Learning Together, Learning for Life

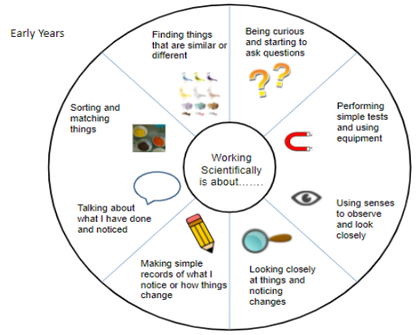
Curriculum Map for Science

Early Years

To support our play based learning in Early Years, our skilled Early Years teachers will identify and plan opportunities for all children to develop key knowledge and skills which will support them in successfully accessing the National Curriculum for Science when they enter Year One. Using the Key Stage One programmes of study of: investigative skills, living things and their habitats, plants, animals including humans, everyday materials and seasonal changes; the key skills and knowledge are identified below:

Working scientifically:

- Being curious and starting to ask questions
- Performing simple tests and using equipment
- Using senses to observe and look closely
- Looking closely at things and noticing changes
- Making simple notes of what I notice or how things change
- Talk about what I have done and noticed
- Sorting and matching things
- Finding things that are similar and different
- Being curious and starting to ask questions



Living things and their habitats

Understanding the World:
Begin to understand the need to respect and care for the natural environment and all living things.
They explore the natural world around them
They describe what they see, hear and feel while outside.
Talk about what they see, using a wide vocabulary.

Vocabulary:
Grow, growing, growth, tall, height, weight, length, baby, child, teenager, adult, elderly, life cycle, tadpole, froglet, frog, eggs, butterfly, caterpillar, see, hear, smell, touch, taste, senses

The Natural World ELG:
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.

Plants

Understanding the World:
Plant seeds and care for growing plants.
Understand the key features of the life cycle of a plant.
Begin to understand the need to respect and care for the natural environment and all living things.
Explore the natural world around them
Describe what they see, hear and feel while outside.
Talk about what they see, using a wide vocabulary.

Vocabulary:
Garden, tree, flower, stem, petal, leaf, roots, water, light, grow, seed, bulb, blossom, trunk, branch, bark, sunflower, daffodil, daisy, poppy, shade, sun, warm, cool, spring, summer, autumn, winter

The Natural World ELG:
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.

Seasonal Changes

Understanding the World:
Understand the effect of changing seasons on the natural world around them.
Describe what they see, hear and feel whilst outside.
Explore the natural world around them.
Talk about what they see, using a wide vocabulary.

The Natural World ELG:
Explore the natural world around them.
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.

Animals including humans

Understanding the World:
Understand the key features of the life cycle of an animal.
Understand the need to respect and care for the natural environment and all living things.
Explore the natural world around them
Describe what they see, hear and feel while outside.
Talk about what they see, using a wide vocabulary.

Personal, Social and Emotional Development:

Everyday Materials

Understanding the World:
Explore collections of materials with similar and/or different properties.
They can talk about the difference between materials and changes they notice.
They use all their senses in hands-on exploration of natural materials.
They explore collections of materials with similar and/or different properties.
They talk about what they see, using a wide range of vocabulary.
Expressive Arts and Design:
Explore different materials freely, to develop their ideas about how to use them and what to make.

Be increasingly independent in meeting their own care needs, e.g., brushing teeth, using the toilet, washing and drying their hands thoroughly. Make healthy choices about food, drink, activity and tooth brushing. **Vocabulary:** Grow, growing, growth, tall, height, weight, length, baby, child, teenager, adult, elderly, life cycle, tadpole, froglet, frog, eggs, butterfly, caterpillar, see, hear, smell, touch, taste, senses, healthy **The Natural World ELG:** 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. **Managing Self ELG:** Manage their own basic hygiene and personal needs, understanding the importance of healthy food choices.	Develop their own ideas and then decide which materials to use to express them. Join different materials and explore different textures. **Vocabulary:** clear, see through, hard, soft, shiny, smooth, rough, prickly, bumpy, wood, plastic, metal, glass, fabric, hot, cold, wet, dry, melt, freeze **The Natural World ELG:** Explore the natural world around them. 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. Creating with Materials ELG: Safely use and explore a variety of materials.

Key Stage One

Our Key Stage One curriculum follows the National Curriculum. Using The Association for Science Education, we have identified the key skills and knowledge we ensure our pupils reach by the end of Key Stage One in order to access the Key Stage 2 curriculum when they move into Year 3.

Year One end points

Year Two end points.

