Leamington Hastings C of E Academy
Science / Understanding the World Curriculum

At Leamington Hastings C of E Academy, children begin learning about scientific processes in the Early Years Foundation Stage, as part of Understanding the World. The skills and knowledge learnt are then built upon during the science curriculum in Key Stage One. Children throughout all year groups are provided with the opportunity to work scientifically and are encouraged to develop curiosity about natural phenomena. This might involve making observations over time, looking for patterns, asking and answering questions, making comparisons, carrying out simple comparative tests or identifying, classifying and grouping. Most learning about science will be carried out through the use of first hand practical experiences, but children will also have the opportunity to find things out using secondary sources of information such as books, photographs and videos. Real life images are used wherever possible rather than cartoon or illustrated images. Within science lessons, children will experience a rich spoken vocabulary, being supported to use age appropriate scientific knowledge to articulate scientific concepts clearly and precisely. Children will be supported to make their thinking clear, both to themselves and others, with teachers using questions to probe and remedy misconceptions. As Leamington Hastings Academy contains mixed year groups, children are taught scientific concepts through a two-year rolling program. Although there is a two year rolling program in place in Key Stage One, sometimes the same topic areas are taught in both years (usually those that are listed in both the Year One and Year Two program of study), with other topics taught within one year of the rolling program. In Early Years the concepts are taught each year, with different contexts used on a two yearly rolling program.

Aims

Throughout the Science curriculum children will:

- be provided with first hand experiences to observe the natural and humanly constructed world around them
- gain a secure knowledge of the world around them
- be given the opportunity to be curious; and ask and answer questions about what they notice
- retain knowledge in real life contexts, preparing children for their next stage in education
- be provided with opportunities to work scientifically, exploring lines of enquiry
- be equipped with age appropriate scientific knowledge to understand the uses and implications of science today and for the future
- develop and understand scientific vocabulary

Areas of science taught					
Early Years Foundation Stage:	Plants (taught each year)	Animals including humans (taught each year)	Materials (taught each year)	Seasons (taught each year)	Living things (taught each year)
Key Stage One:	Plants (taught both years)	Animals including humans (taught both years)	Everyday materials (taught both years)	Seasonal change (taught one year)	Living things and their habitats (taught one year)

Whilst children will work scientifically throughout all areas of science and this is **not** taught as a separate strand, the table below includes the specific skills to be introduced in each year group to teach children to use different approaches to answer relevant scientific questions. These will then be revisited over time.

		Nursery Rising 3s	Nursery Pre-School	Reception	Year 1	Year 2
Working Scientifically	**Asking questions**		Ask questions completing a simple sentence stem with scaffolding by an adult.	Ask relevant questions using a sentence stem as part of class discussions.	Independently ask a relevant question using a sentence stem.	Independently ask a relevant question using scientific vocabulary.
	Answering questions	Explore ways to answer questions posed by themselves and adults through first hand experiences with an adult within continuous provision.	Explore ways to answer questions posed by themselves and adults through first hand experiences with some adult scaffolding.	Explore ways to answer questions posed by themselves and adults through first hand experiences as part of class discussions.	Suggest a way that a question might be answered.	Suggest several ways that a question might be answered, including planning a series of steps where appropriate.
					Use first hand and secondary sources of information to find answers to questions posed by themselves and an adult.	Use first hand and secondary sources of information to find answers to questions posed by themselves and an adult.
	Using equipment	Works with an adult to use scientific equipment safely and accurately in small group and induvial tasks in continuous provision.	Follows instructions to use scientific equipment safely and accurately, although may need some support from an adult.	Follows instructions to use scientific equipment safely and accurately.	Knows what scientific equipment tells us e.g. weight and length.	Can independently take measurements using scientific equipment e.g. ruler, timer.
					Can take measurements using scientific equipment with the support of an adult e.g. ruler, pipette.	Can select scientific equipment for a purpose e.g. given a choice of 2 or 3 items selects which would be more appropriate.
	Predications		Say what they think might happen next in discussions with an adult.	Make a simple prediction about what might happen e.g. that plant will grow the tallest.	Make a simple prediction about what might happen, giving a reason e.g. that plant will grow the tallest because it has a larger seed.	Make a simple prediction about what might happen, giving a reason using scientific vocabulary e.g. that plant will grow the quickest because plants need water and we are

