

Science Non-Negotiable Key Skills, Knowledge and Vocabulary YEAR 4

National Curriculum:

Working Scientifically:

During year 4, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:

- asking relevant questions and using different types of scientific enquiries to answer them
- setting up simple practical enquiries, comparative and fair tests
- 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
- recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables
- reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions
- 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

Living Things and Habitats:

- 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
- recognise that environments can change and that this can sometimes pose dangers to living things

Animals including Humans:

- 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.

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 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.

Sound:

- 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.

Electricity:

- 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.

Key Concepts:

Working Scientifically: Use practical scientific methods, processes and skills to understand how ideas and theories are investigated and how this improves scientific knowledge and skills

Living things and habitats: Animals can be classified into groups dependent on their physical characteristics. Animals are affected by their habitats and this may cause them to change.

Animals including humans: All animals, including humans, share life processes, which allows them to adapt and grow.

States of matter: Materials, including solids, liquids and gases, change states in different ways.

Sound: Sound is produced by a source, which cause vibrations, which travel through a medium to the ear.

Electricity: Electricity is a useful form of energy, which flows through a complete circuit to make electrical appliances function.

Topic	Key Skills	Subject Knowledge	Key Vocabulary
Working scientifically	<ul style="list-style-type: none"> • Ask relevant questions. • Set up simple practical enquiries comparative and fair tests. • Make accurate measurements using standard units, using a range of equipment, for example thermometers and data loggers. 	<p>To know:</p> <ul style="list-style-type: none"> • What an appropriate question is • What an enquiry is • What to observe and measure in a fair test • How to control variable to conduct a fair test • How to use thermometers and data loggers • How to use a variety of classification keys • How to record and present data in a table, diagram, venn diagram or bar chart 	<p>Predict prediction aim purpose method apparatus equipment measure accurate reliable repeatable analyse diagram fair test relationship trend conclusion</p>

	<ul style="list-style-type: none"> Gather, record, classify and presenting data in a variety of ways to help in answering questions. Report on findings from enquiries, including oral and written explanations displays or presentations of results and conclusions. Use results to draw simple conclusions and suggest improvements, new questions and predictions for setting up further tests Identify differences, similarities or changes related to simple scientific ideas and processes. Record findings using simple scientific language, drawings, labelled diagrams, bar charts and tables. 	<ul style="list-style-type: none"> How to predict How to report finding in written and oral form How to use scientific language to explain and describe How to draw a conclusion based on aims How to relate scientific knowledge to findings How to begin to question results How to form a hypothesis How to evaluate the success of an investigation How to suggest improvements 	
Living things and their habitats	<p>Classify, group and compare (animals and plants in a variety of ways)</p> <p>Explore and use classification keys (group, identify and name a variety of living things in their local and wider environment)</p> <p>Recognise and investigate (environments can change and that this can sometimes pose dangers to living things)</p>	<p>To know:</p> <ul style="list-style-type: none"> Habitats change throughout the year Groups of animals (invertebrates – snails & slugs, worms, spiders, insects & vertebrates – fish, amphibians, mammals, reptiles, birds) Human can have positive or negatives impacts on the environment Changes to the environment can impact living things within it 	<p>Climate weather temperature classify humidify shelter conditions adapt adaptation species invertebrate vertebrate bird reptile mammal amphibian fish</p>
Animals including humans	<p>Identify, compare and explore (different types of teeth in humans; their simple functions and how they can be damaged)</p> <p>Construct and interpret (a variety of food chains, identifying producers, predators and prey)</p>	<p>To know:</p> <ul style="list-style-type: none"> Simple functions of the basic parts of the digestive system in humans Parts of the digestive system (mouth, tongue, teeth, oesophagus, stomach, intestine) Functions of teeth Difference between the teeth of carnivores and herbivores 	<p>Stomach intestines gullet anus mouth liver canine molar premolar incisor saliva digest producer predator prey decay fibre sugar carbohydrate fat protein vitamins minerals</p>

		<ul style="list-style-type: none"> How to keep teeth healthy 	
States of matter	<p>Compare and group (materials together, according to whether they are solids, liquids or gases)</p> <p>Observe and investigate (how materials change state when they are heated or cooled)</p> <p>Measure and research (temperature at which this happens in degrees Celsius)</p> <p>Investigate and explain (evaporation and condensation in the water cycle and associate the rate of evaporation with temperature).</p>	<p>To know:</p> <ul style="list-style-type: none"> Characteristics of different states of matter (particles within solids, liquids, gases) The names of the changing states of water How water changes state How to classify common materials Some materials change states (at different temperatures e.g. from a solid to a liquid) How to measure temperature using a thermometer The different stages in the water cycle How evaporation is useful 	<p>Solid liquid gas state melting boiling evaporation condensation water cycle temperature thermometer degrees Celsius (°C)</p>
Sound	<p>Identify and explore patterns (between the pitch/volume of a sound and features of the object that produced it)</p> <p>Investigate and recognise (sounds get fainter as the distance from the sound source increases)</p>	<p>To know:</p> <ul style="list-style-type: none"> How sounds are made, associating some of them with something vibrating Vibrations from sounds travel through a medium to the ear How the pitch and volume of sound can be changed in variety of ways How different materials can have different sound-proofing qualities 	<p>Vibration pitch sound wave volume frequency medium auditory particle sound source ear drum vibrate cochlea hammer anvil stirrup auditory nerve brain amplitude transmit absorb</p>
Electricity	<p>Construct and evaluate (electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers)</p> <p>Predict and 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)</p>	<p>To know:</p> <ul style="list-style-type: none"> Common appliances that run on electricity How to draw a simple circuit, using recognised symbols A switch opens and closes a circuit That some materials are conductors and some are insulators Some metals are good conductors 	<p>Conductor insulator switch lamp circuit electricity buzzer brightness dim metal plastic cells wires fuse shock safety</p>

Observe (whether or not a lamp lights in a simple series circuit dependent on the switch position)

Test and classify (some common conductors and insulators, and associate metals with being good conductors)