Each lesson sees at least one focus on working scientifically:

- Asking questions
- Performing simple tests and using equipment
- Saying why a test is fair
- Observing and measuring
- Using books, videos, the internet, people and photos to find answers
- Recording information
- Looking for patterns – sorting and grouping
- Explaining results – saying what we have found

	Autumn	Spring	Summer
Year A	**Animals including humans** Identify and name a variety of common animals. They should be able to recognise what group an animal belongs to. (Y2 to also recognise the differences between the different groups of animals). Identify and name animals that are carnivores, herbivores and omnivores and discuss what different animals eat (Y2 to begin to know the differences between carnivores, herbivores and omnivores). Notice that animals, including humans, have offspring which grow into adults. Children can discuss the names of adult animals and their young (Y2 to explain what happens to a human and an animal as they grow). Research using leaflets, visitors or the internet the basic needs of animals, including humans for survival (water, food and air) and record what they have found out (describe). (Y2 to present findings to the class through a presentation/report). Explain the importance of exercise, eating the right amounts of different types of food, and hygiene (humans). Perform a 'exercise activity' and discuss what they notice about their bodies. (Y2 to find out through	**Plants** Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees through fieldwork. (Y2 to explain the difference between a deciduous and evergreen tree). Identify and describe the basic structure of a variety of common flowering plants, including trees. Use key vocabulary like stem, trunk, petals. (Y2 to discuss differences between different plants and trees). Observe how seeds and bulbs grow into mature plants through growing their own plants. Record results (measuring) on a pre-made table. Describe how seeds and bulbs grow into mature plants. (Y2 to record results (measuring) in a table they have created. Draw simple diagrams to support explanation of what they have found out). Through researching the internet and using books they can find out and describe how plants need water, light and a suitable temperature to grow and stay healthy. They can also conduct their own experiment to find out what happens to a plant without sunlight for example. (Y2 can explain in detail what they have found out).	**Living things and their habitats** Explore and compare the differences between things that are living, dead and things that have never been alive (Y2 to give examples). Understand that most living things live in habitats to which they are suited; they explore their local environment to research this (Y2 can give examples of different habitats of where living things live). From research such as researching books, watching videos they are able to describe how different habitats provide for the basic needs of different kinds of animals and plants and how they depend on each other (Y2 can describe at least 4 different habitats of different living things). They can identify and name plants and animals in their habitats including micro habitats (Y2 can name several plants and animals in their habitats and microhabitats). They can describe how animals obtain their food from plants and other animals. They can use the idea of a simple food chain to identify and name different sources of food (Y2 can link their knowledge of carnivores, herbivores and omnivores to their learning. They can draw their own food chain).