						going to water this one more often than the other plants.
	Observing closely	Can verbally describe what they can see with some scaffolding from an adult.	Can verbally describe what they can see.	Can verbally describe what they can see, including observations over time, and is beginning to represent this in pictorial form.	Record what can be seen through lists, words, sentences or pictures, including observations over time.	Use writing and detailed, accurate drawings to demonstrate what is seen, including over time.
					Make descriptive observations using adjectives.	Make descriptive observations using increasingly complex scientific vocabulary
			Can work with an adult to make simple comparative observations between 2 objects through questioning.	Can make simple comparative observations between two objects e.g. taller / shorter.	Make comparative observations of 3 objects.	Make comparative observations of a variety of objects.
					Make numerical observations with the support of an adult.	Make numerical observations.
	Identifying and classifying	In a small group scenario, work with an adult to identify simple obvious features e.g. that horse has 4 legs.	Identify simple features as a species found in the local environment e.g. birds have wings.	Identify simple features to sort and classify e.g. sorting animals into those with 4 legs and those that do not have 4 legs.	Identify features to sort and classify e.g. mammals, replies, amphibians.	Justify the classifications made using scientific knowledge.
	Recording evidence				Use evidence gathered to fill in a simple recording template e.g. list, grid, pictogram or bar chart (one block per unit of data).	Write sentences to demonstrate information gathered, along with filling in prepared tables e.g. tally charts, pictograms, bar charts (one black may signify two, five or ten units of data).

	Presenting finding and drawing conclusions	Can verbally say what has happened, with the support of an adult.		Can verbally explain what they have found out to an adult or other children.	Record findings in simple sentences, lists or labels.	Recording of findings includes scientific vocabulary.
					Can answer the question set by using observations or simple data (see maths grid) to present findings.	Can answer the question set by using observations or year group appropriate data (see maths grid).
					Can use comparative observations to answer questions.	Can use comparative observations to answer questions.
	Sources of information			Looks at pictures or simple diagrams to find out information.	Carries out research using a range of simple secondary sources of information – books, photographs, diagrams etc.	Carries out research using a range of secondary sources of information – books, photographs, diagrams etc.
Plants (KS1 – taught in both cycles)				Name some plants found in the outdoor area. (Plants found in the EYFS outdoor area - daisy, tulip, daffodil, lavender)	Identify and name a variety of common wild and garden plants, including those found in the local environment using first hand experiences. Cycle B nettles, doc leaf and foxgloves. (plants found in the outdoor area - campion, iris, thistles, clover, sweet william, snow drops)	
		Develop a respect for living things by carefully planting, watering and looking after plants they have grown from bulbs or seeds with the support of an adult.	Plant and care for bulbs and plants, making simple observations of changes that take place with the support of an adult.	Explore the world around them, making observations (including the use of magnifying glasses), drawing and labelling pictures of the features seen in simple plants, including those	Explore, make careful observations and ask and answer questions about plants growing in the local environment. Cycle B nettles, doc leaf and foxgloves. (plants found in the outdoor area - campion, iris, thistles, clover, sweet william, snow drops)	

		Cycle A cress and hyacinth Cycle B tulip	found naturally in the environment and those grown. Cycle A cress and hyacinth Cycle B tulip	Observe plants and bulbs (including flowers and vegetables) children have planted as they grow over time, including the use of magnifying glasses, drawings and labels. Cycle B Runner bean and daffodil	Observe and describe how seeds and bulbs grow into mature plants over time, including the use of drawings and descriptions. Cycle B Runner bean and daffodil
				Understand why a tree is classified as deciduous or evergreen. Cycle A Oak, Sycamore, Apple, Willow, Horse Chestnut, Beech, Scots pine, Holly.	
				Identify, name and group/ classify a variety of deciduous and evergreen trees, including first hand experience in the local environment. Cycle A Oak, Sycamore, Apple, Willow, Horse Chestnut, Beech, Scots pine, Holly.	
			Identify and label the basic structure of plants observed using the words: flower, plant, leaf and root.	Identify and label the basic structure of a variety of common flowering plants - including leaves, flowers (blossom), petals, fruit, roots, bulb, seed and stem).	Describe the purpose of the basic structure of a variety of common flowering plants - including leaves, flowers (blossom), petals, fruit, roots, bulb, seed and stem).

