

Science coverage whole school skills map by term and year group.

Nursery		
Autumn	Spring	Summer
Use all their senses in hands-on exploration of natural materials.	Use all their senses in hands-on exploration of natural materials.	Use all their senses in hands-on exploration of natural materials.
*Begin to explore the outdoor learning environment, enjoying hands-on activities, such as gardening, climbing the hill and wooden climbing frame, playing in the water area and sand pit. *Begin to use their senses when exploring the learning environment to collect natural materials and use resources, such as magnifying glasses, to help them investigate the natural materials further. *Adults to model investigating materials (I wonder if.) and the children begin to use the skills taught. e.g., during more focused Forest school activities and with the indoor or outdoor learning environments.	*Talk about what they can see, hear, touch and smell when in the indoor learning environment and when outside, beginning to say what is similar about the natural materials and different (shells, stones, seeds etc) *Talk about natural materials, using vocabulary to explain how they feel, smell, look, taste when in the indoor and outdoor environments	*Independently talk about natural materials, using vocabulary to explain how they feel, smell, look, taste when in the indoor and outdoor environments and begin to group them accordingly. *Independently explore and investigate natural materials through play and begin to use the natural objects to create transient art and impressions.
Explore collections of materials with similar and/or different properties	Explore collections of materials with similar and/or different properties	Explore collections of materials with similar and/or different properties
*Engage in collecting natural objects for specific Forest School activities, such as building a nest, collecting resources for transient art etc *Sort different natural objects using the classroom labels eg all the shells in this box when tidying up continuous provision	* Make collections of natural objects for transient art based on instructions eg find all the sticks, stones etc * Look closely and talk about at the differences between objects that are the same eg – this stone is big, this stone is small.	*Observe and talk about what happens to different natural objects in the water tray eg floating and sinking, sponges soaking up water or what can they see in a science tray of natural objects with magnifiers?
Plant seeds and care for growing plants/Understand the key features of the life	Plant seeds and care for growing plants/Understand the key features of the life	Plant seeds and care for growing plants/Understand the key features of the life

cycle of a plant and an animal. /Begin to understand the need to respect and care for the natural environment and all living things.	cycle of a plant and an animal. /Begin to understand the need to respect and care for the natural environment and all living things.	cycle of a plant and an animal. /Begin to understand the need to respect and care for the natural environment and all living things.
*Begin to use their senses to explore the changes Autumn brings to plants e.g., leaves changing colour, falling off the trees and decaying over time * With support, begin to talk about the changes they can see in Autumn *Begin to use their senses to explore the changes Winter/Spring brings to plants e.g., no leaves on the trees and decaying over time *With support, begin to talk about the changes they can see in Winter/Spring	* Through stories and other media resources, begin to understand and talk about simple life cycles of animals such as chicks and butterflies. *Introduce and model vocabulary related to life cycles such as 'blossom' and 'hatch' and beginning to learn the names of baby animals such as chicks, lambs and calves as part of a topic about Spring. *Begin to observe how natural materials decay over time and use simple vocabulary to describe those changes (bread, cheese, wormery, plastic bottle compost) *Help adults plant a variety of seeds/bulbs and talk about what helps them to grow.	*Through stories and other media resources, begin to understand simple life cycles of animals such as chicks and butterflies and complete a simple life cycle. *Independently use vocabulary related to life cycles such as 'blossom' and 'hatch' and beginning to learn the names of baby animals such as chicks, lambs and calves as part of a topic about Spring. *Begin to use their senses to explore the changes Summer brings to plants new growth, flowering etc and talk about the changes they can see in Summer. *Take care of the flowers, plants and vegetables they have planted and talk about how they look after them and what they need to grow.
		Explore and talk about different forces they can feel.
		*Begin to talk about what happens when they feel different forces in their play e.g. pushing a boat down in the water tray in the classroom or water area outside, pushing a tricycle around outside with different numbers of children on it, bending a twig so it snaps, squeezing playdoh with their hands in the dough area.
	Talk about the differences between materials and changes they notice	Talk about the differences between materials and changes they notice
	*Begin to notice and talk about what different materials looks like before and after they have	*Independently notice and use vocabulary to explain how different materials looks like before

