

## Year 3 Science Curriculum

### Rocks

#### Prior learning:

Distinguish between an object and the material from which it is made. (Y1 - Everyday materials)

Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock. (Y1 - Everyday materials)

Describe the simple physical properties of a variety of everyday materials. (Y1 - Everyday materials)

Compare and group together a variety of everyday materials on the basis of their simple physical properties. (Y1 - Everyday materials)

Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses. (Y2 - Uses of everyday materials)

#### Common misconceptions

Some children may think:

- rocks are all hard in nature
- rock-like, man-made substances such as concrete or brick are rocks
- materials which have been polished or shaped for use, such as a granite worktop, are not rocks as they are no longer 'natural'
- certain found artefacts, like old bits of pottery or coins, are fossils
- a fossil is an actual piece of the extinct animal or plant
- soil and compost are the same thing.

#### Reading Opportunities

Ug - Raymond Briggs

Stone Age Boy - Satoshi Kitamura









Rhoda's Rock Hunt - Molly Beth

Pebble In My Pocket - Meredith Hooper

#### Vocabulary

rock, stone, pebble, grain, crystals, layers, hard, soft, texture, absorb water, fossil, bone, flesh, minerals, marble, chalk, granite, sandstone, slate, soil, types of soil (e.g. peaty, sandy, chalk, clay)

## Rocks

National Curriculum Principles	Knowledge and key Vocabulary	Activities and Working scientifically
<p>To compare and group together different kinds of rocks on the basis of their experiences and simple physical properties</p>	<p>Rock is a naturally occurring material. There are different types of rock e.g. sandstone, limestone, slate etc. which have different properties. Rocks can be hard or soft. They have different sizes of grain or crystal. They may absorb water. Rocks can be different shapes and sizes (stones, pebbles, boulders)</p>	<p>Observe rocks closely using magnifying glasses</p>
		<p>Identify and name types of rock e.g. granite, marble, chalk, slate, sandstone, pumice. </p>
		<p>Classify rocks based on appearance. Use vocabulary inc. texture, grain, crystals, layers, hard, soft, smooth, rough </p>
		<p>Devise a comparative test to investigate the hardness of rock </p>
		<p>Devise a comparative test to investigate how much water a rock absorbs </p>
		<p>Use data to rank suitability of rocks for different purposes </p>
<p>To describe in simple terms how fossils are formed when things that have lived are trapped within a rock</p>	<p>Some rocks contain fossils. Fossils were formed millions of years ago. When plants and animals died, they fell to the seabed. They became covered and squashed by other material. Over time the dissolving animal and plant matter is replaced by minerals from the water.</p>	<p>Research how fossils are formed and present findings in different ways </p>
<p>To recognise that soils are made from rocks and organic matter</p>	<p>Soils are made up of pieces of ground down rock which may be mixed with plant and animal material (organic matter). The type of rock, size of rock pieces and the amount of organic matter affect the property of the soil.</p>	<p>Observe soils closely</p>
		<p>Classify soils based on appearance </p>
		<p>Separate soil using sedimentation </p>
		<p>Identify constituent parts of soil</p>

## Plants

### Prior learning:

Observe and describe how seeds and bulbs grow into mature plants. (Y2 - Plants)

Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy. (Y2 - Plants)

### Common misconceptions

Some children may think:

- plants eat food
- food comes from the soil via the roots
- flowers are merely decorative rather than a vital part of the life cycle in reproduction
- plants only need sunlight to keep them warm
- roots suck in water which is then sucked up the stem.

### Reading Opportunities






The Hidden Forest - Jeannie Baker

George and Flora's Secret Garden - Jo Elworthy

### Vocabulary

photosynthesis, pollen, insect/wind pollination, male, female, seed formation, seed dispersal (wind dispersal, animal dispersal, water dispersal), air, nutrients, minerals, soil, absorb, transport

## Plants

National Curriculum Principles	Knowledge and key Vocabulary	Activities and Working scientifically
<p>Pupils should be taught to: Identify and describe the functions of different parts of flowering plants, roots, stem/trunk, leaves and flowers</p>	<p>Identify roots, stem/trunk, leaves and flowers and describe their function.            Roots - carry water/nutrients to stem, anchor plant.            Trunk/Stem - keeps plants upright, carries water and nutrients to different parts of a plant.            Flower - reproduction of plant, attracts pollinators            Leaves - make food for plant from the sun's energy by photosynthesis</p>	<p>Observe what happens to plants over time when leaves or roots are removed</p> 
		<p>Communicate and interpret the results</p>
<p>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</p>	<p>Different plants require different conditions for germination and growth.</p>	<p>Investigate what happens to plants in different conditions e.g. in darkness, in the cold, deprived of air, different types of soil, different fertilisers, varying amount of space.</p> 
<p>Investigate the way in which water is transported within plants</p>	<p>Plants absorb water through their roots and the stem carries water and nutrients to the rest of the plant.</p>	<p>Observe the effect of putting white flowers in coloured water.</p> 
<p>Explore the part that flowers play in the life cycle</p>	<p>Pollen, which is produced by the male part of the flower, is transferred to the female part of other flowers (pollination). Describe wind pollination and insect pollination. This forms seeds, sometimes contained in berries or fruits which are then dispersed in different ways.</p>	<p>Research different types of seed dispersal</p> 
		<p>Classify seeds in different ways inc by how they are dispersed.</p> 
		<p>Observe flowers to identify the pollen</p>
		<p>Observe flowers being visited by pollinators</p>

