cause sound and what pitch and volume are.
NC Objectives	<ul style="list-style-type: none"> <li>Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties</li> <li>Describe in simple terms how fossils are formed when things that have lived are trapped within rock</li> <li>Recognise that soils are made from rocks and organic matter.</li> </ul>	<ul style="list-style-type: none"> <li>To identify how sounds are made, associating some of them with something vibrating</li> <li>Recognise that vibrations from sounds travel through a medium to the ear</li> <li>Find patterns between the pitch of a sound and features of the object that produced it</li> <li>Find patterns between the volume of a sound and the strength of the vibrations that produced it</li> <li>Recognise that sounds get fainter as the distance from the sound source increases.</li> </ul>	<ul style="list-style-type: none"> <li>To identify how sounds are made, associating some of them with something vibrating</li> <li>Recognise that vibrations from sounds travel through a medium to the ear</li> <li>Find patterns between the pitch of a sound and features of the object that produced it</li> <li>Find patterns between the volume of a sound and the strength of the vibrations that produced it</li> <li>Recognise that sounds get fainter as the distance from the sound source increases.</li> </ul>
Substantive Knowledge	<ul style="list-style-type: none"> <li>To look at different rocks and note their appearance and simple physical properties.</li> <li>To know and describe how fossils are formed when things that have lived are trapped within rock</li> <li>To recognise that soils are made from rocks and organic matter.</li> </ul>	<ul style="list-style-type: none"> <li>To identify how sounds are made, associating some of them with something vibrating</li> <li>Recognise that vibrations from sounds travel through a medium to the ear</li> <li>Find patterns between the pitch of a sound and features of the object that produced it</li> <li>Find patterns between the volume of a sound and the strength of the vibrations that produced it</li> <li>Recognise that sounds get fainter as the distance from the sound source increases.</li> </ul>	<ul style="list-style-type: none"> <li>To identify how sounds are made, associating some of them with something vibrating</li> <li>Recognise that vibrations from sounds travel through a medium to the ear</li> <li>Find patterns between the pitch of a sound and features of the object that produced it</li> <li>Find patterns between the volume of a sound and the strength of the vibrations that produced it</li> <li>Recognise that sounds get fainter as the distance from the sound source increases.</li> </ul>
Disciplinary Skills	<ul style="list-style-type: none"> <li>To use microscopes to identify and classify rocks according to whether they have grains or crystals.</li> <li>Group and classify rocks based on their appearance and simple physical properties.</li> <li>Explore different local soils and identify similarities and differences between them.</li> <li>Research into how fossils are formed.</li> </ul>	<ul style="list-style-type: none"> <li>Set up simple practical enquiries, comparative and fair test using data loggers to record accurate measurements</li> <li>Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions</li> <li>Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts and tables.</li> <li>Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers.</li> </ul>	<ul style="list-style-type: none"> <li>Set up simple practical enquiries, comparative and fair test using data loggers to record accurate measurements</li> <li>Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions</li> <li>Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts and tables.</li> <li>Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers.</li> </ul>
Vocabulary	Appearance, physical, properties, hard/soft, shiny/dull, rough/smooth, absorbent/not absorbent, fossils, sedimentary, metamorphic, igneous, organic matter, crystals, grains	Vibration, air, ear, hear, sound, volume, pitch, fainter, loud, louder, percussion, string, woodwind, brass, insulate	Vibration, air, ear, hear, sound, volume, pitch, fainter, loud, louder, percussion, string, woodwind, brass, insulate
Assessment	Headstart assessment on rocks	Headstart assessment on sound	Headstart assessment on sound



