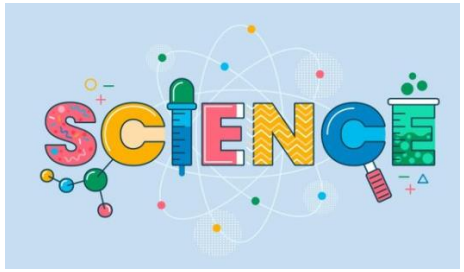
Science At Ashlands



INTENT

At Ashlands Primary School, we believe Science should inspire and excite the children we teach. We encourage them to be inquisitive about the world as they develop the skills they need to work scientifically. Our aim is for the children to become articulate, independent and engaged Science learners as they gather and evaluate evidence in their practical activities.

IMPLEMENTATION

We aim to provide high quality Science lessons which enable the children to explore and understand the world around them. Science is taught as part of our Integrated Curriculum. We use a combination of discreet lessons and a cross-curricular approach, which link to the expectations of the National Curriculum. Science units are taught on a two-year rolling programme enabling teachers to ensure progression between year groups. We make use of the extensive outdoor classroom and gardening areas to support and enhance the children's learning. This provides a wealth of opportunities for them to develop their scientific enquiry skills whilst they observe, develop ideas and ask questions. We believe that the quality and variety of language that pupils hear and speak are key factors in developing their scientific vocabulary and articulating their scientific thoughts clearly and precisely.

Working Scientifically is embedded within the subject content which enables the children to develop a variety of approaches to answer scientific questions. These types of scientific enquiry include:

- Observing over time.
- Pattern seeking.
- Identifying.
- Classifying and grouping.
- Comparative and fair testing.
- Research using secondary sources.

IMPACT

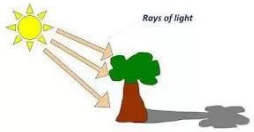
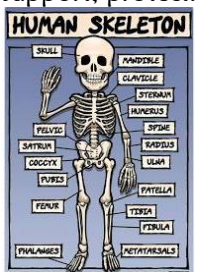
The children at Ashlands are provided with firm foundations and knowledge for understanding the world. Our engagement with the local environment ensures that the children learn through varied and first-hand experiences. They learn from and work with professionals, ensuring access to positive role models within the field of science from the immediate and wider local community. Events such as Science Week enable all children to have opportunities to supplement their learning away from their regular timetable, providing a broader view of Science whilst promoting the acquisition and application of key Science skills.

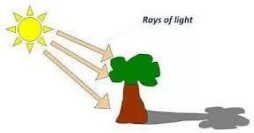
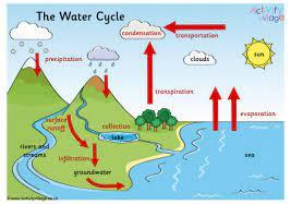
Science Subject Overview						
	AUTUMN 1	**AUTUMN 2**	**SPRING 1**	**SPRING 2**	**SUMMER 1**	**SUMMER 2**
Nursery Characteristics of Effective Learning Underpinning our curriculum	<u>Playing and Exploring</u> Children investigate and experience things and 'have a go'. <u>Active Learning</u> Children concentrate and keep on going even if they encounter difficulties, and enjoy their achievements. <u>Creating and Thinking Critically</u> Children have and develop their own ideas, make links between ideas and develop their strategies for doing things. **Quality interaction with children**					
	Understanding the World I can use all my senses to explore the world – Outdoors: touch, seasonal trays I can explore and compare different materials, e.g. baking, paint mixing, exploring colour I can talk about the things I see around me. I can recognise and talk about the changes I see around me, e.g. light and dark, shadows, seasons (melting) I can talk about myself. I can talk about my family. I can use the things I know about different occupations in my role play. I can explore how different things work – cause and effect toys I can plant a seed and look after it so it grows. I know what living things need to help them grow – hibernation nocturnal animals I can talk about the different forces around me – sinking, floating, gravity. I can see and celebrate my friends' differences. I can say that there are other countries in the world that may be different to where I live.					
Reception Characteristics of Effective Learning Underpinning our curriculum	<u>Playing and Exploring</u> Children investigate and experience things and 'have a go'. <u>Active Learning</u> Children concentrate and keep on going even if they encounter difficulties, and enjoy their achievements. <u>Creating and Thinking Critically</u> Children have and develop their own ideas, make links between ideas and develop their strategies for doing things. **Quality interactions with children** – how do you know? Can you make it stronger? What else could you use?					
	<u>Understanding the World</u> Children need a clear understanding and respect for the place they live, the wider world and the environment. They celebrate similarities and differences between people, culture and communities and find out about lives in the past and compare these to the present. Seasonal changes will continue through the year as we look at the weather and important processes taking place and changes in natural.					
Specific Science concepts	Sequencing activities-baby,	Investigation activities through continuous provision	Investigation activities through continuous provision	Understand the need to respect and care for the	Explore the natural world	Celebrating and reflecting on our journey this year