	been heated, cooled or put in a different environment, such as water or temperature. *Begin to notice and talk about how different materials behave in different environment or situations, for example light, shadows, sink and float.	and after they have been heated, cooled or put in a different environment, such as water or temperature. *Independently notice and use vocabulary to explain how different materials behave in different environment or situations, for example light, shadows, sink and float.
Reception		
Autumn	Spring	Summer
Explore the natural world around them.	Explore the natural world around them.	Explore the natural world around them.
*Help practitioners care for the garden area by joining in with sweeping the Autumn leaves, watering plants, planting bulbs, vegetables etc caring for the growing area and ensuring all rubbish is put in the bin. *Independently explore the outside learning environment and begin to talk about what they have observed and discovered with the support of an adult. *Independently explore the sand, water, malleable, role-play, small world and construction play, observing and talking about what they can see, hear, smell etc and begin to ask questions.	*Explore the outside learning environment and talk about what they have observed and discovered with their friends and adults. *Independently explore the sand, water, malleable, role-play, small world and construction play, observing and talking about what they can see, hear, smell etc and begin to ask questions, make predicts and problem solve.	*Explore the outside learning environment and ask questions and talk about what they have observed and discovered with their friends and adults. *Carry out an experiment, with the support of the adults, and make predictions and talk about their findings.
Describe what they see, hear and feel whilst outside	Describe what they see, hear and feel whilst outside	Describe what they see, hear and feel whilst outside
*Talk about, with support, animals and plants and use simple adjectives to describe them when in the outside learning environment.	*Independently talk about animals and plants and use simple adjectives to describe them and their habitats.	*Talk about animals and plants and use adjectives to describe them, where they live and begin to draw and label them.

Recognise some environments that are different from the one in which they live.		Recognise some environments that are different from the one in which they live.		Recognise some environments that are different from the one in which they live.	
*Talk about, observe and explore our school community (Autumn walk) and with support, begin to notice natural or man-made features within the environment *Begin to observe and notice natural changes within our environment, such as the weather and say it is Autumn/ Winter and begin to give simple reasons why.		*Talk about, observe and explore our local community of where we live (walk around Harborne) and compare is to our school environment (similarities and differences) and notice natural or man-made features within the environment *Observe and notice natural changes within our environment, such as the weather, and say it is Winter/Spring and gives reasons why, beginning to compare from previous seasons.		*Through a range of media (video, books, visitors, artefact) explore the wider world and make comparisons through talking about similarities and differences of the environment, weather, food, culture etc and say what natural or man-made features they can identify within the environment *Observe and notice natural changes within the environment, such as the weather, and through discussions say it is Spring/Summer and give reasons why, comparing similarities and differences from previous seasons.	
Understand the effect of changing seasons on the natural world around them.		Understand the effect of changing seasons on the natural world around them.		Understand the effect of changing seasons on the natural world around them.	
*With adult support, begin to notice and talk about the weather daily and (record the weather on a chart) discuss whether the weather is the same as yesterday and why. *With support, through discussions and observations the children notice the change of the natural environment i.e., the trees, animals and how we as humans behave in Autumn and Winter.		*Talk about the weather daily and compare the weather in the morning, (record on a chart) to that of the afternoon, discussing whether the weather has changed and give possible reasons as to why. *Through discussions and observations, the children notice the change of the natural environment i.e. the trees, animals and how we as humans behave in Winter to Spring and compare begin those changes.		*Talk about the weather discussing whether the weather has changed over a period of time (week) and give possible reasons as to why, thinking about the season we are currently in. *Through discussions and observations, the children notice the change of the natural environment i.e., the trees, animals and how we as humans behave in Winter to Spring and compare begin those changes.	
Year 1					
Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Animals including humans	Seasonal changes	Materials	Seasonal changes	Plants	Plants

