



School: Harlington Lower School
Curriculum Progression for: Science

Intent	To develop in all young people a lifelong curiosity and interest in the sciences. When planning for the science curriculum, we intend for children to have the opportunity, wherever possible, to learn through varied systematic enquiries, leading to them being equipped for life to ask and answer scientific questions about the world around them. As children progress through the year groups, they build on their skills in working scientifically, as well as on their scientific knowledge, as they develop greater independence in planning and carrying out fair and comparative tests to answer a range of scientific questions. The PlanIt Science scheme of work ensures that children have a varied, progressive and well-mapped-out science curriculum that provides the opportunity for progression across the full breadth of the science national curriculum for KS1 and KS2.
EYFS	Children should come to Year 1 with the following skills and knowledge. Communication and Language Listening, Attention and Understanding • Make comments about what they have heard and ask questions to clarify their understanding. Personal, Social and Emotional Development Managing Self • Manage their own basic hygiene and personal needs, including dressing, going to the toilet and understanding the importance of healthy food choices. Understanding the World The Natural World • Explore the natural world around them, making observations and drawing pictures of animals and plants. • Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class. Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.

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	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 1						
Vocabulary	<u>Autumn changes</u> Weather (sunny, rainy, windy, snowy etc.) • Seasons (winter, summer, spring, autumn) • Sun, sunrise, sunset, day length <u>Animals including humans</u> Head, body, eyes, ears, mouth, teeth, leg, tail, wing, claw, fin, scales, feathers, fur, beak, paws, hooves • Names of animals experienced first-hand from each vertebrate group • Parts of the body • Senses – touch, see, smell, taste, hear, fingers (skin), eyes, nose, ear and tongue herbivore, omnivore, carnivore,	<u>Animals including humans</u> As in Autumn 1 <u>Winter changes</u> Weather (sunny, rainy, windy, snowy etc.) • Seasons (winter, summer, spring, autumn) • Sun, sunrise, sunset, day length	<u>Materials</u> Object, material, wood, plastic, glass, metal, water, rock, brick, paper, fabric, elastic, foil, card/cardboard, rubber, wool, clay, hard, soft, stretchy, stiff, bendy, floppy, waterproof, absorbent, breaks/tears, rough, smooth, shiny, dull, see-through, not see-through	<u>Spring changes</u> Weather (sunny, rainy, windy, snowy etc.) • Seasons (winter, summer, spring, autumn) • Sun, sunrise, sunset, day length <u>Plants</u> Leaf, flower, blossom, petal, fruit, berry, root, seed, trunk, branch, stem, bark, stalk, bud Names of trees in the local area Names of garden and wild flowering plants in the local area	<u>Plants</u> As in Spring 2 <u>Summer changes</u> Weather (sunny, rainy, windy, snowy etc.) • Seasons (winter, summer, spring, autumn) • Sun, sunrise, sunset, day length	<u>Scientists and inventors</u> Rainfall, rain, rain gauge, meteorologist, weather, Christopher Wren, Robert Hooke, Richard Towneley, George James Symons. Animals, veterinarian, vet's, poorly, medicine, pet, tail, claws, wing, whiskers, fins. Winter, ear muffs, Chester Greenwood, warm, material, properties. Biologist, Linda Brown Buck, smell, nose, sense, scent.