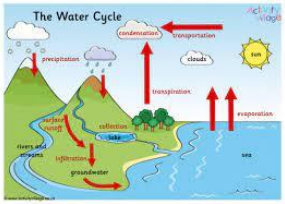
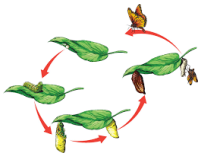
	toddler, school child. How have I changed since I was a baby? Snack - pouring, peeling Outdoors – forest schools, habitats, planting	Visit to the Fire Station People who help us visitors: vet, dentis, police, animal rescue, opticians Water play – measuring jugs, cylinders, funnels. Sand play – texture: wet/fdry Semsroy play – seeds, lentils, cloud dough, cornflour	Construction – large/small blocks, balancing, planning projects, recording observations. D.T link cutting, selecting materials, measuring (tape mesures, rulers)	natural environment and all living things. Conservation. Look at how animals use their environment to protect themselves, stay safe and find food. Focus on David Attenborough and his work with animals. Chicks. lamb visits – link to life cycles. Bees	around us. Seasons Describe what they see, hear and feel outside. Take part in minibeast hunts in our school grounds. See how our bees are helping plants to grow and attract more minibeasts. Plant seeds and care for growing plants. – observational drawings Understand and experience a life cycle for both plants and animals. Take photographs. Understand the need to respect and care for nature.	through Reception and preparing for the change to Year 1. What can you now do that you couldn't last year? What would you tell the new Reception class? Visit to farm. Camping
Year 1	**<u>Animals including humans</u>** Identify, name, draw and label basic parts of the human body and say which part of	**<u>Scientific enquiry from previous learning</u>**	**<u>Everyday Materials</u>** Distinguish between an object and the material from which it is made Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock		**<u>Animals including humans</u>** Identify and name a variety of common animals including fish, amphibians,	**<u>Plants</u>** Identify and name a variety of common wild and garden plants, including

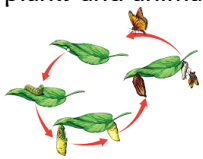
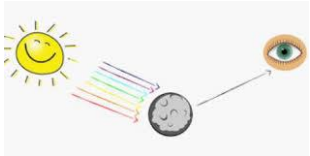
	the body is associated with each sense. 		Describe the simple physical properties of a variety of everyday materials Compare and group together a variety of everyday materials on the basis of their simple physical properties. 	reptiles, birds and mammals Identify and name a variety of common animals that are carnivores, herbivores and omnivores Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets)	deciduous and evergreen trees. Identify and describe the basic structure of a variety of common flowering plants, including trees. 
Year 2 2023-2024	**Animals including humans** Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals Identify and name a variety of common animals that are carnivores, herbivores and omnivores Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and	**Animals including Humans** Notice that animals, including humans, have offspring which grow into adults Find out about and describe the basic needs of animals, including humans, for survival (water, food and air) Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.	**Scientific enquiry linked to previous learning**	**Plants** Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees. Identify and describe the basic structure of a variety of common flowering plants, including trees. 	**Plants** Observe and describe how seeds and bulbs grow into mature plants Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.

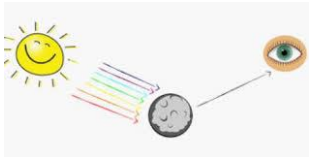
	mammals, including pets) 				
Year 2 2024-2025	**Animals including Humans** Notice that animals, including humans, have offspring which grow into adults Find out about and describe the basic needs of animals, including humans, for survival (water, food and air) Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene. 	**Scientific enquiry linked to previous learning**	**Uses of everyday materials** Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. 	**Plants** Observe and describe how seeds and bulbs grow into mature plants Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.	**All living things and their habitats** Explore and compare the differences between things that are living, dead, and things that have never been alive Identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other Identify and name a variety of plants and animals in their habitats, including micro-habitats 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.