	research the impact of exercise and diet on the body). Describe and compare the structure of a variety of animals (fish, amphibians, reptiles, birds and mammals including pets). (Y2 to explain in detail the similarities and differences between different animals). Identify, name, draw and label basic parts of the human body and say which part is associated with each sense. Chn can use their school environment to explore their senses. (Y2 to explain which part of their body is better for touching (find out through a mini investigation). **Vocabulary:** Fish, reptiles, amphibians, birds, mammals, carnivores, herbivores, omnivores, offspring, growth, height, weight, development, humans, names of different animals, basic needs, survive, exercise, balanced diet, hygiene, senses, see, hear, smell, touch, taste, germs, disease **Famous Scientist:** Florence Nightingale (social reformer, nurse) https://www.natgeokids.com/uk/discover/history/general-history/florence-nightingale/	**Vocabulary:** Wild, garden, deciduous, evergreen, trees, flowering, stem, petals, leaves, roots, bud, water, light, temperature, grow, healthy, seeds, bulbs, mature plants. Leaf, plant, flower blossom, fruit, berry, root, seed, trunk, branch, bark, names of trees in the local area (maple, beech, oak), names of garden and wild flowering plants in the local area (daisy, dandelion, daffodils, snowdrops, bluebells), shade, sun, warm, cool, water, grow, healthy. **Famous Scientist:** Charles Darwin (naturalist) https://www.dkfindout.com/uk/science/famous-scientists/charles-darwin/	**Vocabulary:** Living, dead, alive, habitats, dependent, plants, animals, micro habitats, food chain, predator, prey, living things, sources, never alive, suited, suitable, basic needs, shelter, move, feed, food, names of local habitats (pond, woodland), names of local micro-habitats (under logs, bushes, bonfire area). Famous Scientist: Jane Goodall (anthropologist) https://www.dkfindout.com/uk/science/famous-scientists/jane-goodall/
Year B	**Seasonal changes** Observe changes across the four seasons through fieldwork and using the internet (Y2 to record what they notice and have found out e.g. in the form of a table). Observe and describe weather associated with the four seasons and how day length varies through fieldwork and using the internet (Y2 to present what they have found out in the form of a report or a presentation). Vocabulary: Autumn, Winter, Summer, Spring, seasons, weather, clouds, sun, wind, rain, hail, snow, stormy, short days, longer days, clocks turning forward/backwards, light, dark, changes, similar, different, length, shorter, longer, sunrise, sunset, day length. **Famous Scientist:** Anders Celsius (astronomer) https://www.dkfindout.com/uk/science/famous-scientists/anders-celsius/ **CREST Star Awards (STEM)** *All children will work on developing their working scientifically skills through a range of different STEM activities that link to different topics within Science. The end points below link to the working scientifically skills.* Animal Adventure (link to animals including humans topic and living things topic). They can use pooters to find insects. They use magnifying glasses and draw the insect in detail and label key features. (Y2 can use microscopes to observe creatures in more detail. They record what they have found out). Vocabulary: Habitat, minibeast, invertebrate, insect, pooter, magnifying glass, microscopes, observe, notice. Discovery Bag (link to plants, living things and their habitats, everyday materials). They discuss similarities and differences between different trees (Y2 can record what they have found out). They can discuss and identify the different parts of trees (Y2 to use magnifying glasses to draw them in detail. They identify natural and man-made objects through exploration (Y2 to	**Everyday materials** Through practical investigation they can distinguish between an object and the material from which it is made (Y2 can match and write down the material and object it is made from). Through practical investigation they can identify and name a variety of everyday materials, including wood, plastic, glass, metal, water and rock (Y2 to identify and name at least three materials from each group). They can describe the simple physical properties of a variety of everyday materials (Y2 to describe in detail the properties of several everyday materials). They can compare a variety of everyday materials on the basis of simple physical properties. They can group-these materials together into groups pre-made by the teacher (Y2 to group materials together into groups thought of by themselves). Vocabulary: Wood, plastic, metal, water, glass, rock, properties, material, object, shiny, pointy, soft, hard, sharp, small, round, smooth, edges, properties, appearance, fabric, elastic, foil, card, rubber, wool, floppy, stretchy, bendy, waterproof, absorbent, breaks, tears, rough, dull, see-through, not see-through. Famous Scientist(s): John Loudon McAdam (inventor) https://www.bbc.co.uk/bitesize/clips/z7fnvcw Edgar Purnell Hooley (inventor) http://www.bbc.co.uk/nottingham/content/articles/2009/07/03/edgar_hooley_tarmac_feature.shtml	**Use of everyday materials** They can identify and compare the suitability of everyday materials including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses (e.g. a bathtub material). (Y2 can explain what materials would be best suited to use for particular situations/uses. For example what material would be best used for a ship. They can explain the reasons why this is and why other materials may not work so well (e.g. a brick can sink). Through research (books and videos) as well as practical investigations they can find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. (Y2 to recognise which materials cannot be changed and record what they have found out). Vocabulary: Wood, plastic, metal, glass, brick, rock, paper, cardboard, squashing, bending, twisting, stretching, materials, solid, uses, user, material, solid, opaque, transparent, translucent, reflective, non-reflective, rigid, push, pushing, pull, pulling, twist, squash, stretch, shape, shaping, bend. Famous Scientist: Ole Kirk Christiansen (inventor) https://www.lego.com/en-us/lego-history **CREST Star Awards (STEM)** *All children will work on developing their working scientifically skills through a range of different STEM activities that link to different topics within Science. The end points below link to the working scientifically skills.* Be Seen Be Safe (links to everyday materials and use of everyday materials) They can test different materials to see how reflective they are (Y2 to record their ideas in a table using a scale to say how releflective they are). They can conduct a test to see if other variables make a difference to reflectivity. Discuss what they have found out and share with the class (Y2 to record results). Key Vocabulary: Light, dark, reflect, reflective, source, safety. Muddy Mess (link to everyday materials and use of everyday materials) They can test different materials to find out which ones are most suitable and complete a pre-made table to record their results (Y2 to draw their own table to record their results). Key Vocabulary: Mud, materials, suitable, sample, fabric, soap. Scrap Yard Scraps (link to everyday materials and use of everyday materials)

	use an identification sheet to identify them.) Key Vocabulary: Natural, man made, leaf, leaves, bark, twigs, seeds, cones, pinecones, conkers. Plant detectives (link to plants and living things and their habitats topics) They can investigate and discover plants in their local environment and school grounds. Draw pictures of plants they have found. Use an identification sheet to research plants (Y2 to draw and annotate plants they have found. Y2 to record what plants they have found using an identification sheet). They can discuss where plants grow and how they get there and retell through role play (Y2 to record their thoughts in their books). Key Vocabulary: Plant, seeds, sampling, nature, moss, mosses, lichen, funghi, trees, twigs, flowers,		They can discuss which materials might be best for keeping a mouse warm (Y2 can write a prediction on which materials might be best for keeping a mouse warm and give reasons why). They can test different materials and record results in a pre-made table (Y2 to record results in their own table). Key Vocabulary: Materials, thermometer, heat, degrees, celsius

