

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. 	To know: <ul style="list-style-type: none"> • What an appropriate question is • What an enquiry is 	Predict prediction aim purpose method apparatus equipment measure accurate



	<ul style="list-style-type: none"> • Make accurate measurements using standard units, using a range of equipment, for example thermometers and data loggers. • 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"> • 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 • 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 	<p>reliable repeatable analyse diagram fair test relationship trend conclusion</p>
<p>Living things and their habitats</p>	<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>



<p>Animals including humans</p>	<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 • How to keep teeth healthy 	<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>
<p>States of matter</p>	<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>
<p>Sound</p>	<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>Observe (whether or not a lamp lights in a simple series circuit dependent on the switch position)</p> <p>Test and classify (some common conductors and insulators, and associate metals with being good conductors)</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>
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