ESJ Science Curriculum Knowledge and Skills Progression Map 2024-2025						
	Autumn 1	**Autumn 2**	**Spring 1**	**Spring 2**	**Summer 1**	**Summer 2**
	Year 1					
Units	**The Human Body**	**Materials- Let's build**	**Wonderful Weather**	**Animals: Our Pets**	**Plants- What's growing in our garden?**	**Experiments: Marvellous materials**
Key knowledge	The body has lots of parts. Each part of the body has a name. Most bodies have a head, neck, arms, elbows, hands, legs, knees, feet, face, ears, eyes, nose, hair, mouth, and teeth. The body has lots of parts. You can see when there is light. You cannot see in the dark. Some people cannot see. Humans use their ears to hear sounds. When sounds are quiet, they can be harder to hear. When sounds are loud, they are easier to hear. The tongue helps humans to taste. The tongue is in the mouth. There are five basic tastes – sweet, salty, sour, bitter, and savoury. The skin is the part of the body that helps us to sense touch. Skin covers the whole body. We can sense touch using different parts of the body. The nose helps us to sense smell. The nose is on the face. Some objects have a stronger smell than others.	Distinguish between an object and the material from which it is made. Can identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock. Describe the simple physical properties of a variety of everyday materials. Know how the properties of a material can make it useful for a range of different purposes (for example, plastic is waterproof so it can be used to coat fabric for clothing but can also be used for outdoor play equipment). Knows why and how the properties of materials make them particularly useful for specific purposes (for example, stone is a hard, heavy and durable material so is useful for construction of buildings). Knows that different materials can share the same properties (for example glass and plastic can both be transparent).	Knows when each of the four seasons occurs. Knows what the features of autumn are and what happens to trees in this season Knows that days are longer in summer (sunshine hours) than in winter. Observe changes across the four seasons.	Knows and can identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals e.g. cat, robin, adder, frog, salmon. Knows and can identify and name a variety of common animals that are carnivores, herbivores and omnivores. Can identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.	Knows and can identify and name a variety of common wild and garden plants, including deciduous and evergreen trees. Knows and can identify and describe the basic structure of a variety of common flowering plants, including trees.	Differences between the four seasons. Know how a tree changes throughout the year and describe its features in summer. Why it is important to stay safe in the sun and ways to stay safe in the sun. Why it is not ever safe to look directly at the sun. Know what temperature water freezes at. That the reverse of freezing is melting. Know which materials will be useful for insulation.
Working scientifically	Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.	Compare and group together a variety of everyday materials on the basis of their simple physical properties.	Gather and record data about weather conditions in autumn, drawing on observation and using simple equipment (such	Make first-hand close observations of animals from each of the groups (city farm) Compare the structure of two animals from the same	Can sort and group parts of plants using similarities and differences e.g. the shape of	Observation – looking at trees, signs of summer, observing ice melting, and observing temperature changing.

	Working scientifically – Using their observations and ideas to suggest answers to questions. Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense. Performing simple tests. Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.	Classify objects made of one material in different ways e.g. a group of objects made of metal. Classify one type of object made from a range of materials e.g. a collection of spoons made of different materials. Chosen an appropriate method for testing an object for a particular property. Use their test evidence to answer. the questions about properties e.g. Which cloth is the most absorbent? Test the properties of objects e.g. absorbency of cloths, strength of party hats made of different papers, stiffness of paper plates, waterproofness of shelters.	as a container to measure rainfall) Use data to create a pictogram and use this to describe changes in day length over the seasons. Use their evidence to describe some other features of the weather, surroundings, themselves, animals, and plants found in autumn. Demonstrate their knowledge in different ways e.g. creating seasonal artwork, creating a pictogram (and use this to ask and answer related questions)	or different group e.g. wings, feathers, vertebrates/invertebrates. Classify animals using a range of features e.g. lay eggs/give birth to live young. herbivore, omnivore (these terms do not have to be explicitly taught). Identify animals by matching statements to named images. Take measurements of parts of the body and present results in a table to interpret. Conduct simple sense experiments. Which part of my body is good for feeling, which is not? Which food/flavours can I identify by taste? Which smells can I match?	leaves, the colour of the flower/blossom. Can use simple charts and Venn diagrams etc. to identify and classify plants. Use photographs and their own observations to talk about how plants change over time (e.g.seed sapling to tree) and over the year (deciduous and fruit-bearing trees). Plant seeds and observe how they grow and change by making simple observations. Point to and name the parts of a plant, recognising that they are not always the same e.g. leaves and stems may not be green, the leaves are different shapes.	Recording and gathering information – daily weather chart, simple test recording data. Problem Solving – make a raft that can hold multilink cubes.