Key Stage Two

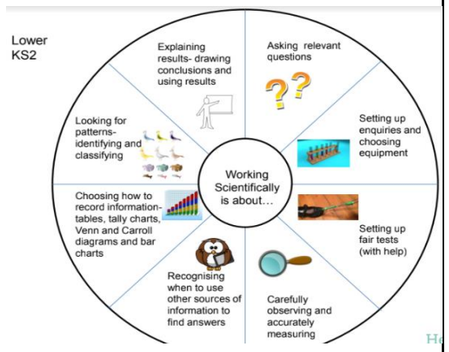
Our Key Stage Two curriculum follows the National Curriculum. Using The Association for Science Education, we have identified the key skills and knowledge we ensure our pupils reach by the end of Year 4 in order to access the upper Key Stage 2 curriculum when they move into Year 5.

Year Three end points

Year Four end points.

Each lesson sees at least one focus on working scientifically:

- Asking relevant questions
- Setting up enquiries and choosing equipment
- Setting up fair tests with help
- Carefully observing and accurately measuring
- Recognising when to use other sources of information to find answers
- Choosing how to record information – tables, tally charts, Venn and Carroll diagrams and bar charts
- Looking for patterns – identifying and classifying
- Explaining results – drawing conclusions and results



	Autumn	Spring	Summer
Year A	**Electricity** They can identify common appliances that run on electricity (Y4 can record a number of common appliances that run on electricity). They can construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers (Y4 can construct a number of simple series electrical circuits). They can 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 (Y4 can write a prediction and give reasons to support their prediction). Through practical investigations they recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit (Y4 can explain what happens when a switch opens and closes a circuit). They recognise some common conductors and insulators, and associate metals with being good conductors (Y4 recognise the difference between conductors and insulators). **They will also be taught about the importance of working safely with electricity.** Vocabulary: Appliances, electric, electricity, battery powered, power, current, cells, wires, bulbs, switches, buzzers, simple series circuit, loop, complete, incomplete, open, closed, conductors, insulators, metals. **Famous Scientist:** Thomas Edison (inventor) https://www.dkfindout.com/uk/science/famous-scientists/thomas-edison/	**States of Matter** They can compare and group materials together according to whether they are solids, liquids or gases and they can record their results in a venn diagram or a table. (Y4 can decide which format is best to record their results e.g. a table. They can explain in detail how solids, liquids and gases are different from one another). They observe that some materials change state when heated or cooled through their own research or experiments. They can measure or research the temperature at which this happens in degrees Celsuis °C (Y4 discuss what materials did not change state and why this may be the case). They can identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature. They may find this out through conducting their own experiments (Y4 to record what they have found out and present their findings). Vocabulary: Solids, liquids, gases, compare, group, state, heated, cooled, degrees, degrees Celsuis, measure, evaporation, condensation, water cycle, rate of evaporation, temperature, steam, rain. **Famous Scientist:** Joseph Priestly (chemist) https://www.scienceforkidsclub.com/oxygen.html **Plants** They can identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers (Y4 to describe in detail). They can 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 (Y4	**Forces and Magnets** They can compare how things move on different surfaces through exploration (Y4 write their own predictions and conduct their own investigation). They notice that some forces need contact between two objects, but magnetic forces can act at a distance (Y4 can draw basic diagrams to explain this). They can observe how magnets attract or repel each other and attract some materials and not others (Y4 record their results). They can 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 (Y4 to compare a number of everyday objects). They can describe magnets as having two poles (Y4 to draw a diagram to explain this). They can predict whether two magnets will attract or repel each other, depending on which poles are facing (Y4 to predict and give reasons supporting their prediction). **Vocabulary:** Rough, smooth, shiny, bumpy, surfaces, forces, contact, magnetic force, repel, attract, magnetic, non-magnetic, poles, North Pole, South Pole. **Famous Scientist:** Michael Faraday (chemist, physicist, and inventor) https://www.dkfindout.com/uk/science/famous-scientists/michael-faraday/ **Animals Including Humans** They can describe the simple functions of the basic parts of the digestive system in humans (Y4 can annotate a diagram explaining this). They can identify the different types of teeth in humans and their simple functions (Y4 to also look at the teeth of herbivores, omnivores and carnivores and compare them).