# SCIENCE

## LOWER JUNIORS - YEAR B

	AUTUMN 1	AUTUMN 2	SPRING 1
<b>Description</b>	Biology - Animals including humans: children learn about nutrition, skeletons, muscles, the digestive system and teeth	Physics - Electricity: the children learn to create simple series circuits and the difference between conductors and insulators	Biology - Living things in their habitats: the children use classification keys to identify living things and learn about the living things in different environments
<b>NC Objectives</b>	<ul style="list-style-type: none"> <li>To identify that animals, including humans, need the right types and amounts of nutrition and that they cannot make their own food.</li> <li>Identify that humans and some other animals have skeletons and muscles for support, protection and movement</li> <li>Describe the simple functions of the basic parts of the digestive system in humans.</li> <li>Identify the different types of teeth in humans and their simple functions.</li> <li>Construct and interpret a variety of food chains, identifying producers, predators and prey.</li> </ul>	<ul style="list-style-type: none"> <li>Identify common appliances that run on electricity</li> <li>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</li> <li>Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit</li> <li>Recognise some common conductors and insulators and associate metals with being good conductors.</li> </ul>	<ul style="list-style-type: none"> <li>Recognise that living things can be grouped in a variety of ways</li> <li>Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment</li> <li>Recognise that environments can change and that this can sometimes pose danger to living things.</li> </ul>
<b>Substantive Knowledge</b>	<ul style="list-style-type: none"> <li>To identify that animals, including humans, need the right types and amounts of nutrition and that they cannot make their own food.</li> <li>Identify that humans and some other animals have skeletons and muscles for support, protection and movement</li> <li>Describe the simple functions of the basic parts of the digestive system in humans.</li> <li>Identify the different types of teeth in humans and their simple functions.</li> <li>Construct and interpret a variety of food chains, identifying producers, predators and prey.</li> </ul>	<ul style="list-style-type: none"> <li>Identify common appliances that run on electricity</li> <li>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</li> <li>Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit</li> <li>Recognise some common conductors and insulators and associate metals with being good conductors.</li> </ul>	<ul style="list-style-type: none"> <li>Recognise that living things can be grouped in a variety of ways</li> <li>Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment</li> <li>Recognise that environments can change and that this can sometimes pose danger to living things.</li> </ul>
<b>Disciplinary Skills</b>	<ul style="list-style-type: none"> <li>Record findings using bar charts to show the amount of fruit consumed or sugar in foods.</li> </ul>	<ul style="list-style-type: none"> <li>Setting up simple practical enquiries, comparative and fair tests (What will happen if I add more light bulbs to my simple circuit)</li> <li>Making systematic and careful observations of the changes to the brightness of the lightbulbs</li> <li>Classifying into conductors or insulators</li> <li>Drawing labelled diagrams of simple electrical circuits</li> <li>Oral report on observations from adding lightbulbs to the simple circuit</li> <li>Using results to raise further questions: what if I added...lightbulbs? What if I add more batteries?</li> </ul>	<ul style="list-style-type: none"> <li>Classifying vertebrates and invertebrates using classification keys and Venn diagrams</li> <li>Use simple scientific language to draw labelled diagrams of vertebrates and invertebrates</li> </ul>
<b>Vocabulary</b>	Food, nutrition, carbohydrates, protein, fats, fibre, water, vitamins, minerals, skeleton, muscle, ligament, tendon, vertebrate, invertebrate, support, protection, movement, digestive system, oesophagus, stomach, liver, producer, predator, prey, food chain, teeth, incisor.	Electricity, plug, wire, circuit, cells, bulbs, switches, buzzers, conductor, insulator, metal, complete, incomplete, loop, battery, series, parallel, circuit, switch	Life processes, living, movement, respiration, sensitivity, growth, respiration, excretion, nutrition, reptile, mammal, amphibian, bird, fish, insect, arachnid, plant, environment, identify, environment, human, deforestation, urbanisation, climate, adapt, danger
<b>Assessment</b>	Headstart assessment on Animals including humans	Headstart quiz on electricity	Headstart quiz on living things in their habitats