Year3	**Rocks & Soils** Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties Describe in simple terms how fossils are formed when things that have lived are trapped within rock Recognise that soils are made from rocks and organic matter	**Light & Shadow** Recognise that they need light in order to see things and that dark is the absence of light Notice that light is reflected from surfaces Recognise that light from the sun can be dangerous and that there are ways to protect their eyes Recognise that shadows are formed when the light from a light source is blocked by a solid object Find patterns in the way that the size of shadows change. 	**Forces & Magnets** Compare how things move on different surfaces Notice that some forces need contact between two objects, but magnetic forces can act at a distance Observe how magnets attract or repel each other and attract some materials and not others describe magnets as having two poles Predict whether two magnets will attract or repel each other, depending on which poles are facing. Compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials.	**Animals inc humans** Identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat. Identify that humans and some other animals have skeletons and muscles for support, protection and movement.  **Scientific enquiry linked to previous learning**	**How does your garden grow? (Plants)** Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers Explore the requirements of plan for life and growth (air, light, water, nutrient from soil, and room to grow) a how they vary from plant to plant Investigate the way in which water is transported within plants Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.
Year 4 2023-2024	**How does your garden grow? (Plants)** Identify and describe the functions of different parts of	**Light & Shadow** Recognise that they need light in order to see things and that dark is the absence of light	**Forces & Magnets** Compare how things move on different surfaces Notice that some forces need contact between two objects, but	**Sound** Identify how sounds are made, associating some of them with something vibrating	**States of Matter** Compare and group materials together, according to whether they are solids, liquids or gases Observe that some materials change state when they are heated or cooled, and measure or research the	

	flowering plants: roots, stem/trunk, leaves and flowers Explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant Investigate the way in which water is transported within plants Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.	Notice that light is reflected from surfaces Recognise that light from the sun can be dangerous and that there are ways to protect their eyes Recognise that shadows are formed when the light from a light source is blocked by a solid object Find patterns in the way that the size of shadows change. 	magnetic forces can act at a distance Observe how magnets attract or repel each other and attract some materials and not others describe magnets as having two poles Predict whether two magnets will attract or repel each other, depending on which poles are facing. Compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials.	Recognise that vibrations from sounds travel through a medium to the ear Find patterns between the pitch of a sound and features of the object that produced it Find patterns between the volume of a sound and the strength of the vibrations that produced it Recognise that sounds get fainter as the distance from the sound source increases.	temperature at which this happens in degrees Celsius (°C) Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.  **Scientific enquiry linked to previous learning**
Year 4 2024-2025	**Living Things and their Habitats** Recognise that living things can be grouped in a variety of ways Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment Recognise that environments can change and that	**Animals including Humans** Describe the simple functions of the basic parts of the digestive system in humans Identify the different types of teeth in humans and their simple functions Construct and interpret a variety of food chains, identifying producers, predators and prey.	**Electricity** Identify common appliances that run on electricity Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers Identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery	**Sound** Identify how sounds are made, associating some of them with something vibrating Recognise that vibrations from sounds travel through a medium to the ear Find patterns between the pitch of a sound and features of the	**States of Matter** Compare and group materials together, according to whether they are solids, liquids or gases Observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C) Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.

	this can sometimes pose dangers to living things.		Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit Recognise some common conductors and insulators, and associate metals with being good conductors.	object that produced it Find patterns between the volume of a sound and the strength of the vibrations that produced it Recognise that sounds get fainter as the distance from the sound source increases.	 **Scientific enquiry linked to previous learning**	
Year 5	**Forces** Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object Identify the effects of air resistance, water resistance and friction, that act between moving surfaces Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect. 	**Earth and Space** Describe the movement of the Earth, and other planets, relative to the Sun in the solar system Describe the movement of the Moon relative to the Earth Describe the Sun, Earth and Moon as approximately spherical bodies Use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.	**Living Things and their Habitats** Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird Describe the life process of reproduction in some plants and animals. 	**Materials - Properties and changes** Compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic Demonstrate that dissolving, mixing and changes of state are reversible changes Explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated	**Animals, including Humans** Describe the changes as humans develop to old age. **Scientific enquiry linked to previous learning**

				with burning and the action of acid on bicarbonate of soda.	
Year 6 2023-2024	**Forces** Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object Identify the effects of air resistance, water resistance and friction, that act between moving surfaces Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.	**Living Things and their Habitats** Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird Describe the life process of reproduction in some plants and animals.  **Scientific enquiry linked to previous learning**	**Living Things and Their Habitats** Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals Give reasons for classifying plants and animals based on specific characteristics.	**Electricity** Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit. Compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches Use recognised symbols when representing a simple circuit in a diagram.	**Light** Use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye Explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.  **Scientific enquiry linked to previous learning**
Year 6 2024-2025	**Evolution and Inheritance** Recognise that living things have changed over time	**Living Things and Their Habitats** Describe how living things are classified into broad groups	**Animals including Humans** Identify and name the main parts of the human circulatory	**Electricity** Associate the brightness of a lamp or the volume of a	**Light** 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

	and that fossils provide information about living things that inhabited the Earth millions of years ago Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.	according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals Give reasons for classifying plants and animals based on specific characteristics. **Scientific enquiry linked to previous learning**	system, and describe the functions of the heart, blood vessels and blood Describe the ways in which nutrients and water are transported within animals, including humans. Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function. 	buzzer with the number and voltage of cells used in the circuit. Compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches Use recognised symbols when representing a simple circuit in a diagram.	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 Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.  **Scientific enquiry linked to previous learning**