	mammals, reptiles, birds, fish, amphibians					
Working Scientifically Skills	PLAN - ask simple questions DO - observe closely, using simple equipment (magnifying glass, non-standard units of measure) - perform simple tests in adult led groups - identify, group and classify by their features RECORD - gather and record data to help answer questions - verbally discuss observations and results - write down results in basic written sentences REVIEW - use their observations and ideas to suggest answers to questions					
Knowledge	<u>Seasonal changes (on going topic)</u> In the UK, the day length is longest at mid-summer (about 16 hours) and gets shorter each day until mid-winter (about 8 hours) before getting longer again. The weather also changes with the seasons.	<u>Animals including in humans</u> As in Autumn 1 <u>Seasonal changes (on going topic)</u> In the UK, the day length is longest at mid-summer (about 16 hours) and gets shorter each day until mid-winter (about 8 hours) before getting longer again.	<u>Materials</u> All objects are made of one or more materials. Some objects can be made from different materials e.g. plastic, metal or wooden spoons. Materials can be described by their properties e.g. shiny, stretchy, rough etc.	<u>Seasonal changes (on going topic)</u> In the UK, the day length is longest at mid-summer (about 16 hours) and gets shorter each day until mid-winter (about 8 hours) before getting longer again. The weather also changes with the seasons.	<u>Plants</u> As in Spring 2 <u>Seasonal changes (on going topic)</u> In the UK, the day length is longest at mid-summer (about 16 hours) and gets shorter each day until mid-winter (about 8 hours) before getting longer again.	<u>Scientists and inventors</u> Verbally recall some facts about a range of different scientists and inventors. Know there are many different types of scientists performing different tasks. Understand the impact the inventions and discoveries have had on our world.

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	In the UK, it is usually colder and rainier in winter, and hotter and dryer in the summer. The change in weather causes many other changes. Some examples are: numbers of minibeasts found outside; seed and plant growth; leaves on trees; and type of clothes worn by people. <u>Animals including humans</u> Animals vary in many ways having different structures e.g. wings, tails, ears etc. They also have different skin coverings e.g. scales, feathers, hair. These key features can be used to identify them. Animals eat certain things - some eat	The weather also changes with the seasons. In the UK, it is usually colder and rainier in winter, and hotter and dryer in the summer. The change in weather causes many other changes. Some examples are: numbers of minibeasts found outside; seed and plant growth; leaves on trees; and type of clothes worn by people.	Some materials e.g. plastic can be in different forms with very different properties.	In the UK, it is usually colder and rainier in winter, and hotter and dryer in the summer. The change in weather causes many other changes. Some examples are: numbers of minibeasts found outside; seed and plant growth; leaves on trees; and type of clothes worn by people. <u>Plants</u> Growing locally, there will be a vast array of plants which all have specific names. These can be identified by looking at the key characteristics of the plant. Plants have common parts, but they vary between the different types of plants.	The weather also changes with the seasons. In the UK, it is usually colder and rainier in winter, and hotter and dryer in the summer. The change in weather causes many other changes. Some examples are: numbers of minibeasts found outside; seed and plant growth; leaves on trees; and type of clothes worn by people.	
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	other animals, some eat plants, some eat both plants and animals. Humans have key parts in common, but these vary from person to person. Humans (and other animals) find out about the world using their senses. Humans have five senses – sight, touch, taste, hearing and smelling. These senses are linked to particular parts of the body			Some trees keep their leaves all year while other trees drop their leaves during autumn and grow them again during spring.		
Visit/Special Occasions		Village walk	Science week			Whipsnade zoo trip

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Year 2						
Vocabulary	<u>Animals including humans</u>	<u>The environment</u>	<u>Materials</u>	<u>Living things and their habitats</u>	<u>Plants</u>	<u>Scientists and inventors</u>
	Offspring, reproduction, growth, child, young/old stages (examples - chick/hen, baby/child/adult, caterpillar/butterfly), exercise, heartbeat, breathing, hygiene, germs, disease, food types (examples – meat, fish, vegetables, bread, rice, pasta)	Environment, climate change, atmosphere, greenhouse gases, drought, hurricanes, flooding, sea levels, sea ice, Earth, recycle, reduce, reuse, landfill, incineration, non-renewable resources, renewable resources, fossil fuels, coal, oil, gas, power, electricity, solar, wind, carbon dioxide, pollution, global warming, deforestation, endangered, extinct, water conservation, fresh water, salt water,	Names of materials – wood, metal, plastic, glass, brick, rock, paper, cardboard Properties of materials – as for Year 1 plus opaque, transparent and translucent, reflective, non-reflective, flexible, rigid Shape, push/pushing, pull/pulling, twist/twisting, squash/squashing, bend/bending, stretch/stretching	Living, dead, never been alive, suited, suitable, basic needs, food, food chain, shelter, move, feed Names of local habitats e.g. pond, woodland etc. Names of micro-habitats e.g. under logs, in bushes etc.	light, shade, sun, warm, cool, water, grow, healthy <u>Plus year 1 vocab</u> Plants, leaf, flower, blossom, petal, fruit, berry, root, seed, trunk, branch, stem, bark, stalk, bud Names of trees in the local area Names of garden and wild flowering plants in the local area	Botanist, Jane Colden, plant, leaf, flower, stem, observe, illustrate, sketch. Doctor, Elizabeth Garrett Anderson, surgery, health, exercise, diet, hygiene clean Louis Pasteur, germs, handwashing, illness, disease, Charles MacIntosh, waterproof, fabric, properties,
Working Scientifically Skills	PLAN - ask simple questions - understand they can be answered in different ways DO - observe closely, using simple equipment (rulers, timers, magnifying glass) - perform simple tests in small groups sometimes with an adult - identify, group and classify by their features					