*Observe and identify animals in the world around them. *With a support resource, they sort and classify them into simple groups. *Make careful observations of animals in the same group and can use simple features to compare living things (animals). *Use simple secondary sources to find answers to help them sort and classify animals according to what they eat. *Use their senses to carry out simple practical tests, using simple equipment. After making careful observations, they can draw simple conclusions and can, with support, record and communicate their findings in a range of ways. *Use simple sorting diagrams to sort and	*Observe and describe weather associated with the seasons by observing the weather in autumn. *Gather and record data to help in answering questions by recording the weather, temperature, rainfall and wind direction in autumn. *Observe changes that occur in Autumn compared to the other seasons.	*Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock by matching a material to its name. *Distinguish between an object and the material from which it is made *Describe the simple physical properties of a variety of everyday materials. *Identify which materials have certain properties. *Observe closely, perform a simple test and to use their observations to ask questions. *Compare and group together a variety of everyday materials on the basis of their simple physical properties	*Observe and describe how day length varies in the context of autumn to winter. *Observe changes across the 4 seasons by looking at how trees and the clothes that we wear change from autumn to winter. *Observe and describe weather associated with the seasons by observing and recording the weather in winter. *Gather and record data to help in answering questions by recording the weather, temperature, rainfall and wind direction in winter. *Observe changes across the 4 seasons by exploring how some animals adapt to survive in winter.	*Describe some of the features of seeds and plants. They can begin to make comparisons of different plants and seeds. *Identify, name and begin to describe the basic structure of a variety of common flowering plants. *Identify and name a variety of common wild and garden plants. *Identify and name a variety of deciduous and evergreen trees. They identify, name and describe the basic parts of a tree. *Identify and name a variety of fruit and vegetable plants. They identify and describe the basic structure of a variety of common plants. *Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees.	*Describe some of the features of seeds and plants. They can begin to make comparisons of different plants and seeds. *Identify, name and begin to describe the basic structure of a variety of common flowering plants. *Identify and name a variety of common wild and garden plants. *Identify and name a variety of deciduous and evergreen trees. They identify, name and describe the basic parts of a tree. *Identify and name a variety of fruit and vegetable plants. They identify and describe the basic structure of a variety of common plants. *Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees.
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classify objects (animals) into simple groups of their choice and are beginning to explain why they have sorted them this way.					
Year 2					
Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Animals including humans		Materials		Living Things and their habitats	Plants
*To observe and record the changes in humans as they grow. Question why these changes take place. *To find out about and describe the basic needs of animals, including humans, for survival. *To describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene. *To identify and classify (food groups). *To observe and record (the effects of exercise on the body). *To perform a simple test (hand washing investigation).		*To identify and compare the suitability of a variety of everyday materials for particular uses. *To find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. *To find out about people who have developed useful new materials. *To perform simple tests; To observe things closely, using simple equipment; *Use observations and ideas to suggest answers to questions; *Ask simple questions and recognise that they can be answered in different ways. *To gather and record data to help answer questions. *To identify and classify.		*To explore and compare the differences between things that are living, dead, and things that have never been alive. *To group, identify and classify animals and plants from similar/different habitats. *To identify and name a variety of plants and animals in their habitats, including microhabitats. *To describe how animals obtain their	*To observe and describe how seeds and bulbs grow into mature plants. *To perform a simple test to show the needs of a plant. *To perform simple tests (a test to see what cress seeds need to grow well) *To use observations and ideas to suggest answers to questions. *To gather and record data to help in answering questions.

				food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food. *To observe closely using simple equipment (magnifying glass to look at microhabitats). *To identify and classify (sort plants and animals in to correct habitats).	
Year 3					
Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Animals and humans	Forces and Magnets	Rocks and Fossils		Plants	Light
*To identify that animals, including humans, need the right types and amount of nutrition and recall the five main food groups and list examples. *Ask relevant questions and use different types of scientific enquiries to answer them.	*To investigate how things move differently on different surfaces. * Record findings using simple scientific language, drawings, keys, bar charts and tables. – e.g. time taken to move across surfaces, the strength of magnets	*To compare and group together different kinds of rocks on the basis of their appearance and simple physical properties. To explain how fossils are formed when things that have lived are trapped within rock. *To identify and describe the three different rock types and list examples. *Ask relevant questions and using different types of scientific enquiries to answer them. * Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions.		*To identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers *To know, by investigating, the way in which water is transported within plants	*Ask relevant questions and use different types of scientific enquiries to answer them. * Setup simple practical enquiries, comparative and fair tests to show that light is reflected off surfaces and how shadows are formed.

