Sandfield Primary School

Subject area: Science

Subject Intent:

Curious and inquisitive pupils leave with the confidence to apply investigative and critical thinking skills to the wider world based on their scientific knowledge.

Skills, knowledge and vocabulary are taught through a two-year cycle phased approach in KS2. EYFS, Year 1 and 2 topics are taught separately.

Year R

Topic	Knowledge	Skills
Plants	To know about plant seeds and how to care for growing plants. To know and understand the key features of the life cycle of a plant. To know and understand the need to respect and care for the natural environment and all living things., from their starting point Key Vocabulary: seeds, roots, stem, leaves, flowers	Identify basic parts of a plant Compare leaves Draw and label plants Ask questions Answer how and why questions about their experiences Make observations of animals and plants and explain why some things occur, and talk about changes Create simple representations of events, people and objects
Living things and their habitats	To know and explore the natural world around them. To recognise some environments that are different to the one in which they live. Key Vocabulary: shelter, food, water, light, dark	Ask questions Find ways to solve problems / find new ways to do things / test their ideas Creating & Thinking Critically Develop ideas of grouping, sequences, cause and effect Creating &Thinking Critically Know about similarities and differences in relation to places, objects, materials and living things Make links and notice patterns in their experience Creating & Thinking Critically
Materials, including changing materials	To know how to use all their senses in hands-on exploration of natural materials. To know and explore collections of materials with similar and/or different properties. To know and to be able to talk about the differences between materials and changes they notice. Key Vocabulary: soft, hard, smooth, metal, wood	Explore common materials Develop ideas of grouping, sequences, cause and effect Creating &Thinking Critically Know about similarities and differences in relation to places, objects, materials and living things

Seasonal changes	To know and explore the natural world around them. To know how to describe what they see, hear and feel whilst outside. To know and understand the effect of changing seasons on the natural world around them. **Key Vocabulary:** seasons, autumn, winter, spring, summer	Observe seasonal characteristics & changes. Show curiosity about objects, events and people- Playing & Exploring Questions why things happen Comments and asks questions about aspects of their familiar world such as the place where they live or the natural world Make links and notice patterns in their experience Creating & Thinking Critically Ask questions
Animals including humans	To know and understand the key features of the life cycle of an animal. To know how to use all their senses in hands-on exploration of natural materials. To know, name and describe people who are familiar to them. **Key Vocabulary:** body, head, arms, legs, feet	Ask questions Develop ideas of grouping, sequences, cause and effect Creating &Thinking Critically Know about similarities and differences Closely observes what animals, people and vehicles Make links and notice patterns in their experience Creating & Thinking Critically Create simple representations of events, people and objects Answer how and why questions about their experiences Make observations of animals and plants and explain why some things occur, and talk about changes
	Opportunities to be exposed to different science topics throughout the primary science curriculum, depending on child-initiated interest.	Ask questions Engage in open-ended activity Playing & Exploring Take a risk, engage in new experiences and learn by trial and error Playing & Exploring Find ways to solve problems / find new ways to do things / test their ideas Creating & Thinking Critically Make links and notice patterns in their experience Creating & Thinking Critically Choose the resources they need for their chosen activities Handle equipment and tools effectively Develop their own narratives and explanations by connecting ideas or events Builds up vocabulary that reflects the breadth of their experience

Year 1		
Plants	Know and name common wild and garden plants (including deciduous and evergreen trees). Know the basic structure of common flowering plants and trees.	Identify common plants and trees Compare plants and trees. Observe changes over time. Group/sort plants and trees Draw and label plants and trees. Ask questions (that can be investigated or researched).
Materials	Know the difference between an object and the material it is made from. Know the names of a variety of everyday materials, including wood, plastic, metal, water and rock. Know the simple properties of everyday materials. Know how some materials can be grouped on the basis of their simple physical properties.	Identify common materials. Compare common materials. Sort/classify common materials. Observe changes over time.
Animals including humans	Know and name a variety of common animals including fish, amphibians, reptiles, birds and mammals. Know and name a variety of common animals that are carnivore, herbivore and omnivore. Know and name the structure of common animals (fish, amphibians, reptiles, birds and mammals, including pets). Know basic parts of the human body. Know which parts of the body are associated with each sense.	Identify common animals. Compare common animals. Sort animals. Classify (according to what they eat) Draw and label. Observe animals. Observe changes over time. Identify patterns
Seasonal changes	Know there are 4 seasons. Know the types of weather associated with seasons. Know how day length varies.	Observe, describe, and compare seasonal characteristics & changes. Gather information. Record information. Report information. Ask questions (that can be investigated or researched).
Plants	Know and name common wild and garden plants (including deciduous and evergreen trees). Know the basic structure of common flowering plants and trees.	Identify common plants and trees Compare plants and trees. Observe changes over time. Group/sort plants and trees Draw and label plants and trees. Ask questions (that can be investigated or researched).