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	RECORD ❖ gather and record data in tables and graphs to help answer questions ❖ verbally discuss observations and results as a class ❖ write down results in written form to help answer questions REVIEW ❖ use their observations and ideas to suggest answers to questions					
Knowledge	Animals, including humans, have offspring which grow into adults. In humans and some animals, these offspring will be young, such as babies or kittens, that grow into adults. In other animals, such as chickens or insects, there may be eggs laid that hatch to young or other stages which then grow to adults. The young of some animals do not look like their parents e.g. tadpoles. All animals, including humans, have the basic needs of	Global warming is caused by an increase of carbon dioxide in the earth's atmosphere. The increase in carbon dioxide has been caused by humans. Humans have a responsibility to reduce carbon dioxide. Suggest ways to reduce, reuse and recycle. Know ways to reduce the use of fossil fuels. Understand what deforestation is and the impact it is having on animals and people living in	All objects are made of one or more materials that are chosen specifically because they have suitable properties for the task. For example, a water bottle is made of plastic because it is transparent allowing you to see the drink inside and waterproof so that it holds the water. When choosing what to make an object from, the properties needed are compared with the properties of the possible materials, identified through simple tests and classifying activities.	All objects are either living, dead or have never been alive. Living things are plants (including seeds) and animals. Dead things include dead animals and plants and parts of plants and animals that are no longer attached e.g. leaves and twigs, shells, fur, hair and feathers (This is a simplification, but appropriate for Year 2 children.) An object made of wood is classed as dead. Objects made of rock, metal and plastic have never been alive (again ignoring that plastics	Plants may grow from either seeds or bulbs. These then germinate and grow into seedlings which then continue to grow into mature plants. These mature plants may have flowers which then develop into seeds, berries, fruits etc. Seeds and bulbs need to be planted outside at particular times of year and they will germinate and grow at different rates. Some plants are better suited to growing in full sun and some grow better in partial or full shade. Plants also need different amounts of	Recall some facts about a range of different scientists and inventors. Understand how doctors use science to perform their jobs. Germs are spread by touching and can lead to people becoming ill. There are many different types of scientists performing different tasks. Understand the impact the inventions and discoveries have had on our world.

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	feeding, drinking and breathing that must be satisfied in order to survive. To grow into healthy adults, they also need the right amounts and types of food and exercise. Good hygiene is also important in preventing infections and illnesses.	this habitat and the wider implications across the world. Understand that water is precious and needs conserving.	A material can be suitable for different purposes and an object can be made of different materials. Objects made of some materials can be changed in shape by bending, stretching, squashing and twisting. For example, clay can be shaped by squashing, stretching, rolling, pressing etc. This can be a property of the material or depend on how the material has been processed e.g. thickness.	are made of fossil fuels). Animals and plants live in a habitat to which they are suited, which means that animals have suitable features that help them move and find food and plants have suitable features that help them to grow well. The habitat provides the basic needs of the animals and plants – shelter, food and water. Within a habitat there are different micro-habitats e.g. in a woodland – in the leaf litter, on the bark of trees, on the leaves. These micro-habitats have different conditions e.g. light or dark, damp or dry. These conditions affect which plants and animals live there.	water and space to grow well and stay healthy.	
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				The plants and animals in a habitat depend on each other for food and shelter etc. The way that animals obtain their food from plants and other animals can be shown in a food chain.		
Visit/Special Occasions		Village walk	Science week			Whipsnade zoo trip