## Light

### Prior learning:

Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense. (Y1 - Animals, including humans)

Describe the simple physical properties of a variety of everyday materials. (Y1 - Materials)

### Common misconceptions

Some children may think:

- we can still see even where there is an absence of any light
- our eyes 'get used to' the dark
- the moon and reflective surfaces are light sources
- a transparent object is a light source
- shadows contain details of the object, such as facial features on their own shadow
- shadows result from objects giving off darkness.

### Reading Opportunities

The Owl Who Was Afraid of the Dark - Jill Tomlinson







The Dark - Lemony Snicket

The Firework-Maker's Daughter - Philip Pullman

### Vocabulary

light, light source, Sun, sunlight, dangerous

## Light

National Curriculum Principles	Knowledge and key Vocabulary	Activities and Working scientifically
Pupils should be taught to recognise that they need light in order to see things and that dark is the absence of light	We see objects because our eyes can sense light. Dark is the absence of light. We cannot see anything in complete darkness. Objects are easier to see if there is more light.	Use an object hidden in a cardboard box with an eyehole - can they see the object in the dark? Explore how objects are more or less visible in different levels of light.
	Some objects, for example, the sun, light bulbs and candles are sources of light.	Sort light sources into natural and man made. 
Notice that light is reflected from surfaces	All surfaces reflect light to some degree. Objects are easier to see when there is less light if they are reflective.	Sort objects according to whether they are sources of light or reflect light. 
Recognise that light from the sun can be dangerous and that there are ways to protect their eyes	The light from the sun can damage our eyes and therefore we should not look directly at the sun and can protect our eyes by wearing sunglasses or sunhats in bright light.	Comparative test of suncreams/sunglasses using uv beads. 
Recognise that shadows are formed when the light from a light source is blocked by an opaque object	Shadows are formed on a surface when an opaque or translucent object is between a light source and the surface and blocks some of the light.	Compare shadows from opaque, translucent and transparent object 
Find patterns in the way that the size of shadows change	The size of the shadow depends on the position of the source, object and surface.	Explore how shadows vary as the distance between a light source and an object or surface is changed. 
		Children to choose and evaluate suitable materials to make shadow puppets 

## Forces and Magnets

### Prior learning:

Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. (Y2 - Uses of everyday materials)

### Common misconceptions

Some children may think:

- the bigger the magnet the stronger it is
- all metals are magnetic.

### Reading Opportunities

The Iron Man - Ted Hughes








Mrs Armitage: Queen of the Road - Quentin Blake

Mr Archimedes' Bath - Pamela Allen

### Vocabulary

Force, push, pull, twist, contact force, non-contact force, magnetic force, magnet, strength, attract, repel, magnetic material, metal, iron, steel, poles, north pole, south pole

## Forces and magnets

National Curriculum Principles	Knowledge and key Vocabulary	Activities and Working scientifically
Compare how things move on different surfaces	A force is a push or a pull. Forces will decide the motion of an object. Push and pull forces can make things start and stop moving. When an object moves on a surface, the texture of the surface and the object affect how it moves. It may help the object to move better or it may hinder its movement e.g. ice skating compared to walking on ice in normal shoes.	Explore how simple objects/toys move on different surfaces - e.g. spinning coins, rolling balls and clockwork toys. 
		Use results to raise further questions and predict how objects will move on different surfaces
		Comparative test of force needed to move a trainer on different surfaces. Measure using newton meter 
Notice that some forces need contact between 2 objects, but magnetic forces can act at a distance	For some forces to act, there must be contact e.g. a hand opening a door, the wind pushing the trees. Some forces can act at a distance e.g. magnetism. The magnet does not need to touch the object that it attracts.	Observe forces around school and classify them as contact or non contact 
Observe how magnets attract or repel each other and attract some materials but not others	A magnet attracts magnetic material.	Explore the classroom with magnets. Predict which objects will be magnetic and then test and sort objects according to results 
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	Iron and nickel and other materials containing these, e.g. stainless steel, are magnetic	Interpret results and carry out additional research to decide which materials are magnetic and which are not. 
Describe magnets as having 2 poles	The strongest parts of a magnet are the poles. Magnets have two poles – a north pole and a south pole.	Draw diagrams to show attraction and repulsion between the poles of the magnets
Predict whether 2 magnets will attract or repel each other, depending on which poles are facing	If two like poles, e.g. two north poles, are brought together they will push away from each other – repel. If two unlike poles, e.g. a north and south, are brought together they will pull together – attract.	Ask questions and plan how to compare the strength of different magnet 
		Carry out the investigation focusing on how to set it up 