	Year 2					
Units	**Habitats**	**Animals including humans Materials**	**Everyday Materials**	**Environment**	**Plants**	**Scientists and Inventors**
Key knowledge	To be able to compare the differences between things that are living, dead and have never been alive. To understand about living processes. To identify habitats of living things- humans, animals plants. Identify local habitats- urban, spinney (woodland) natures garden – pond. Identify/investigate the living things found in a microhabitat. Eg leaf, rock- name minibeasts found. Name and describe different habitats.	Know that animals have different types of offspring. Know that the term 'offspring' means baby. Know that not all offspring looks like its adult when it is born. Understand and describe different life cycles. Use scientific vocabulary when talking about different life cycles. Identify which animal group different animals belong to, and why. Identify several ways that humans grow and	Understand what objects are made from- materials used. Why these materials are used eg glass for windows How can we recycle these materials- which materials can be recycled or re used. Invention- what materials have been invented- John McAdam and Macadamisation.	Know something about climate change. Know something about greenhouse gases. Know the job of the sun- what it provides for the planet/animals/people. Talk about how to reduce, reuse and recycle items, and what those terms mean. Identify different types of energy. Identify renewable and non-renewable energy, and talk about them. Know some ways that we can reduce the amount of energy we use.	Knows that plants may grow from either seeds or bulbs. knows that seeds and bulbs can germinate and then grow into seedlings and then continue to grow into mature plants. Knows that mature plants may have flowers which then develop into seeds, berries and fruits etc. Knows that seeds and bulbs need to be planted at particular times of the year and will	Know what plants need to grow well. Know some people who use science to help others. Know how to plant a bean seed in order for it to grow well. Identify parts of a plant. Recall facts about Jane Colden. Know what I need to do to stay healthy. Understand why we need to make healthy life choices. Know how a doctor uses science in their job.

	Explain how the plants and animals adapt to live in that habitat. Desert, polar regions, tropical rainforest, oceans. Name animals/plants found in a habitat. How the plants and animals help each other to survive. Dependency. I can name food sources. I can identify a carnivore, herbivore and omnivore.	develop through each life cycle stage. Name the three basic needs of all animals to survive. They can describe the specific needs of a given animal. Describe the effects of exercise and begin to explain the importance of exercise for the human body. Identify several foods according to the basic food groups and can talk about the importance of a balanced diet. They can explain how to be hygienic and why this is important.		Talk about the rainforest. How to reduce the amount of water we use. Why reducing the amount of water we use can help save the environment. What the word 'endangered' means. Why some animals are becoming endangered. How we can stop animals from becoming endangered.	germinate and grow at different rates. Knows that some plants are better suited to growing in full sun and some grow better in partial and full shade. Knows that plants need water, light and a suitable temperature to grow and stay healthy.	Understand how germs spread. Understand why we need to wash our hands properly. Understand how we wash our hands properly. Understand which materials are waterproof and why. Understand what makes material waterproof. Understand how pollution occurs. Understand what constitutes pollution.