Year 3						
Vocabulary	<u>Forces and magnets</u>	<u>Animals including humans</u>	<u>Rocks and soil</u>	<u>Light</u>	<u>Plants</u>	<u>Scientists and inventors</u>
	Force, push, pull, twist, contact force, non-contact force, magnetic force, magnet, strength, bar magnet, ring magnet, button magnet, horseshoe magnet, attract, repel, magnetic material, metal, iron, steel, poles, north pole, south pole	Nutrition, nutrients, carbohydrates, sugars, protein, vitamins, minerals, fibre, fat, water, skeleton, endoskeleton, exoskeleton, hydrostatic, bones, muscles, support, protect, move, skull, ribs, spine, muscles, joints, tendons,	Rock, stone, pebble, boulder, grain, crystals, layers, hard, soft, texture, absorb water, soil, fossil, marble, chalk, granite, sandstone, slate, soil, peat, sandy/chalk/clay soil, sedimentary, metamorphic, igneous,	Light, light source, dark, absence of light, transparent, translucent, opaque, shiny, matt, surface, shadow, reflect, mirror, sunlight, dangerous	Photosynthesis, pollen, insect/wind pollination, seed formation, seed dispersal (wind dispersal, animal dispersal, water dispersal, flower, stem, leaves, roots, soil, stamen, stigma, ovule, fertilisation	plant, grow, water, light, air, heat, requirements, explore, expedition, botanist. Marie Curie, radiation, element, chemistry, physics, x-ray, bones, support, protection, movement. Agriculture, crops, nutrients, soil, crop rotation, George Washington Carver. Core, seismology, earthquake, magma, molten, liquid, solid, Inge Lehmann.
Working Scientifically Skills	PLAN ❖ Ask relevant questions and conduct enquiries in a range of ways to answer them. ❖ Set up simple practical enquiries, comparative and fair tests in small table groups or pairs. ❖ Set up a fair practical enquiry guided by an adult. DO ❖ make systematic and careful observations ❖ take accurate measurements using standard units, ❖ use a range of equipment, including: tape measures, rulers, timers, RECORD ❖ gather, record, classify and present data in a variety of ways to help in answering questions ❖ record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables REVIEW ❖ Write what I have found out in a report.					

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	❖ Present what I have found to the class ❖ Use the results I have found to draw simple conclusions. ❖ Tell you what is different, what has stayed the same and what has changed in an experiment. ❖ Use the evidence from my own and other people's experiments to support what I have found.					
Knowledge	A force is a push or a pull. When an object moves on a surface, the texture of the surface and the object affect how it moves. It may help the object to move better or it may hinder its movement e.g. ice skater compared to walking on ice in normal shoes. A magnet attracts magnetic material. Iron and nickel and other materials containing these, e.g. stainless steel, are magnetic. The strongest parts of a magnet are the poles. Magnets have two poles	Animals, unlike plants which can make their own food, need to eat in order to get the nutrients they need. Food contains a range of different nutrients – carbohydrates (including sugars), protein, vitamins, minerals, fats, sugars, water – and fibre that are needed by the body to stay healthy. A piece of food will often provide a range of nutrients. Humans, and some other animals, have skeletons and muscles which help them move and provide	Rock is a naturally occurring material. There are different types of rock e.g. sandstone, limestone, slate etc. which have different properties. Rocks can be hard or soft. They have different sizes of grain or crystal. They may absorb water. Rocks can be different shapes and sizes (stones, pebbles, boulders). Soils are made up of pieces of ground down rock which may be mixed with plant and animal	We see objects because our eyes can sense light. Dark is the absence of light. We cannot see anything in complete darkness. Some objects, for example, the sun, light bulbs and candles are sources of light. Objects are easier to see if there is more light. Some surfaces reflect light. Objects are easier to see when there is less light if they are reflective. The light from the sun can damage our eyes	Many plants, but not all, have roots, stems/trunks, leaves and flowers/blossom. The roots absorb water and nutrients from the soil and anchor the plant in place. The stem transports water and nutrients/minerals around the plant and holds the leaves and flowers up in the air to enhance photosynthesis, pollination and seed dispersal. The leaves use sunlight and water to produce the plant's food. Some plants produce flowers which enable the plant to reproduce.	Recall some facts about a range of different scientists and inventors like: Plants can be introduced to new habitats as long as their requirements for growth are met. Marie Curie's work led to the invention of x-ray machines. George Washington Carver invented crop rotation to improve crop yields. Scientists come from all different backgrounds. There are many different types scientists performing different tasks. Scientific thinking can develop lead to new ideas/inventions/discoveries. Understand the impact the inventions and discoveries have had on our world.