	SPRING 2	SUMMER 1	SUMMER 2
<b>Description</b>	Biology - Plants: the children learn about the functions of flowering plants and their requirements for life	Physics - Forces and Magnets: the children explore surfaces and magnetic forces	Physics - Forces and Magnets: the children explore surfaces and magnetic forces
<b>NC Objectives</b>	<ul style="list-style-type: none"> <li>Identify and describe the functions of different flowering plants</li> <li>Explore the requirements of plants for life and growth and how they vary from plant to plant</li> <li>Investigate the way in which water is transported within plants</li> <li>Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal</li> </ul>	<ul style="list-style-type: none"> <li>Compare how things move on different surfaces</li> <li>Notice that some forces need contact between two objects but magnetic forces can act at a distance</li> <li>Observe how magnets attract or repel each other and attract some materials and not others</li> <li>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</li> <li>Describe magnets as having two poles</li> <li>Predict whether two magnets will attract or repel each other, depending on which poles are facing</li> </ul>	<ul style="list-style-type: none"> <li>Compare how things move on different surfaces</li> <li>Notice that some forces need contact between two objects but magnetic forces can act at a distance</li> <li>Observe how magnets attract or repel each other and attract some materials and not others</li> <li>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</li> <li>Describe magnets as having two poles</li> <li>Predict whether two magnets will attract or repel each other, depending on which poles are facing</li> </ul>
<b>Substantive Knowledge</b>	<ul style="list-style-type: none"> <li>Identify and describe the functions of different flowering plants</li> <li>Explore the requirements of plants for life and growth and how they vary from plant to plant</li> <li>Investigate the way in which water is transported within plants</li> <li>Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal</li> </ul>	<ul style="list-style-type: none"> <li>Compare how things move on different surfaces</li> <li>Notice that some forces need contact between two objects but magnetic forces can act at a distance</li> <li>Observe how magnets attract or repel each other and attract some materials and not others</li> <li>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</li> <li>Describe magnets as having two poles</li> <li>Predict whether two magnets will attract or repel each other, depending on which poles are facing</li> </ul>	<ul style="list-style-type: none"> <li>Compare how things move on different surfaces</li> <li>Notice that some forces need contact between two objects but magnetic forces can act at a distance</li> <li>Observe how magnets attract or repel each other and attract some materials and not others</li> <li>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</li> <li>Describe magnets as having two poles</li> <li>Predict whether two magnets will attract or repel each other, depending on which poles are facing</li> </ul>
<b>Disciplinary Skills</b>	<ul style="list-style-type: none"> <li>Ask relevant questions and use types of scientific enquiry to answer them, e.g. How is water transported in plants?</li> <li>Set up simple practical enquiries, comparative and fair tests - water transportation investigation</li> <li>Use simple scientific language, drawings and diagrams to explain water transportation</li> <li>Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions</li> </ul>	<ul style="list-style-type: none"> <li>Set up simple practical enquiries, comparative and fair tests - which everyday objects are magnetic?</li> <li>Sort items into magnetic and non-magnetic in a table</li> <li>Report on findings from magnetic or non-magnetic enquiry - what do you notice?</li> <li>Identify what is similar and different about the magnetic and non-magnetic items</li> <li>Using straight-forward scientific evidence to answer questions and support their findings - do you think...is magnetic? Why/why not?</li> </ul>	<ul style="list-style-type: none"> <li>Set up simple practical enquiries, comparative and fair tests - which everyday objects are magnetic?</li> <li>Sort items into magnetic and non-magnetic in a table</li> <li>Report on findings from magnetic or non-magnetic enquiry - what do you notice?</li> <li>Identify what is similar and different about the magnetic and non-magnetic items</li> <li>Using straight-forward scientific evidence to answer questions and support their findings - do you think...is magnetic? Why/why not?</li> </ul>
<b>Vocabulary</b>	Roots, stem/trunk, leaves, flowers, deciduous, evergreen, blossom, petals, stigma, style, pollen, anther, air, light, water, nutrients, room, pollination, seed formation, seed dispersal, stem, transportation, absorb	Friction, surface, attract, repel, magnetic, force, contact, magnetic, push, pull, pole, North, South, gravity, water resistance, buoyancy	Friction, surface, attract, repel, magnetic, force, contact, magnetic, push, pull, pole, North, South, gravity, water resistance, buoyancy
<b>Assessment</b>	Headstart quiz on plants	Headstart quiz on Forces and Magnets	Headstart quiz on Forces and Magnets