Working scientifically	Use their observations and ideas to suggest answers to questions by explaining how they know something is living, dead or has never been alive. Present their ideas and evidence in appropriate ways. Use simple vocabulary to describe their observations. Use simple scientific vocabulary to describe my ideas. Draw on their observations and ideas to offer answers to questions. Sort and group living things based on their observations. Sort and group living objects on the basis of what they have observed.	Make comparisons between basic features of living things Draw on their observations and ideas to offer answers to questions Use simple scientific vocabulary to describe their ideas and observations Use simple texts to find information Present their ideas and evidence in appropriate ways Ask simple scientific questions and use scientific language to answer them. Use simple secondary sources to find answers and talk about their findings to an audience. Carry out simple practical tests and use their observations and ideas to suggest answers to questions. Carry out simple practical tests, make careful observations and draw simple conclusions.	I can draw on my observations to offer answers to questions. I can present evidence that I have collected in a table. I can share my ideas and listen to the ideas of others. We can work together on an investigation. Draw on their everyday experience to help answer a question. Make comparisons between objects. Use simple scientific vocabulary to describe their ideas and observations. Say what happened in their investigation.	Say what happened in their experiment or investigation. Say whether what happened was what they expected, acknowledging any unexpected outcomes. Present their ideas and evidence in appropriate ways. Sort and group objects. Work together, and recognise contributions made by others. Draw on their observations to offer answers to questions. Use simple scientific vocabulary to describe their observations.	Make close observations of seeds and bulbs. Classify seeds and bulbs. Research and plan when and how to plant a range of seeds and bulbs. Look after the plants as they grow – weeding, thinning, watering etc. Make close observations and measurements of their plantsgrowing from seeds and bulbs. Make comparisons between plants as they grow. Can spot similarities and difference between bulbs and seeds.	Identify people who use science to help others. Draw on their observations and ideas to offer answers to questions. Work together to build a greenhouse. Follow a set of instructions to plant a bean seed. Recognise basic features of living things. Identify people who use science to help people. Present their ideas and evidence in appropriate ways. Respond to prompts to say what happened. Say what happened in their experiment or investigation. Use simple scientific vocabulary to describe their ideas and observations. Express personal feelings or opinions about scientific phenomena.

						Correctly use equipment provided to make observations and measurements. Say what happened in their experiment or investigation.
	Year 3/4					
Unit	**Electricity**	**Sound**	**Animals including humans**	**What's the matter?**	**Living things and their habitats**	**Living things and their habitats**
Key Knowledge	I can identify appliances that require electricity. I can identify the parts of a circuit. I can identify complete and incomplete circuits. I can recognise conductors and insulators. I can understand the function of a switch	Identify how sounds are made, associating some of them with something vibrating. Recognise that vibrations from sounds travel through a medium to the ear. Identify how sounds are made, associating some of them with something vibrating. Recognise that sounds get fainter as the distance from the sound source increases.	To understand the simple functions of the basic parts of the digestive system in humans. To understand that all living things depend on one another for nutrition. To describe and understand the simple functions of the basic parts of the digestive system in humans. To identify the different types of teeth in humans and their simple functions. To describe the simple functions of the basic parts of the digestive system in humans. To identify the different types of teeth in humans and their simple functions. To interpret a variety of food chains, identifying producers, predators and prey.	Compare and group materials together, according to whether they are solids, liquids or gases. Observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C). Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.	Know that wildlife can be affected by human activity. Understand the meaning of key scientific words like habitat, ecosystem, survey and evidence. Recognise that environments can change and that this can sometimes pose dangers to living things. Recognise that living things can be grouped in a variety of ways. Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment. Know some endangered animals and how they became endangered. Know the impact the change in environment has.	Recognise that living things can be grouped in a variety of ways. Recognise that environments can change and that this can sometimes pose dangers to living things.