				Identify and name the roots, trunk, branches and leaves of a tree.	Describe the purpose of the roots, trunk, branches and leaves of a tree.
	Makes verbal observations about the plants they have grown from bulbs and seeds, and those in the environment, commenting on what they can see.	Makes verbal observations about the plants they have grown, those provided by adults and those in the environment, commenting on what they can see, including noticing some similarities and differences in discussions with adults.	Notice simple similarities and differences in plants e.g. not all plants grow flowers, the leaves on the holly bush are spikier and darker than the leaves on the tree.	Compare and contrast familiar plants, including how they have grown over time, noting a some similarities and differences.	Compare and contrast plants, including how they have grown over times, including classifying by their similarities and differences.
			Discuss how we care for the natural world, including plants e.g. we need to make sure we water them regularly.	Find out and describe how plants need a suitable temperature to grow and stay healthy, carrying out a comparative test including a prediction, test and conclusion. Cycle A tomatoes	
				Find out and describe that seeds and bulbs need water to grow but most do not need light; seeds and bulbs have a store of food inside them. Carry out a comparative test including a prediction, test and conclusion. Cycle B Runner bean and daffodil	

<table>
<tr><td rowspan="4">Animals including humans (taught in both KS1 cycles)</td><td rowspan="3">Name some animals that they are familiar with e.g. pets.</td><td rowspan="3">Name and describe some animals seen in the local environment e.g. horses sheep.</td><td rowspan="3">Name and describe some features of a variety of different animals e.g. frog, worm, bee, horse, sheep, pig, cow.</td><td>Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals, including those kept as pets.</td><td rowspan="3">Sort animals into groups and tables according to their characteristics.</td></tr>
<tr><td>Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals including pets)</td></tr>
<tr><td>Identify and name a variety of common animals that are carnivores, herbivores and omnivores.</td></tr>
<tr><td>Begin to understand the need to respect and care for all living things e.g. we put spiders outside and don’t squash them.</td><td>Help to care for animals, taking part in first hand explorations of animal life cycles.

Cycle A worms
Cycle B frogs</td><td>Discuss how we care for the natural world, including animals e.g. by feeding them and providing them with a place to live. Carry this out in the context of observing a life cycle.

Cycle A worms
Cycle B frogs</td><td colspan="2">Understand how to take care of animals in the local environment, including returning them to their natural habitat after studying them through first hand experience e.g. in the wildlife garden.</td></tr>
<tr><td colspan="3"></td><td>Know that animals produce offspring that grow into adults, ordering the basic stages of their life cycle.</td><td>Know that animals produce offspring that grow into adults, describing the basic stages of the life cycle. Observe</td></tr>
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				Observe through first hand experience. Cycle B Butterflies	through first hand experience. Cycle A Chicks
				Know that animals need food, shelter from weather and predators, water, and a place to raise young.	Describe why animals need food, shelter from weather and predators, water, and a place to raise young.
	Encourage children to talk about what they see, making simple verbal observations describing how animals are different e.g. the chicken has two legs and the cow has four in discussions with an adult.	Begin to notice some similarities and differences in animals in discussions with an adult e.g. the sheep and the cow both have four legs / that horse is brown and that horse is black but they are both horses.	Explore the world around them, making observations and drawing and labelling pictures of the natural world, including animals. Notice some similarities and differences in birds, mini beasts and animals found in the local environment e.g. the robin has a red breast but the blackbird does not.	Compare and contrast animals first hand, or by looking at videos and photographs, grouping them into simple categories determined by the teacher e.g. according to what they eat.	Compare and contrast animals first hand, or by looking at videos and photographs, grouping them into their own categories e.g. according to characteristics of their appearance.
	Sing songs and rhymes with an adult, beginning to learn the basic body parts.		Identify and name the basic parts of the human body – head, hair, eyes, nose, ears, mouth, teeth, arms, hands, fingers, tummy, knees, legs, feet and toes.	Identify, name and label further parts of the human body - neck, chest, wrists, elbows, hips, thigh, shin, ankles, eye lids, nails, shoulders and forehead.	Describe the need for the basic parts of the human body listed in Reception and Year 1.
	Begin to notice differences in humans with the support of an adult e.g. different colours of hair or eyes.		Notice some similarities and differences in humans e.g. height, colour of eyes or length of hair.	Compare and contrast humans first hand, or by looking at videos and photographs, grouping them into simple categories determined	Compare and contrast humans first hand, or by looking at videos and photographs, grouping them into their own categories e.g. according

