

Science Progression of Skills: LKS2

Essential Skills for all children every year

- The ability to think independently and raise questions about working scientifically and the knowledge and skills that it brings.
- Confidence and competence in the full range of practical skills, taking the initiative in, for example, planning and carrying out scientific investigations.
- Excellent scientific knowledge and understanding which is demonstrated in written and verbal explanations, solving challenging problems and reporting scientific findings.
- High levels of originality, imagination or innovation in the application of skills.
- The ability to undertake practical work in a variety of contexts, including fieldwork.
- A passion for science and its application in past, present and future technologies.

Note: Objectives in *green italics* are opportunities to revise topic when not covered within the year or are topics which are not statutory at that year.

	Y3	Y4
SKILLS: Work scientifically This concept involves learning the methodologies of the discipline of science.	Ask relevant questions and use different types of scientific enquiry to answer them.	Ask relevant questions and use practical, comparative and fair tests to answer them, with support.
	After teacher modelling, make accurate measurements using standard units, using a range of equipment, e.g. metre sticks, .	Make accurate measurements using standard units, using a range of equipment, e.g. thermometers and data loggers.
	Gather and record data to help in answering questions. Use simple measurements and equipment (e.g. hand lenses, egg timers) to gather data.	Gather, record, classify and present data in a variety of ways to help in answering questions. Report on findings using oral and written explanations. Use the results to predict, hypothesise and ask new questions.
KNOWLEDGE: Understand plants This concept involves becoming familiar with different types of plants, their structure and reproduction.	To understand what a range of flowering plants need to grow healthily and describe the functions of different parts: - roots, stem/trunk, leaves and flowers. 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. Investigate the way in which water is transported within plants.	<i>To revise what a range of flowering plants need to grow healthily and describe the functions of different parts: - roots, stem/trunk, leaves and flowers.</i>

	Explore the role of flowers in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. Explore Vocabulary: Pollination, germination, seed dispersal, nutrients	
Understand animals and humans This concept involves becoming familiar with different types of animals, humans and the life processes they share.	<i>To revise classification of animals and healthy lifestyles for adults.</i> 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. Identify that humans and some other animals have skeletons and muscles for support, protection and movement. They might compare and contrast the diets of different animals (including their pets) and decide ways of grouping them according to what they eat. They might research different food groups and how they keep us healthy and design meals based on what they find out Explore Vocabulary: Nutrition, vitamins, minerals, fat, protein, carbohydrates, fibre	Identify that animals, including humans, need the right types and amounts of nutrition, that they cannot make their own food and they get nutrition from what they eat. Construct and interpret a variety of food chains, identifying producers, predators and prey. 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. Pupils might work scientifically by: comparing the teeth of carnivores and herbivores, and suggesting reasons for differences; finding out what damages teeth and how to look after them. They might draw and discuss their ideas about the digestive system and compare them with models or images. Explore vocabulary: Prey, Predator, Food Chain, Diet, Carnivore, Omnivore, Herbivore
Investigate living things This concept involves becoming familiar with a wider range of living things, including insects and understanding life processes.	<i>Revise simple food chains and mirco-habitats.</i>	Recognise that living things can be grouped in a variety of ways. Explore and use simple classification keys. Recognise that environments can change and that this can sometimes pose dangers to specific habitats. Pupils should use the local environment throughout the year to raise and answer questions that help them to identify and study plants and animals in their habitat. They should identify how the habitat changes throughout the year. Pupils should explore possible ways of grouping a wide selection of living things that include animals and flowering plants and non-flowering plants. Pupils could begin to put vertebrate animals into groups such as fish, amphibians, reptiles, birds, and mammals; and invertebrates into snails and slugs, worms, spiders, and insects

		Pupils should explore examples of human impact (both positive and negative) on environments, for example, the positive effects of nature reserves, ecologically planned parks, or garden ponds, and the negative effects of population and development, litter or deforestation. Explore Vocabulary: Environment, deforestation, population, development. Vertebrate/ Invertebrate
Understand evolution and inheritance This concept involves understanding that organisms come into existence, adapt, change and evolve and become extinct.	<i>Identify how plants and animals, including humans, resemble their parents in many features.</i>	<i>Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago.</i> <i>Identify how animals and plants are suited to and adapt to their environment in different ways</i>
Investigate materials This concept involves becoming familiar with a range of materials, their properties, uses and how they may be altered or changed.	Know uses of materials and begin to compare them. Rocks and Soils Compare and group together different kinds of rocks on the basis of their simple, physical properties. Relate the simple physical properties of some rocks to their formation (igneous or sedimentary). Describe in simple terms how fossils are formed when things that have lived are trapped within sedimentary rock. Recognise that soils are made from rocks and organic matter. Link to Geography and locate volcanoes around the Earth. Pupils could explore different soils and identify similarities and differences between them and investigate what happens when rocks are rubbed together or what changes occur when they are in water. They can raise and answer questions about the way soils are formed. Explore Vocabulary: Sedimentary, organic matter, grains, crystals, fossils.	Know uses and properties of materials, to compare them and know whether they are solid, liquid or gas. Explore vocabulary: Solid Condense Liquid Evaporate States of Matter 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 the temperature at which this happens in degrees Celsius (°C), building on their teaching in mathematics. Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature. They should find out about how chemists create new materials, for example, Spencer Silver, who invented the glue for sticky notes or Ruth Benerito, who invented wrinkle-free cotton
Understand movement, forces and magnets This concept involves understanding what causes motion.	Magnets/Forces Compare how things move on different surfaces.	

	Notice that some forces need contact between two objects, but magnetic forces can act at a distance. Observe how magnets attract or repel each other and attract some materials and not others. 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. Describe magnets as having two poles. Predict whether two magnets will attract or repel each other, depending on which poles are facing. Pupils should observe that magnetic forces can act without direct contact, unlike most forces, where direct contact is necessary (for example, opening a door, pushing a swing). They should explore the behaviour and everyday uses of different magnets (for example, bar, ring, button and horseshoe). Explore vocabulary: Forces, attract, magnetic, poles, magnetic field, repel	
Understand light and seeing This concept involves understanding how light and reflection affect sight.	Recognise that they need light in order to see things and that dark is the absence of light. Notice that light is reflected from surfaces. Recognise that light from the sun can be dangerous and that there are ways to protect their eyes. Recognise that shadows are formed when the light from a light source is blocked by a solid object. Find patterns in the way that the size of shadows change. Explore Vocabulary: Reflect, surface, natural, artificial, dangerous, dark	
Investigate sound and hearing This concept involves understanding how sound is produced, how it travels and how it is heard.		Identify how sounds are made, associating some of them with something vibrating. Recognise that vibrations from sounds travel through a medium to the ear.

		Find patterns between the pitch of a sound and features of the object that produced it. Find patterns between the volume of a sound and the strength of the vibrations that produced it. Recognise that sounds get fainter as the distance from the sound source increases. Explore Vocabulary: Vibrate, vibration, vibrating, precision, insulate, volume, pitch, pulse.
Understand electrical circuits This concept involves understanding circuits and their role in electrical applications.		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. 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. Explore Vocabulary: Wire, bulb, appliances, electricity, insulators, conductors, circuit, switch.
Understand the Earth's movement in space This concept involves understanding what causes seasonal changes, day and night.		<i>Describe the movement of the Earth relative to the Sun in the solar system.</i> <i>Describe the movement of the Moon relative to the Earth.</i>