# SCIENCE

## UPPER JUNIORS - YEAR A

	AUTUMN 1	AUTUMN 2	SPRING 1
<b>Description</b>	Children will learn about the properties of light and shadow and conduct their own investigations	Children learn about electricity and explore how circuits work, designing their own lines of investigation	Children learn about different types of forces and use their knowledge to follow their own line of enquiry
<b>NC Objectives</b>	<ul style="list-style-type: none"> <li>Recognise that light appears to travel in straight lines</li> <li>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</li> <li>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</li> <li>Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them</li> </ul>	<ul style="list-style-type: none"> <li>Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit</li> <li>Use recognised symbols when representing a simple circuit in a diagram</li> </ul>	<ul style="list-style-type: none"> <li>Explain that unsupported objects fall towards Earth because of the force of gravity acting between the Earth and falling objects</li> <li>Identify the effects of air resistance, water resistance and friction that act between moving surfaces</li> <li>Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller forces to have a greater effect</li> </ul>
<b>Substantive Knowledge</b>	<ul style="list-style-type: none"> <li>Know that light travels in straight lines.</li> <li>Demonstrate that light reflects off an object into the eye and this is how we see</li> <li>Know what a light source is and give examples</li> <li>Can explain the properties of shadows and how they are formed.</li> </ul>	<ul style="list-style-type: none"> <li>Understand that the number and voltage of cells has an impact on the brightness of the lamp or volume of a buzzer</li> <li>Children can name and draw electrical symbols and use them correctly</li> </ul>	<ul style="list-style-type: none"> <li>Learn about Isaac Newton and describe why objects fall towards Earth (gravity)</li> <li>Describe the effects of air resistance, water resistance and friction that act between moving surfaces</li> <li>Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller forces to have a greater effect</li> </ul>
<b>Disciplinary Skills</b>	<ul style="list-style-type: none"> <li>Plan different types of scientific enquiries to determine the best material for reflecting light</li> <li>Record data and use scientific diagrams and labels to identify the colours of light that make white light</li> <li>Report and present findings from enquiries including conclusions, causal relationships and explanations of a degree of trust in results, in oral and written forms such as displays and other presentations</li> <li>Identify scientific evidence that has been used to support or refute ideas or arguments by looking for patterns in their data</li> </ul>	<ul style="list-style-type: none"> <li>plan a scientific enquiry to investigate the effect of adding more bulbs/cells/motors</li> <li>make observations with increasing accuracy and precision, taking repeat readings where appropriate when exploring whether increasing voltage affects the brightness of a bulb</li> <li>record data and results of increasing complexity using scientific diagrams and labels</li> <li>Use test results to make predictions to set up further comparative and fair tests</li> <li>Report and present findings from enquiries, including conclusions, causal relationships and explanations and a degree of trust in results, in oral and written forms such as displays and other presentations</li> </ul>	<ul style="list-style-type: none"> <li>Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary by comparing friction, water resistance, leavers and pulleys)</li> <li>Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings where appropriate by recording</li> <li>Use test results to make predictions to set up further comparative and fair tests, for example, how a surface or height of a ramp affects the travel of car</li> <li>Report and present findings from enquiries, including conclusions, causal relationships and explanations and a degree of trust in results, in oral and written forms such as displays and other presentations</li> </ul>
<b>Vocabulary</b>	Optics reflection reflective lux luminous reflection refraction angle of incidence	Particles circuit components voltage cell motor	Force motion friction resistance buoyancy newtons streamline
<b>Assessment</b>	Headstart assessment on light	Headstart assessment on electricity	Headstart assessment on forces

	SPRING 2	SUMMER 1	SUMMER 2
Description	Children learn about animals and their habitats, an explore the life cycles of different species	Children learn about the properties of materials and follow their own line of enquiry to investigate	Children learn about the solar system and how celestial bodies relate to each other.
NC Objectives	<ul style="list-style-type: none"> <li>Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird</li> <li>Describe the life process of reproduction in some animals</li> <li>Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms and animals</li> <li>Give reasons for classifying animals based on specific characteristics</li> </ul>	<ul style="list-style-type: none"> <li>Compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity and response to magnets</li> <li>Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating</li> <li>Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic</li> </ul>	<ul style="list-style-type: none"> <li>Describe the movement of the Earth, and other planets, relative to the sun in the solar system</li> <li>Describe the movement of the moon relative to the Earth</li> <li>Describe the sun, Earth and moon as approximately spherical bodies</li> <li>Use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky</li> </ul>
Substantive Knowledge	<ul style="list-style-type: none"> <li>Draw the life cycle of a mammal, an amphibian, an insect and/or a bird</li> <li>Understand the process of reproduction in some animals</li> <li>Group animals according to common observable characteristics and based on similarities and differences, and are introduced to the Latin system of naming</li> <li>Understand the reasons for classifying animals based on specific characteristics</li> </ul>	<ul style="list-style-type: none"> <li>Describe the properties of everyday materials including their hardness, solubility, transparency, conductivity and response to magnets and use this knowledge to sort them in different ways</li> <li>Know the difference between solids, liquids and gases and can make decisions about how mixtures might be separated, including through filtering, sieving and evaporating</li> <li>Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic</li> </ul>	<ul style="list-style-type: none"> <li>Name all of the planets and learn their positions in the solar system</li> <li>Understand the movement of the moon relative to the Earth, through acting out the movement</li> <li>Know that the sun, Earth and moon are approximately spherical</li> <li>Use objects to demonstrate the Earth's rotation to explain day and night and the apparent movement of the sun across the sky</li> </ul>
Disciplinary Skills	<ul style="list-style-type: none"> <li>Plan different types of scientific enquiries to answer questions, for example, do larger mammals live longer than smaller ones</li> <li>Identify scientific evidence that has been used to support or refute ideas or arguments, for example, compare gestation times for mammals and look for patterns, for example, size of animal</li> </ul>	<ul style="list-style-type: none"> <li>Follow a line of enquiry, (for example investigating rates of dissolving) by taking measurements, using a range of scientific equipment, with increasing accuracy and precisions, taking repeat readings where appropriate</li> </ul>	<ul style="list-style-type: none"> <li>Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary, for example, how does the mass of an object affect the size of the crater formed</li> <li>Take measurements, using a range of scientific equipment, with increasing accuracy and precisions, taking repeat readings where appropriate, for example measuring the relative distances of the planets from the sun</li> <li>Record data and results of increasing complexity using scientific diagrams and labels</li> <li>Use test results to make predictions to set up further comparative and fair tests</li> </ul>
Vocabulary	Life cycle classification habitat vertebrate invertebrate	Materials properties synthetic conductivity permeable flammable flexible soluble thermal	Axis eclipse galaxy geocentric heliocentric moon orbit planet rotate satellite solar system star
Assessment	Headstart assessment on living things and their habitats	Headstart assessment on the properties of materials	Headstart assessment on Earth and space