			by the teacher e.g. according to a physical characteristic.	to characteristics of their appearance.
			Name the 5 senses and know which part of the human body is associated with which sense.	Make comparisons between different textures, sounds and smells using the senses.
			Use senses to explore different textures, sounds and smells.	
			Know that humans produce offspring that grow into adults. Observe through first hand experience, photos or videos.	Name the main stages and characteristics of the human life cycle – baby, toddler, child, teenager, adult. Observe through first hand experience, photos or videos.
		Begin to understand that exercise and hygiene is important for humans e.g. brushing teeth and washing hands.	Know that exercise and hygiene is important for humans e.g. brushing teeth, hand washing and washing.	Suggest ways for a human to stay healthy and hygienic.
		Start to notice some changes that take place in the body when exercising when they are pointed out by an adult.	Independently notices the difference between the body during exercise and at rest.	Can explain what happens to the body when exercising and has a basic understanding of why.
		Begin to identify some foods that are healthy and some that are unhealthy.	Sort foods into healthy and unhealthy foods.	Describe the need to eat the right amounts of different types of food, including sorting foods into different food groups.

Everyday materials (taught in both KS1 cycles)	Explore materials with different properties e.g. a basket of materials with different textures in the environment by shaking, hitting, looking, feeling, turning and poking.	Investigate and make simple comments about properties of natural materials which have similarities and differences e.g. contrasting pieces of bark, different types of leaves, different types of seeds, different types of rocks and different types of pebbles and shells from the beach.	Use the senses of touch, smell and hearing in hands on experiences to investigate a range of different materials, making observations verbally.	Distinguish between and object and the material from which it is made.	Identify and discuss the uses of different everyday materials and know that some materials are used for more than one thing (metal can be used for coins, cans, cars and table legs; wood can be used for matches, floors, and telegraph poles) or different materials are used for the same thing (spoons can be made from plastic, wood, metal, but not normally from glass).
	Explore natural and man made materials indoors and outdoors e.g. wet and dry sand, water, paint, shaving foam and playdough by shaking, hitting, looking, feeling, turning and poking.			Identify and name a variety of everyday materials, including wood, metal, plastic, brick, paper, fabric, elastic, foil, glass, water and rock.	
			Comments on simple properties of materials through first hand exploration and observation e.g. that blanket feels fluffy, the rock feels smooth, the spoon is hard.	Describe the simple physical properties of a variety of everyday materials through first hand exploration and observation and make comparisons: stretchy/stiff: opaque/transparent rough/smooth(cycle B); shiny/dull; hard/soft; bendy/not bendy; waterproof/not waterproof; absorbent/not absorbent (cycle A).	Describe the properties of materials that make them suitable or unsuitable for particular purposes.
			Notice simple similarities and differences in materials, reporting these verbally e.g. the rock and the pebble and both hard	Compare and group together a variety of everyday materials on the basis of their simple properties.	

	Engage in discussions with adults about natural processes e.g. ice melting in the sun, light travelling through a transparent material, objects casting a shadow, material attracting the magnet or an object floating on water.	Begin to make verbal observations about natural processes e.g. ice melting in the sun, light travelling through a transparent material, objects casting a shadow, material attracting the magnet or an object floating on water.	Make observations about natural processes verbally and in pictures e.g. ice melting in the sun, light travelling through a transparent material, objects casting a shadow, material attracting the magnet or an object floating on water.	Ask and answer questions about materials and explore these scientifically e.g. which material is the best to use for an umbrella...for lining a dog basket? ...for curtains? ...for a bookshelf? ...for a gymnast's leotard?' Include a prediction, test and conclusion. Cycle A Umbrella/waterproof property Cycle B Opaque/transparent curtains	
	Begin to understand that there are changes that take place in the world around them, including states of matter, describing changes involving heating and cooling in simple terms e.g. the ice melted in the sun.		Understand that there are changes that take place in the world around them, including states of matter, describing changes involving heating and cooling in simple terms e.g. the ice melted in the sun.	Find out how shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching through first hand observation.	Carry out scientific experiments to explore the effects of squashing, bending, twisting and stretching on different materials, involving predictions, test and conclusion.
			Notice simple similarities and differences when changing state e.g. the smaller ice cube melts quicker than the large ice cube, the butter melts quicker than the chocolate.		
	With the support of an adult, develop verbal observational and investigational skills "I wonder if …" "What will happen if we …"		Make simple predictions and close observations, commenting on what is seen both verbally and in pictures.		
				Find out about a significant person who has developed new materials. Cycle A Summer 2 Macintosh	