*Set up simple practical enquiries, comparative and fair tests. * Pupils should read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge.	* To investigate how magnets attract or repel each other and attract some materials and not others. * Pupils should read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge.	*Use straightforward scientific evidence to answer questions or to support their findings. *Set up simple practical enquiries, comparative and fair tests. * Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables. *Gather, record, classify and present data in a variety of ways to help in answering questions. *Compare and group rocks based on their appearance, properties or uses. *Describe simply how fossils are formed, using words, pictures or a model.	*Ask relevant questions and use different types of scientific enquiries to answer them. * Setup simple practical enquiries, comparative and fair tests based on 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. * Make systematic and careful observations and, where appropriate, take accurate measurements using standard units, use a range of equipment, including thermometers and data loggers. *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.	*Make systematic and careful observations and, where appropriate, take accurate measurements using standard units, use a range of equipment, including thermometers and data loggers. *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.
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Year 4					
Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Electricity	States of Matter	States of matter	Living things and their habitats	Animals including humans	Sound
*Construct a simple series circuit. *Identify whether 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. *Make predictions and suggest improvements to their circuit. *Test circuits with a variety of possible conductors and present findings and conclusions using labelled diagrams.	*Compare and group materials together according to whether they are solids, liquids or gases. *Explore how materials change state when they are heated or cooled. *Measure or research the temperature at which this change happens. *Set up a simple practical enquiry to test what happens to water at various temperatures. *Present findings using scientific vocabulary, in a variety of ways.		*Recognise that living things can be grouped in a variety of ways. *Classify and group them by chosen criteria. *Explore plants and animals living in the local area and present information using a key. *Use secondary sources to aid identification. *Research and identify environmental dangers and their effects upon animal and plant life. *Set up a simple test to gain evidence and to support findings. - Suggest possible solutions.	*Record the functions of the digestive system using labelled diagrams. *Draw and label the different types of human teeth. *Use secondary sources to identify predators and their prey. *Construct a variety of food chains.	*To explore how sounds are made. *Identify patterns between volume, strength and distance through comparative and fair tests. *Make predictions and present conclusions using scientific language.
Year 5					
Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2

Earth and Space	Properties of materials	Living things and their habitats	Living things and their habitats	Forces	Animals including humans
*To raise scientific questions *To draw scientific diagrams/simple models of the solar system with labels and keys. * To compare the time of day through internet links.	* To describe and report changes of state using scientific language *To observe changes over time e.g. using ice to explore thermal conductors/ insulators * To test and group materials (wood, metal and plastic) based on scientific evidence (hardness/solubility) *To recover a substance from a solution (salt)	* Compare the life cycles of a mammal, an amphibian, an insect and a bird. *To observe changes over time (plants in a local environment and animals). *Describe the life process of a-sexual and sexual reproduction in some plants. *Describe the process of sexual reproduction in animals *Grow new plants from different parts of the parent plant, for example, seeds, stem and root cuttings, tubers, bulbs. *To label, draw and dissect a flower. *Study the work of an animal behaviourist – David Attenborough.		*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.	*Describe the changes as humans develop to old age
Year 6					
Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Animals including humans	electricity	Living things and their habitats	Living things and their habitats	Evolution and inheritance	Light
*Explain that the circulatory system in animals transports oxygen, water and	*Plan different kinds of fair experiments. *Recognise why controlling variables is	*Classify living things, including microorganisms, animals and plants, into groups according to common observable characteristics and based on similarities and differences.		*Discuss inherited features, making a list in science books.	Children choose one of the following questions to investigate:

nutrients around the body. *Explain the impact of positive and negative lifestyle choices on the body. *Name and describe the purpose of the circulatory system and the functions of the heart, blood vessels and blood.	important and explain how and why. *Take repeated measurements when appropriate. *Draw conclusions from results and describe causal relationships. *Compare and give reasons for variations in how components function in circuits. *Use evidence to justify ideas. *Use scientific language and diagrams to report and present findings.	*Identify how animals and plants are adapted to suit their environment, such as giraffes having long necks for feeding, and that adaptations may lead to evolution. *Plan and carry out a range of enquiries, including writing methods, identifying and controlling variables, deciding on equipment and data to collect and making predictions based on prior knowledge and understanding. *Research unfamiliar animals and plants from a range of habitats, deciding upon and explaining where they belong in the classification system. *Use and construct classification systems to identify animals and plants from a range of habitats.	*Children generate a testable hypothesis they can investigate as a class, such as 'Females are taller than males', 'Brown-eyed children also have brown hair' or 'People with larger hand spans also have larger feet'. *Children collect data by taking accurate, precise and repeated measurements in standard units, using a range of chosen equipment. *Children display their data using graphs and charts to identify if their hypothesis was correct. (Discuss the different graphing methods they could use, such as bar charts for discontinuous variation, line graphs for continuous variation or scatter graphs for looking for a correlation between two data sets.) *Children discuss their results and whether it	*How much light passes through a range of transparent and translucent materials? *How much light is absorbed by different materials? *Do all shiny materials reflect light? *Does crumpled foil reflect as much light as flat foil? *Which fabric would be the best to use to make a pair of curtains? *When does a material become opaque? *Is any material totally transparent? *Children design the method and list equipment needed for the experiment. *Children follow method and take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.
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			proves or disproves their hypothesis then write a short scientific report, including their original hypothesis, results, graphs and a conclusion	*Children display their data appropriately. Give time for them to interrogate their data, seek out patterns and answer their question.
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