# SCIENCE

## UPPER JUNIORS - YEAR B

	AUTUMN 1	AUTUMN 2	SPRING 1
<b>Description</b>	Children learn about animals including humans	Children learn about the solar system and how celestial bodies relate to each other	Children learn about properties and changes of materials
<b>NC Objectives</b>	<ul style="list-style-type: none"> <li>Describe the changes as humans develop to old age</li> <li>Identify and name the main parts of the human circulatory system and describe the functions of the heart, blood vessels and blood</li> <li>Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function</li> <li>Describe the ways in which nutrients and water are transported within animals, including humans</li> </ul>	<ul style="list-style-type: none"> <li>Describe the movement of the Earth, and other planets, relative to the sun in the solar system</li> <li>Describe the movement of the moon relative to the Earth</li> <li>Describe the sun, Earth and moon as approximately spherical bodies</li> <li>Use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky</li> </ul>	<ul style="list-style-type: none"> <li>Compare and group together everyday materials on the basis of their properties</li> <li>Know that some materials will dissolve in liquid to form a solution and describe how to recover a substance from a solution</li> <li>Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating</li> <li>Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic</li> <li>Demonstrate that dissolving, mixing and changes of state are reversible changes</li> <li>Explain that some changes results in the formation of new materials, and that this kind of change is usually not reversible, including changes associated with burning and the action of acid on bicarbonate of soda</li> </ul>
<b>Substantive Knowledge</b>	<ul style="list-style-type: none"> <li>Describe the changes that humans go through</li> <li>Label diagrams of the main parts of the circulatory system and describe the functions</li> <li>Identify the features of a healthy lifestyle</li> <li>Describe how various systems in their bodies function, including how nutrients and water are transported</li> </ul>	<ul style="list-style-type: none"> <li>Name all of the planets and learn their positions in the solar system</li> <li>Understand the movement of the moon relative to the Earth, through acting out the movement</li> <li>Know that the sun, Earth and moon are approximately spherical</li> <li>Use objects to demonstrate the Earth's rotation to explain day and night and the apparent movement of the sun across the sky</li> </ul>	<ul style="list-style-type: none"> <li>Explore the properties of a range of materials</li> <li>Describe changes and processes e.g. dissolving and evaporating</li> <li>Separate materials using a choice of equipment</li> <li>Explain why we use different materials for different things</li> <li>Know the difference between reversible and irreversible changes and give examples</li> </ul>
<b>Disciplinary Skills</b>	<ul style="list-style-type: none"> <li>Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs</li> <li>Report and present findings from enquiries, including conclusions, causal relationships and explanations and a degree of trust in results, in oral and written forms such as displays and other presentations</li> <li>Identify scientific evidence that has been used to support or refute ideas or arguments</li> </ul>	<ul style="list-style-type: none"> <li>Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary</li> <li>Take measurements, using a range of scientific equipment, with increasing accuracy and precisions, taking repeat readings where appropriate, for example measuring the relative distances of the planets from the sun</li> <li>Record data and results of increasing complexity using scientific diagrams and labels</li> <li>Use test results to make predictions to set up further comparative and fair tests</li> </ul>	<ul style="list-style-type: none"> <li>Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary</li> <li>Identifying scientific evidence that has been used to support or refute ideas or arguments</li> </ul>
<b>Vocabulary</b>	Circulatory system atrium ventricle valves nutrients oxygenated deoxygenated artery vein capillary vessel	Axis eclipse galaxy geocentric heliocentric moon orbit planet rotate satellite solar system star	Materials, properties, synthetic, conductivity, permeable, flammable, flexible, soluble, thermal
<b>Assessment</b>	Headstart assessment on animals including humans	Headstart assessment on Earth and space	Headstart quiz on properties of materials