Year 2

Topic	Knowledge	Skills
Living Things and their habitats	Know the difference between things that are living, dead and things that have never been alive. Know that most living things live in a habitat to which they are suited. Know that different habits provide the basic needs of different animals and plants. Know how plants and animals depend on each other. Know the names of plants and animals and their habitat (including micro-habitats). Know how animals obtain their food from plants and other animals, using the idea of a simple food chain Know and name different sources of food.	Classify. Recognise (know) which animals live in which habitat. Use ideas to create e.g. simple food chain. Ask questions Collect evidence Record information. Notice patterns. Draw conclusion
Plants	Know how seeds and bulbs grow into mature plants. Know that plants need water, light and warmth to grow and stay healthy.	Name Identify plants. Observe plants, seeds, and bulbs. Groups plants Gather information Report on findings
Animals (including humans)	Know that animals, including humans, have offspring that grow into adults. Know the basic needs of animals, including humans (water, food, air). Know that exercise, eating the right amounts of different food and hygiene are important to humans.	Name. Describe. Identify. Ask questions. Research (using secondary sources). Explore e.g. use of exercise on the body.
Materials	Know the suitability of a variety of everyday materials (wood, metal, plastic, glass, brick, rock, paper and cardboard) for a particular use. Know that the shapes of solid objects can be changed by squashing, bending, twisting and stretching.	Identify different materials. Classify materials. Compare materials. Ask questions (that can be investigated or researched). Gather/record information Report on findings

Year 3

Topic	Knowledge	Skills	
Rocks	Know how different rocks can be compared and grouped according to appearance and simple properties. Know that fossils are formed when things that have lived are trapped within rock. Know that soils are made from rocks and organic matter.	Observe Describe Compare Research	Identify Group/classify Investigate (fair test)
Animals Including Humans	Know that animals, including humans: • need the right type and amount of nutrition • cannot make their own food • get nutrition from what they eat. Know that humans and some other animals have skeletons and muscles for support, protection, and movement.	Research Classify Compare Ask – enquiry questions Devise Investigate Identify (patterns)	
Forces and Magnets	Know that things move differently on different surfaces. Know that some forces need contact between 2 objects, but magnetic forces can act at a distance. Know some materials which are attracted to a magnet. Know that magnets have 2 poles. Know which poles will attract or repel.	Record data Devise (an investigation) Investigate	Explore Notice Sort/classify Measure e.g., strength of magnet
Light	Know that they need light to see things. Know that the dark is the absence of light. Know that light can be reflected from surfaces. Know that light from the sun can be dangerous and that there are ways to protect their eyes. Know that shadows are formed when the light from a light source is blocked by a solid object. Know that there are patterns in the way that the size of shadows changes.	Explore Observe Sort Measure Record Conclude Report Investigate	Notice (patterns) Describe Ask (questions to be investigated)
Plants	Know the functions of different parts of flowering plants: • Roots, stem/trunk • Leaves • Flowers Know the requirements of plants for life and growth: • Air • Light • Water • Nutrients from soil • Room to grow Know how water is transported in plants. Know the part played by flowers in the life cycle of a flowering plant (including pollinations, seed formation and seed dispersal).	Observe Notice Describe Classify Identify Predict Devise (set-up) Measure Record Report Present Research	

Year 4			
Topic	**Knowledge**	**Skills**	
Animals Including Humans: Digestion and Teeth	Know the basic parts of the digestive system in humans and their simple functions. Know the different types of teeth in humans and their simple functions. Know what a producer, predator and prey is. Know simple food chains.	Research Create/construct (a model) Observe Explore Identify	Describe Group/classify Record Investigate (fair test)
Living things and their habitats	Know that living things can be grouped Know some of the ways that living things can be grouped. Name a variety of living things in local and wider environment. Know some of the ways that environments can change. Know that change sometimes poses danger for living things.	Observe (over time) Compare Explore Notice Sort/classify Devise (an investigation) Investigate Record data Interpret results	
Sound	Know that some sounds are made by something vibrating. Know that vibrations from sounds travel through a medium to the ear. Know that the pitch of a sound is affected by the features of the object that produced it. Know that the stronger the vibration the louder the sound. Know that sounds get fainter as the distance from the source increases	Explore Observe Describe Classify (sources) Measure Notice (patterns)	Ask (questions to be investigated) Investigate Measure Record Conclude Report
Electricity	Know some common appliances that run on electricity. Know the parts of a simple series circuit, including cells, wires, bulbs, switches and buzzers. Know whether or not a bulb will light in a simple series circuit (based on whether or not the lamp is part of a complete loop with a battery). Know that a switch opens and closes a circuit (and this affects whether or not a lamp will light in a simple series circuit. Know some common conductors and insulators, and associate metals with being good conductors	Construct (circuits) Explore Classify Compare Ask - enquiry questions Devise	Investigate Discover Measure Record Conclude
Materials: States of Matter	Know that materials can be grouped into solids, liquids and gases. Know that some materials change state when they are heated or cooled. Know the temperature at which change of state occurs in degrees Celsius (°C) Know the part played by evaporation and condensation in the water cycle. Know that the rate of evaporation is associated with temperature.	Observe Explore Compare Notice Describe Classify Identify	Ask (questions) Devise Predict Measure Record Report