Working Scientifically	Identify common appliances that run on electricity. Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers. Identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery.	Asking relevant questions and using different types of scientific enquiries to answer them. Find patterns between the volume of a sound and the strength of the vibrations that produced it. Setting up simple practical enquiries, comparative and fair tests. Making systematic and careful observations and,	Asking relevant questions and using different types of scientific enquiries to answer them. Setting up simple practical enquiries, comparative and fair tests. Identifying differences, similarities or changes related to simple scientific ideas and processes. Asking systematic and careful observations (of their teeth) identifying differences,	Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers. Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions asking relevant questions and using different types of	Making systematic and careful observations and, where appropriate, taking accurate measurements. gathering, recording, classifying and presenting data in a variety of ways to help in answering questions. Asking relevant questions and using different types of scientific enquiries to answer them.	Asking relevant questions and using different types of scientific enquiries to answer them. Identifying differences, similarities or changes related to simple scientific ideas and processes. Reporting on findings from enquiries, including oral and written explanations, displays or

	Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit. Recognise some common conductors and insulators, and associate metals with being good conductors. Ask relevant questions and use different types of scientific enquiries to answer them. Set up simple practical enquiries, comparative and fair tests. Make systematic and careful observations. Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts and tables.	where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers. Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions. Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables. Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions. Identifying differences, similarities or changes related to simple scientific ideas and processes. Using straightforward scientific evidence to answer questions or to support their findings. Find patterns between the pitch of a sound and features of the object that produced it. Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.	similarities or changes related to simple scientific ideas and processes. Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions. Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions recording findings using simple. Scientific language, drawings, labelled diagrams, keys, bar charts, and tables. Describe the simple functions of the basic parts of the digestive system in humans. Identify the different types of teeth in humans and their simple functions. Construct and interpret a variety of food chains, identifying producers, predators and prey.	scientific enquiries to answer them. Using straightforward scientific evidence to answer questions or to support their findings Identifying differences, similarities or changes related to simple scientific ideas and processes. Setting up simple practical enquiries, comparative and fair tests. Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and table.	Identifying differences, similarities or changes related to simple scientific ideas and processes Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment.	presentations of results and conclusions. Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers. Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables. Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions gathering, recording, classifying and presenting data in a variety of ways to help in answering questions.
	Year 5					
Unit	**Scientists and Inventors**		**Reversible and Irreversible Changes**	**Plastic Pollution**	**Living Things and their Habitats**	**Animals Including Humans**
Key knowledge	Answer questions about David Attenborough's life and work. Describe Margaret Hamilton's work on programming the on-board computer for the Apollo 11 spacecraft. List the planets in our solar system. Describe Leonardo da Vinci's life and his famous work. Order facts about Eva Crane's life and work. Describe the theory that Stonehenge could have been used as an astronomical calendar.		Different materials are used for particular jobs based on their properties: electrical conductivity, flexibility, hardness, insulators, magnetism, solubility, thermal conductivity, transparency.	Know what plastic pollution is. Know how plastic pollution affects the planet.	Identify parts of a flower. Give one difference between sexual and asexual reproduction. Describe ways plants can be pollinated. Identify plants that reproduce asexually.	Children can explain what gestation periods are for different animals, including humans. Children can describe the changes as humans

		Reversible changes, such as mixing and dissolving solids and liquids together, can be reversed by: sieving, filtering, evaporating. Irreversible changes often result in a new product being made from the old materials (reactants). For example, burning wood produces ash. Mixing vinegar and milk produces casein plastic. A solution is made when solid particles are mixed with liquid particles. Materials that will dissolve are known as soluble. Materials that won't dissolve are known as insoluble. A suspension is when the particles don't dissolve.		Describe ways to grow new plants other than from seed. Identify the stages in the process of sexual reproduction. Identify different types of mammals. Give three facts about Jane Goodall. Describe threats faced by chimpanzees. Identify familiar animals that undergo metamorphosis.	develop from fertilisation to birth. Children can explain how babies grow and develop into children. Children can describe and explain the main changes that occur during puberty. Children can describe and explain the main changes that take place in old age. Children can describe and explain the stages of human development.
Working scientifically	Research and present facts about living things, including diet and habitat. Group and rank materials based on their hardness and weight. Carry out an inquiry to test the accuracy of Leonardo da Vinci's ideas about proportion. Identify different types of evidence.	Compare and group materials based on their properties, including hardness, transparency, magnetism and ability to conduct heat and electricity. Suggest materials for a given purpose, explaining why some materials will be suitable and why other materials will not be suitable. Explain the process of dissolving and sort materials based on whether they are soluble or insoluble. Understand how to recover a solute from a solution using evaporation. Separate a variety of mixtures using the processes of sieving, filtering, magnetism and dissolving. Explain the difference between reversible and irreversible reactions, giving examples of each.	Decide on the most appropriate formats to present sets of scientific data, such as using line graphs for continuous variables. Use appropriate scientific and mathematical conventions and terminology to communicate abstract ideas. Suggest how collaborative approaches to specific experiments or investigations may improve the evidence collected. Identify patterns in data presented in various formats, including line graphs. Draw straightforward conclusions from data presented in various formats. Identify scientific evidence they have used in drawing Conclusions.	Take cuttings and observe their growth over time. Observe plant growth throughout the year from a variety of plants e.g. strawberry plants, spider plants, potato plants and plants that grow from bulbs. Observe metamorphosis in animals such as caterpillars (or tadpoles if you have a school pond). Notice patterns in how flowers are pollinated. Sort flowers into groups of those that are pollinated by the wind and those that are pollinated by insects. Sort statements into groups of advantages and disadvantages of sexual and asexual reproduction in plants.	Children can plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary. Children can record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs. Children can report and present findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations.