		conduct their own research). They can investigate the way in which water is transported within plants through conducting their own research (Y4 present their findings and draw their own diagrams). They can explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal (Y4 recognise the life cycle of a flowering plant). Vocabulary: Root, stem, trunk, leaves, flowers, growth, needs, air, light, water, nutrients, soil, space, water, transportation, life cycle, pollination, seed formation, seed dispersal. **Famous Scientist:** George Washington Carver (botanist) https://www.dkfindout.com/uk/science/famous-scientists/george-washington-carver/	They can construct and interpret a variety of food chains, identifying producers, predators and prey (Y4 to interpret a number of different food chains for carnivores and omnivores). Vocabulary: Digestive system, teeth, incisors, canines, premolars, molars, and third molars, food chains, prey, predators, producers. **Famous Scientist:** David Attenborough (naturalist) https://www.natgeokids.com/uk/discover/science/nature/david-attenborough-facts/
Year B	**Light** They can recognise that they need light in order to see things and that dark is the absence of light. Through investigation (supported by an adult) they notice that light is reflected off surfaces (Y4 begin to recognise that light reflects off some surfaces better than others). They recognise that light from the sun can be dangerous and that there are ways to protect their eyes (Y4 can list ways to protect their eyes). They recognise through conducting their own investigation that shadows are formed when the light from a source is blocked by an opaque object (they can draw diagrams to explain how shadows are formed). Through practical experiments they can find patterns in the way that the size of shadows change (Y4 can explain why this changes depending on different circumstances e.g. the angle of light and the time of the day). Vocabulary: Light, dark, reflected, surfaces, danger, rays, protection, shadows, blocked, opaque, position, light. Famous Scientist: Isaac Newton (mathematician) https://www.dkfindout.com/uk/science/famous-scientists/isaac-newton/	**Sound** They can identify how sounds are made, associating some of them with something vibrating. Through practical investigations and research they recognise that vibrations from sounds travel through a medium to the ear (Y4 can use diagrams to explain this). They can find patterns between pitch of sound and features of the object that produces it (Y4 record their findings). They can find patterns between the volume of a sound and the strength of the vibrations that produced it (Y4 record what they have noticed and present their findings). They recognise that sounds get fainter in the distance from the sound source and the sounds increase the shorter the distance from the sound (Y4 create their own table to record their results). Vocabulary: Produced, sound, vibrating, vibrations, travel, medium, ear, pitch, volume, fainter, louder. Famous Scientist: Alexander Graham Bell (inventor) https://www.dkfindout.com/uk/science/famous-scientists/alexander-graham-bell/ **Living things and their habitats** They recognise that living things can be grouped in different ways (Y4 to group living things into their own groups). Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment (Y4 to sketch the living things and their habitats and annotate them). They recognise that environments can change and this can sometimes pose dangers to living things (Y4 to conduct their own research to find out and also give several examples). Vocabulary: Environment, classify, habitats, living, alive, dangers. Famous scientist: Rachel Carson (marine biologist) https://www.dkfindout.com/uk/science/famous-scientists/rachel-carson/	**Rocks** They can compare and group together different kinds of rocks on the basis of their appearance and simple physical properties (Y4 to sketch, annotate and describe different rocks). They can describe in simple terms how fossils are formed when things that have lived are trapped within rock (Y4 to also sequence the stages of how fossils are formed using diagrams). They recognise that soils are made from rocks and organic matter (Y4 to also explore what happens when two rocks are rubbed together). Vocabulary: Fossils, rocks, ammoniate, soils, organic matter, trapped, creatures, died, smooth, hard, sharp, pointy, flat, cold, trapped. Famous Scientist: Mary Anning (fossil hunter) https://www.bbc.co.uk/bitesize/topics/zd8fv9q/articles/zf6vb82 **Animals including Humans** They can 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 (Y4 to explore different diets of a number of animals). Identify that humans and some other animals have skeletons and muscles for support, protection and movement (Y4 to investigate what might happen if humans and animals didn't have skeletons). Vocabulary: Dairy, vegetables, fruit, carbohydrates, fat, balanced diet, nutrition, skeletons, muscles, structure, support, protection, organs, movement. Famous Scientist: Marie Curie (physicist) https://www.dkfindout.com/uk/science/famous-scientists/marie-curie/