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	– a north pole and a south pole. If two like poles, e.g. two north poles, are brought together they will push away from each other – repel. If two unlike poles, e.g. a north and south, are brought together they will pull together – attract. For some forces to act, there must be contact e.g. a hand opening a door, the wind pushing the trees. Some forces can act at a distance e.g. magnetism. The magnet does not need to touch the object that it attracts.	protection and support.	material (organic matter). The type of rock, size of rock pieces and the amount of organic matter affect the property of the soil. Some rocks contain fossils. Fossils were formed millions of years ago. When plants and animals died, they fell to the seabed. They became covered and squashed by other material. Over time the dissolving animal and plant matter is replaced by minerals from the water.	and therefore we should not look directly at the sun and can protect our eyes by wearing sunglasses or sunhats in bright light. Shadows are formed on a surface when an opaque or translucent object is between a light source and the surface and blocks some of the light. The size of the shadow depends on the position of the source, object and surface.	Pollen, which is produced by the male part of the flower, is transferred to the female part of other flowers (pollination). This forms seeds, sometimes contained in berries or fruits which are then dispersed in different ways. Different plants require different conditions for germination and growth.	
Visit/Special Occasions			Science week	Village walk		

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Year 4						
Vocabulary	<u>Animals including humans</u>	<u>Electricity</u>	<u>States of matter</u>	<u>Sound</u>	<u>Living things and their habitats</u>	<u>Scientists and inventors</u>
	Digestive system, digestion, mouth, teeth, saliva, oesophagus, stomach, small intestine, nutrients, large intestine, rectum, anus, teeth, incisor, canine, molar, premolars, herbivore, carnivore, omnivore, producer, predator, prey, food chain	Electricity, electrical appliance/device, mains, plug, electrical circuit, complete circuit, component, cell, battery, positive, negative, connect/connections, loose connection, short circuit, crocodile clip, bulb, switch, buzzer, motor, conductor, insulator, metal, non-metal, symbol	Solid, liquid, gas, state change, melting, freezing, melting point, boiling point, evaporation, temperature, water cycle, precipitation,	Sound, source, vibrate, vibration, travel, pitch (high, low), volume, faint, loud, insulation	Classification, classification keys, environment, habitat, human impact, positive, negative, migrate, hibernate	Sound, transmit, telephone, patent, speech, deaf, Alexander Graham Bell, Electricity, appliance, generate, power, Thomas Edison, Lewis Latimer, lightbulb, carbon filament.
Working Scientifically Skills	PLAN ❖ ask relevant questions and conduct enquiries in a range of ways to answer them. ❖ Independently or in small groups use different types of enquiries to answer questions. DO ❖ make systematic and careful observations ❖ take accurate measurements using standard units, ❖ use a range of equipment, including thermometers, rulers, timers and data loggers RECORD ❖ gather, record, classify and present data clearly in a variety of ways to help in answering questions ❖ record findings using simple scientific language (with increasing confidence), drawings, labelled diagrams, keys, bar charts, and tables REVIEW ❖ Complete a written report, display or presentation to report on findings with increasing use of scientific language. ❖ Deliver an oral report on my findings.					