			Suggest improvements to their working methods, giving reasons.	Group animals based on similarities and differences in their life cycles. Order the stages of the life cycles of mammals, birds, insects and amphibians.	Children can identify scientific evidence that has been used to support or refute ideas or arguments.
	Year 6				
Unit	**Living things in their environment, including microorganisms**	**Evolution and inheritance**	**Electricity**	**Light**	**Animals including humans**
Key knowledge	The idea that broad groupings, such as micro-organisms, plants and animals can be subdivided. Know that we classify animals into commonly found invertebrates (such as insects, spiders, snails, worms) and vertebrates (fish, amphibians, reptiles, birds and mammals). Know why the work of scientists such as Carl Linnaeus, a pioneer of classification is significant.	Develop an understanding of the development of evolutionary ideas and theories over time. Explain how human evolution has occurred and compare modern humans with those of the same genus and family. Understand that adaptation and evolution is not a uniform process for all living things. Give examples of selective and cross-breeding. Identify inherited traits and adaptive traits. Understand that adaptations are random mutations.	Explain how our understanding of electricity has changed over time. Draw circuit diagrams using the correct symbols and label the voltage correctly.	Explain how light travels to enable us to see. Understand that all objects reflect light. Identify the angles of incidence and reflection. Understand refraction as light bending or changing direction. Explain how a prism allows us to see the visible spectrum. Understand that colours are a result of light reflecting off an object. Explain Isaac Newton's experiments about light and colour. Understand how shadows change size. Understand that shadows are the same shape as the object that casts them. Be able to answer questions based on their learning.	Children can state the three main parts of the circulatory system and describe the job of the heart. Children can describe the important jobs of the blood vessels and blood. Children can discuss how heart rate is affected by exercise. Children can understand that regular exercise is important for a healthy body. Children can discuss how diet and exercise affect the body. Children can discuss the impact of drugs and lifestyle on the way bodies function.
Working scientifically	Through direct observations where possible, they should classify animals into commonly found invertebrates (such as insects, spiders, snails, worms) and vertebrates (fish, amphibians, reptiles, birds and mammals). Find out about the significance of the work of scientists such as Carl Linnaeus, a pioneer of classification. Use classification systems and keys to identify some animals and plants in the immediate environment.	Investigate the ethical issues of human intervention in the process of evolution by natural selection. Examine fossil evidence supporting the idea of evolution. Distinguish between opinion and scientific evidence in contexts related to science, and use evidence rather than opinion to support or	Decide which variables to control while planning an investigation. Decide how to report their findings. Make new predictions based on the previous results. Select an appropriate scientific enquiry.	Make observations and conclusions. Set up reliable and accurate investigations. Make and explain predictions. Make and record accurate observations. Use scientific language to explain their findings. Be able to ask and answer questions based	Children can identify scientific evidence that has been used to support or refute ideas or arguments. Children can plan different types of scientific enquiries to answer questions, including recognising

		challenge scientific arguments. Decide on the most appropriate formats to present sets of scientific data, such as using line graphs for continuous variables. Use appropriate scientific and mathematical conventions and terminology to communicate abstract ideas. Suggest how collaborative approaches to specific experiments or investigations may prove the evidence collected.		on their learning using scientific language.	and controlling variables where necessary; record data and results of increasing complexity using classification keys, tables, scatter graphs, bar and line graphs; report findings from enquiries, including conclusions and degree of trust in results, in written forms by reporting and presenting the findings of their enquiry. Children can record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.