

Science Non-Negotiable Key Skills, Knowledge and Vocabulary YEAR 3

National Curriculum:

Working Scientifically:

During years 3, 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

Plants:

- identify and describe the functions of different parts of flowering plants: 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
- explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal

Animals including humans:

- 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.

Rocks:

- compare and group together different kinds of rocks on the basis of their appearance and simple physical properties
- describe in simple terms how fossils are formed when things that have lived are trapped within rock
- recognise that soils are made from rocks and organic matter.

Light:

- 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 an opaque object
- find patterns in the way that the size of shadows change.

Forces and magnets:

- 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.

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

Plants: Plants are living organisms that require specific conditions to adapt and grow.

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

Rocks: Rocks are formed through different physical processes, which determines their properties and characteristics (including how fossils are formed).

Light: Some objects are sources of light, which we need in order to see, however the absence of light is dark.

Forces and magnets: Forces affect the movement of objects.

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 a measuring cylinders and a data logger • How to record and present data in a table, 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 	<p>reliable repeatable analyse diagram fair test relationship trend conclusion</p>
Plants	<p>Identify and describe (functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers)</p> <p>Explore (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)</p> <p>Investigate (how water is transported within plants)</p>	<p>To know:</p> <ul style="list-style-type: none"> • Parts of a plant and their functions • Plants need light, water and space to grow • Plants have adaptations in order for them to survive in different environments • Plants take water in through their roots and this is transpired through their leaves • Plants reproduce through sexual reproduction involving flowers to produce seeds, which are dispersed using different methods (wind, insect, etc.) 	<p>Plant roots stem trunk leaf/leaves flower stalk veins surface edge tip food root hair nutrients anchor support seed germination seedling growth mature plant flowering pollination seed formation bud petal pollen nectar seed fruit</p>



	Explore (flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal)		
Animals including humans	<p>Identify (animals, including humans, need the right types and amount of nutrition)</p> <p>Investigate using secondary research (how animals, including humans, cannot make their own food; they get nutrition from what they eat)</p> <p>Identify (humans and some other animals have skeletons and muscles for support, protection and movement).</p>	<p>To know:</p> <ul style="list-style-type: none"> All animals require nutrition from different sources to survive (omnivores, carnivores, herbivores) Different food groups Importance of a balanced diet Different types of skeletons (exo, endo, etc) Functions of skeletons, including joints (protection, movement, support) Functions of muscles (protection, movement, support) 	<p>Nutrition diet food protein carbohydrate minerals vitamins fats sugars salts balanced diet skeleton skull spine vertebrate invertebrate calcium muscle contract relax pairs movement</p>
Rocks	<p>Compare and group together (different kinds of rocks on the basis of their appearance and simple physical properties)</p> <p>Describe in simple terms (fossils are formed when things that have lived are trapped within rock)</p> <p>Recognise (soils are made from rocks and organic matter)</p>	<p>To know:</p> <ul style="list-style-type: none"> Rocks are sedimentary, igneous or metamorphic and are formed in different ways and have different characteristics and properties Fossils are formed when things that have lived are trapped within rock Soils are made from rocks and organic matter and have different characteristics and properties. 	<p>Waterproof strong hard opaque heavy sedimentary igneous metamorphic porous fossil layers erosion soil inner core outer core mantle crust earthquake volcano pebble boulder crystal weathering</p>
Light	<p>Recognise (light is needed in order to see things and that dark is the absence of light)</p> <p>Notice and investigate (how light is reflected from surfaces)</p> <p>Investigate and identify patterns (how shadows are formed)</p>	<p>To know:</p> <ul style="list-style-type: none"> Light is reflected from surfaces Dark is the absence of light Shadows are formed when the light from a light source are blocked from a solid object Shadows change according to the position of the light source 	<p>Light dark absence reflection surface natural man-made light source shadow blocked bright dim mirror absorb plane mirror concave mirror convex mirror image</p>



		<ul style="list-style-type: none">• Light from the sun can be dangerous• How to protect from the sun.	
Forces and magnets	<p>Compare (how things move on different surfaces)</p> <p>Notice (forces need contact between two objects, but magnetic forces can act at a distance)</p> <p>Observe (how magnets attract or repel each other and attract some materials and not others describe magnets as having two poles)</p>	<ul style="list-style-type: none">• Different surfaces create different amounts of friction.• Magnetic fields affect objects.• Magnetic forces work from a distance.• Magnets attract and repel.• Some materials are not magnetic.	Force surface magnet magnetic force attract repel magnetic material poles bar magnet horseshoe magnet materials contact non-contact north pole south pole magnetic field iron iron filings