	SPRING 2	SUMMER 1	SUMMER 2
Description	Children learn about properties and changes of materials	Children learn about evolution and inheritance	Children learn about different types of forces and use their knowledge to follow their own line of enquiry
NC Objectives	<ul style="list-style-type: none"> <li>Compare and group together everyday materials on the basis of their properties</li> <li>Know that some materials will dissolve in liquid to form a solution and describe how to recover a substance</li> <li>Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating</li> <li>Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic</li> <li>Demonstrate that dissolving, mixing and changes of state are reversible changes</li> <li>Explain that some changes results in the formation of new materials, and that this kind of change is usually not reversible, including changes associated with burning and the action of acid on bicarbonate of soda</li> </ul>	<ul style="list-style-type: none"> <li>Recognise that living things have changed over time and that fossils provide information</li> <li>Know about living things that inhabited the Earth millions of years ago</li> <li>Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents</li> <li>Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution</li> </ul>	<ul style="list-style-type: none"> <li>Explain that unsupported objects fall towards Earth because of the force of gravity acting between the Earth and falling objects</li> <li>Identify the effects of air resistance, water resistance and friction that act between moving surfaces</li> <li>Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller forces to have a greater effect</li> </ul>
Substantive Knowledge	<ul style="list-style-type: none"> <li>Explore the properties of a range of materials</li> <li>Describe changes and processes e.g. dissolving and evaporating</li> <li>Separate materials using a choice of equipment</li> <li>Explain why we use different materials for different things</li> <li>Know the difference between reversible and irreversible changes and give examples</li> </ul>	<ul style="list-style-type: none"> <li>Develop an understand about how fossils are formed</li> <li>Name different types of fossils</li> <li>Understand that living things inhabited the Earth millions of years ago</li> <li>Develop an understanding of inherited and learned characteristics</li> <li>Describe how different species are adapted to their environments</li> <li>Explain the difference between adaptation and evolution</li> </ul>	<ul style="list-style-type: none"> <li>Learn about Isaac Newton and describe why objects fall towards Earth (gravity)</li> <li>Describe the effects of air resistance, water resistance and friction that act between moving surfaces</li> <li>Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller forces to have a greater effect</li> </ul>
Disciplinary Skills	<ul style="list-style-type: none"> <li>Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary</li> <li>Identifying scientific evidence that has been used to support or refute ideas or arguments</li> </ul>	<ul style="list-style-type: none"> <li>Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary, for example, which 'beak' has adapted best for which type of bird food</li> <li>Record data and results of increasing complexity using scientific diagrams when comparing the skeletons of different living things</li> </ul>	<ul style="list-style-type: none"> <li>Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary by comparing friction, water resistance, leavers and pulleys)</li> <li>Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings where appropriate by recording</li> <li>Use test results to make predictions to set up further comparative and fair tests,</li> <li>Report and present findings from enquiries, including conclusions, causal relationships and explanations and a degree of trust in results, in oral and written forms such as displays and other presentations</li> </ul>
Vocabulary	Materials, properties, synthetic, conductivity, permeable, flammable, flexible, soluble, thermal	Fossil species inheritance adaptation environment evolution offspring parent	Force motion friction resistance buoyancy newtons streamline
Assessment	Headstart quiz on properties of materials	Headstart quiz on evolution and inheritance	Headstart assessment on forces