Year 5

Topic	Knowledge	Skills	
Properties and changes in materials	Know how materials can be grouped according to their properties, including, hardness, solubility, transparency, conductivity (electrical and thermal), and responses to magnets. Know that some materials will dissolve in liquid to form a solution. Know how to recover substances from a solution. Know how mixtures (of solids, liquids and gases) might be separated, including through filtering, sieving and evaporating. Know some particular uses of everyday materials, including metals, wood and plastic. Know that dissolving, mixing and changes of state are reversible changes. Know that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning, and the action of acid on bicarbonate of soda.	Compare Group/classify Give reasons Explain Separate Ask questions Devise Plan Predict Investigate Measure Record Interpret Conclude Ask (follow up questions)	
Earth & Space	Know how the Earth (and other planets) move in relation to the Sun Know how the moon moves in relation to the Earth. Know that the Sun, Earth and Moon are roughly spherical bodies. Know that day and night occur because of the rotation of the Earth. Know why the sun appears to move across the sky.	Observe Compare Group Research Explore Explain Give reasons	
Animals Including Humans	Know the changes humans go through as they develop to old age.	*(Some aspects to be taught through the RSE Curriculum)* Research Compare Sequence Record	
Plants	Know the life cycle of a flowering plant. Know how and why seeds are dispersed. Know what part a flower plays in the life cycle of flowering plants including pollination, seed formation and seed dispersal. Know the parts of a flowering plant including style, anther and filament.	Explore Notice Investigate Predict Sort Sequence	
Forces	Know that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object. Know the effect of air resistance, water resistance and friction on moving surfaces. Know that some mechanisms, including levers, pulleys, and gears, allow a smaller force to have a greater effect	Explore Notice Research Classify Devise Plan Predict Investigate Measure	Predict Observe Explain Fair test Invent Ask Record Interpret Conclude
Living things & their habitats	Know the differences in the life cycles of a mammal, an amphibian, an insect and a bird. Know the life process of reproduction in some plants and animals.	Describe Give reasons Observe	Classify Create Report Present

Year 6

Topic	Knowledge	Skills	
Evolution & inheritance	Know that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago. Know that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents. Know how animals and plants have adapted to suit their environment in different ways and that adaptation may lead to evolution.	Recognise Identify Explore Ask Research	Describe Compare Conclude Design
Animals Including Humans	Identify the main parts of the human circulatory system and know that the heart pumps blood in vessels around to the lungs. Know how blood is oxygenated. Know that diet, drugs, and exercise have an effect on the way our bodies work. Know how nutrients and water are transported within animals including humans.	Some aspects to be taught through the Sex and Relationships Curriculum. Research Compare Sequence Record	
Living things & their habitats	Know how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals. Know the reasons for classifying plants and animals based on specific characteristics.	Describe Classify Give reasons Observe Compare	
Forces	Know that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object. Know the effect of air resistance, water resistance and friction on moving surfaces. Know that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect	Explore Notice Research Classify Devise Plan	Predict Investigate Measure Record Interpret Conclude
Light	Know that light appears to travel in straight lines. Know that objects are seen because they give out or reflect light (which travels in straight lines) into the eye. Know that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes. Know that shadows have the same shape as the objects that cast them (because light travels in straight lines).	Recognise Explore Predict Compare (patterns) Observe Explain Fair test Ask (follow up questions)	
Electricity	Know that the brightness of a lamp or the volume of a buzzer is associated with the number and voltage of cells used in the circuit. Know that there are variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches. Know the symbols for components used in a series circuit.	Notice Compare Recognise Predict Observe	Use (symbols) Create (circuit) Explore Explain Fair test
		Invent (ways of measuring the brightness of a bulb) Ask (follow up questions)	

Our science knowledge and skills progression document ensures coverage of objectives from the National Curriculum and a range of scientific enquiry and working scientific skills.

ENQUIRY APPROACHES

Comparative / fair testing
Changing one variable to see its effect on another, whilst keeping all others the same.

Research
Using secondary sources of information to answer scientific questions.

Observation over time
Observing changes that occur over a period of time ranging from minutes to months.

Pattern-seeking
Identifying patterns and looking for relationships in enquiries where variables are difficult to control.

Identifying, grouping and classifying
Making observations to name, sort and organise items.

Problem-solving
Applying prior scientific knowledge to find answers to problems.

ENQUIRY SKILLS

Asking questions
Asking questions that can be answered using a scientific enquiry.

Making predictions
Using prior knowledge to suggest what will happen in an enquiry.

Setting up tests
Deciding on the method and equipment to use to carry out an enquiry.

Observing and measuring
Using senses and measuring equipment to make observations about the enquiry.

Recording data
Using tables, drawings and other means to note observations and measurements.

Interpreting and communicating results
Using information from the data to say what you found out.

Evaluating
Reflecting on the success of the enquiry approach and identifying further questions for enquiry.