## Animals inc Humans

### **Prior learning:**

Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals. (Y1 - Animals, including humans)

Identify and name a variety of common animals that are carnivores, herbivores and omnivores. (Y1 - Animals, including humans)

Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets). (Y1 - Animals, including humans)

Find out about and describe the basic needs of animals, including humans, for survival (water, food and air). (Y2 - Animals, including humans)

Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene. (Y2 - Animals, including humans)

### Common misconceptions

Some children may think:

- certain whole food groups like fats are ‘bad’ for you
- certain specific foods, like cheese are also ‘bad’ for you
- diet and fruit drinks are ‘good’ for you
- snakes are similar to worms, so they must also be invertebrates
- invertebrates have no form of skeleton.

### Reading Opportunities

The Story of Frog Belly Rat Bone - Timothy Basil Ering






Funnybones - Janet and Allan Ahlberg

I Will Never Not Ever Eat a Tomato - Lauren Child

### Vocabulary

Nutrition, nutrients, carbohydrates, sugars, protein, vitamins, minerals, fibre, fat, water, skeleton, bones, muscles, joints, support, protect, move, skull, ribs, spine, femur

## Animals including humans

National Curriculum Principles	Knowledge and key Vocabulary	Activities and Working scientifically
<p>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.</p>	<p>Animals, unlike plants which can make their own food, need to eat in order to get the nutrients they need.</p>	<p>Classify foods according to whether they are high or low in particular nutrients </p>
	<p>Food contains a range of different nutrients - carbohydrates (including sugars), protein, vitamins, minerals, fats, sugars, water - and fibre that are needed by the body to stay healthy. A piece of food will often provide a range of nutrients.</p>	<p>Use food labels to ask and answer enquiry questions e.g how much sugar do different soft drinks have </p>
		<p>Plan a daily diet to have a good balance of nutrients</p>
		<p>Research the nutrients in fast food </p>
<p>Identify that humans and some other animals have skeletons and muscles for support, protection and movement</p>	<p>Humans and some other animals have skeletons for support and protection</p>	<p>Pre assess - make skeleton out of dog biscuits and label.</p>
		<p>Name and label skull, spine, ribs, femur. </p>
		<p>Compare human skeleton to other animals and identify named bones on other animals.</p>
	<p>Humans and some other animals have muscles to help them move.</p>	<p>Comparative test - can children with longer legs jump further </p>

## Working scientifically in Year 3 and 4

### Asking questions

The children consider their prior knowledge when asking questions. They independently use a range of question stems. Where appropriate, they answer these questions. The children answer questions posed by the teacher. Given a range of resources, the children decide for themselves how to gather evidence to answer the question. They recognise when secondary sources can be used to answer questions that cannot be answered through practical work. They identify the type of enquiry that they have chosen to answer their question

### Set up enquiries

The children select from a range of practical resources to gather evidence to answer questions generated by themselves or the teacher. • They follow their plan to carry out different types of enquiry inc. observations and tests to classify; comparative and simple fair tests; observations over time; and pattern seeking

Explanatory note A comparative test is performed by changing a variable that is qualitative e.g. the type of material, shape of the parachute. This leads to a ranked outcome. A fair test is performed by changing a variable that is quantitative e.g. the thickness of the material or the area of the canopy. This leads to establishing a causative relationship.

### Making observations and measurements

The children make systematic and careful observations. They use a range of equipment for measuring length, time, temperature and capacity inc thermometers and data loggers. They use standard units for their measurements.

### Recording evidence

The children sometimes decide how to record and present evidence. They record their observation e.g. using photographs, videos, pictures, labelled diagrams or writing. They record their measurements e.g. using tables, tally charts and bar charts (given templates, if required, to which they can add headings). They record classifications e.g. using tables, Venn diagrams, Carroll diagrams. Children are supported to present the same data in different ways in order to help with answering the question.

### Interpret and report

Ch can identify differences, similarities or changes related to simple scientific ideas and processes. Children interpret their data to generate simple comparative statements based on their evidence. They begin to identify naturally occurring patterns and causal relationships.


### Evaluate

Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions. They identify ways in which they adapted their method as they progressed or how they would do it differently if they repeated the enquiry.

# Working Scientifically Skills



# Science Enquiry Types

Comparative and fair testing	
Research	
Observation over time	
Pattern seeking	
Identifying and classifying	
Problem solving	