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<tr><td></td><td colspan="3"></td><td>Cycle B Autumn 1 Ole Kirk Christiansen</td></tr>
<tr><td></td><td colspan="3"></td><td>Consider unusual and creative uses for everyday materials, hypothesising about how everyday materials may be used in the future.</td></tr>
<tr><td rowspan="6">Seasonal change (taught in cycle A KS1)</td><td rowspan="4">Explore and respond to the natural world through different seasons e.g. splashing in rain puddles, walking through tall grass, looking at blossom growing on trees and noticing trees and flowers.</td><td rowspan="4">Understand that weather changes over time.</td><td rowspan="4">Note and record weather patterns throughout different seasons through drawings. Make simple observations and comment on what is seen both verbally and in pictures.</td><td>Know that there are four seasons and name them, demonstrating the order that they occur.</td></tr>
<tr><td>Observe and describe changes in weather patterns and temperature across the 4 seasons through first hand experience.</td></tr>
<tr><td>Observe and describe weather associated with the seasons and how day length varies through first hand experience.</td></tr>
<tr><td>Notice how plants have changed over time, for example the leaves falling off trees and buds opening depending on the season.</td></tr>
<tr><td>Encourage children to talk about what they see, making simple verbal observations e.g. it’s raining heavily today or the sun is shining brightly.</td><td>Begin to notice some similarities and differences in seasonal patterns with support of an adult e.g. it was raining yesterday but it’s sunny today.</td><td>Notice some similarities and differences in seasonal weather patterns e.g. it rains all year round but not as much in the summer.</td><td rowspan="3">Make tables and charts about the weather, making displays of what is happening around them. These should include day length as the seasons change.</td></tr>
<tr><td colspan="2">Explore and respond to natural materials found in different seasons e.g. conkers, acorns, pine cones, daffodils, sunflowers and holly leaves.</td><td rowspan="2">Explore different seasons outside, observing first hand how plants and animals behave differently as seasons change e.g. lambs only seen in spring, birds migrating for winter, squirrels hibernating for winter, conkers only found in the autumn.</td></tr>
<tr><td colspan="2">Understand that different animals are seen in the environment only at different times of the year and not year round e.g. lambs and robins.</td></tr>
<tr><td>Living things and their habitats</td><td colspan="3"></td><td>Explore and compare the differences between things that are living, dead, and things that have never been alive. Sort and classify using charts and tables.</td></tr>
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(taught cycle B KS1*)*			Know that all living things have certain characteristics that are essential for keeping them alive and healthy, becoming familiar with: movement (all living things move, even plants), respiration (getting energy from food), sensitivity (detecting changes in the surroundings), growth (all living things grow), reproduction (making more living things of the same type), excretion (getting rid of waste) and nutrition (taking in and using food)
	Explore and verbally respond to the natural world by looking for minibeasts and other animals in the environment.	Understand that animals live in homes called habitats – a natural home or environment.	Identify that most living things live in habitats, or microhabitats (a very small habitat such as woodlice under a log or leaf) to which they are suited and explore habitats using first hand experiences.
	Encourage children to talk about what they see, making simple verbal observations e.g. the ladybird is spotty, the slimy worm lives in the ground.		Identify and name a variety of plants and animals in their habitats, including microhabitats, using first hand experiences. Woodlice, ladybirds, bees, frogs, worms, beetles nettles, foxgloves, brambles
			Describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other e.g. plants serving as a source of food and shelter for animals.
			Investigate the different animals that are found in different habitats. Compare animals in familiar habitats with animals found in less familiar habitats, for example, on the seashore, in woodland, in the ocean, in the rainforest.
			Find out and describe how the conditions of a habitat affect the number and type(s) of plants and animals that live there.
			Describe how animals obtain their food from plants and other animals, identifying and naming different sources of food.
			Construct a simple food chain.

		Ask and answer questions about the local environment that help them to identify and study a variety of plants and animals within their habitat and observe how living things depend on each other, for example, plants serving as a source of food and shelter for animals.