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- ❖ use results to draw simple conclusions, make predictions for new values,
- ❖ use straightforward scientific evidence to answer questions or to support their findings
- ❖ Evaluate the enquiry and suggest improvements and raise further questions
- ❖ identify differences, similarities or changes related to simple scientific ideas and processes

Knowledge	Food enters the body through the mouth. Digestion starts when the teeth start to break the food down. Saliva is added and the tongue rolls the food into a ball. The food is swallowed and passes down the oesophagus to the stomach. Here the food is broken down further by being churned around and other chemicals are added. The food passes into the small intestine. Here nutrients are removed from the food and leave the	Many household devices and appliances run on electricity. Some plug in to the mains and others run on batteries. An electrical circuit consists of a cell or battery connected to a component using wires. If there is a break in the circuit, a loose connection or a short circuit, the component will not work. A switch can be added to the circuit to turn the component on and off. Metals are good conductors so they	A solid keeps its shape and has a fixed volume. A liquid has a fixed volume but changes in shape to fit the container. A liquid can be poured and keeps a level, horizontal surface. A gas fills all available space; it has no fixed shape or volume. Granular and powdery solids like sand can be confused with liquids because they can be poured, but when poured they form a heap and they do not keep a level surface when tipped.	A sound produces vibrations which travel through a medium from the source to our ears. Different mediums such as solids, liquids and gases can carry sound, but sound cannot travel through a vacuum (an area empty of matter). The vibrations cause parts of our body inside our ears to vibrate, allowing us to hear (sense) the sound. The loudness (volume) of the sound depends on the strength (size) of vibrations which decreases as they travel through the medium. Therefore, sounds decrease in	Living things can be grouped (classified) in different ways according to their features. Classification keys can be used to identify and name living things. Living things live in a habitat which provides an environment to which they are suited (Year 2 learning). These environments may change naturally e.g. through flooding, fire, earthquakes etc. Humans also cause the environment to change. This can be in a good way (i.e. positive human impact, such as setting up nature reserves) or in a bad way (i.e. negative human impact, such as littering).	Recall some facts about a range of different scientists and inventors like: Report on Alexander Graham Bell's life and his invention of the telephone. Explore the impact of electrical inventions by inventors such as Thomas Edison and Lewis Latimer. Scientists come from all different backgrounds. There are many different types scientists performing different tasks. Scientific thinking can develop lead to new ideas/inventions/discoveries. Understand the impact the inventions and discoveries have had on our world.
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digestive system to be used elsewhere in the body. The rest of the food then passes into the large intestine. Here the water is removed for use elsewhere in the body. What is left is then stored in the rectum until it leaves the body through the anus when you go to the toilet. Humans have four types of teeth: incisors for cutting; canines for tearing; and molars and premolars for grinding (chewing). Living things can be classified as producers, predators and prey according to their place in the food chain.	can be used as wires in a circuit. Non-metallic solids are insulators except for graphite (pencil lead). Water, if not completely pure, also conducts electricity	Each individual grain demonstrates the properties of a solid. Melting is a state change from solid to liquid. Freezing is a state change from liquid to solid. The freezing point of water is 0oC. Boiling is a change of state from liquid to gas that happens when a liquid is heated to a specific temperature and bubbles of the gas can be seen in the liquid. Water boils when it is heated to 100oC. Evaporation is the same state change as boiling (liquid to gas), but it happens slowly at lower	volume as you move away from the source. A sound insulator is a material which blocks sound effectively. Pitch is the highness or lowness of a sound and is affected by features of objects producing the sounds. For example, smaller objects usually produce higher pitched sounds.	These environments also change with the seasons; different living things can be found in a habitat at different times of the year.	
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temperatures and only at the surface of the liquid.

Evaporation happens more quickly if the temperature is higher, the liquid is spread out or it is windy.

Condensation is the change back from a gas to a liquid caused by cooling.

Water at the surface of seas, rivers etc. evaporates into water vapour (a gas). This rises, cools and condenses back into a liquid forming clouds. When too much water has condensed, the water droplets in the cloud get too heavy and fall back down as rain, snow, sleet etc. and drain back into rivers etc. This is known as

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			precipitation. This is the water cycle.			
Visit/Special Occasions			Science week	Village walk		