

Subject - Science

Topic name - Animals, including humans

Year group 3

Term - Spring

## Prior Knowledge

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)

## Skills to be taught

Asking relevant questions and using different types of scientific enquiries to answer them  
 Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and dataloggers  
 Setting up simple practical enquiries, comparative and fair tests

## Key Knowledge

Animals, unlike plants which can make their own food, need to eat in order to get the nutrients they need. 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.

Humans, and some other animals, have skeletons and muscles which help them move and provide protection and support.

Key Vocabulary	
<b>healthy</b>	in a good physical and mental condition
<b>nutrients</b>	substances that living things need to stay alive and healthy
<b>energy</b>	strength to be able to move and grow
<b>saturated fats</b>	types of fats, considered to be less healthy, that should only be eaten in small amounts
<b>unsaturated fats</b>	fats that give you energy, vitamins and minerals

• Living things need food to grow and to be strong and <b>healthy</b> .
• Plants can make their own food, but animals cannot.
• To stay <b>healthy</b> , humans need to exercise, eat a <b>healthy</b> diet and be hygienic.
• Animals, including humans, need food, water and air to stay alive.

Key Vocabulary	
<b>vertebrate</b>	animals with backbones
<b>invertebrate</b>	animals without backbones
<b>muscles</b>	soft tissues in the body that contract and relax to cause movement
<b>tendons</b>	cords that join muscles to bones
<b>joints</b>	areas where two or more bones are fitted together

## Pictures/maps/images

Nutrient	Found in... (examples)	What it does/they do
carbohydrates		provide <b>energy</b>
protein		helps growth and repair
fibre		helps you to digest the food that you have eaten
fats		provide <b>energy</b>
vitamins		keep you <b>healthy</b>
minerals		keep you <b>healthy</b>
water		moves <b>nutrients</b> around your body and helps to get rid of waste

## Possible experiences

Classify food in a range of ways. Use food labels to explore the nutritional content of a range of food items. Use secondary sources to find out the types of food that contain the different nutrients. Use food labels to answer enquiry questions e.g. How much fat do different types of pizza contain? How much sugar is in soft drinks? Plan a daily diet to contain a good balance of nutrients. Explore the nutrients contained in fast food. Use secondary sources to research the parts and functions of the skeleton. Investigate patterns asking questions such as: § Can people with longer legs run faster? § Can people with bigger hands catch a ball better? Compare, contrast and classify skeletons of different animals

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Skeletons do three important jobs:

- protect organs inside the body;
- allow movement;
- support the body and stop it from falling on the floor.

Skeletal **muscles** work in pairs to move the bones they are attached to by taking turns to contract (get shorter) and relax (get longer).

contract

relax

vertebrate

↓

endoskeleton

invertebrate

↓

exoskeleton

hydrostatic skeleton

skull

clavicle

scapula

humerus

ribcage

vertebral column

ulna

radius

pelvis

femur

tibia

fibula

Subject - Science

Topic name - Forces and magnets

Year group 3

Term - Autumn 1

## Prior Knowledge

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)

## Skills to be taught

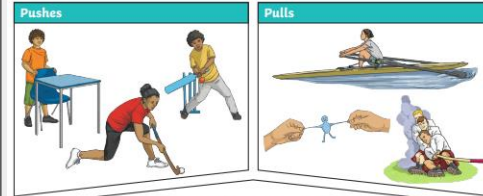
Asking relevant questions and using different types of scientific enquiries to answer them  
 Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and dataloggers  
 Setting up simple practical enquiries, comparative and fair tests

## Key Knowledge

A force is a push or a pull. 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 skater compared to walking on ice in normal shoes.  
 A magnet attracts magnetic material. Iron and nickel and other materials containing these, e.g. stainless steel, are magnetic. The strongest parts of a magnet are the poles. Magnets have two poles – a north pole and a south pole. 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.  
 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.

Key Vocabulary		magnet
forces	Pushes or pulls.	An object which produces a <b>magnetic force</b> that pulls certain objects towards it.
friction	A <b>force</b> that acts between two <b>surfaces</b> or objects that are moving, or trying to move, across each other.	Objects which are attracted to a <b>magnet</b> are <b>magnetic</b> . Objects containing iron, nickel or cobalt metals are <b>magnetic</b> .
surface	The top layer of something.	<b>magnetic field</b> The area around a <b>magnet</b> where there is a <b>magnetic force</b> which will pull <b>magnetic</b> objects towards the <b>magnet</b> .
		<b>poles</b> North and south <b>poles</b> are found at different ends of a <b>magnet</b> .
		<b>repel</b> Repulsion is a <b>force</b> that pushes objects away. For example, when a north <b>pole</b> is placed near the north <b>pole</b> of another <b>magnet</b> , the two <b>poles</b> repel (push away from each other).
		<b>attract</b> Attraction is a <b>force</b> that pulls objects together. For example, when a north <b>pole</b> is placed near the south <b>pole</b> of another <b>magnet</b> , the two <b>poles</b> attract (pull together).

## Pictures/maps/images



Forces will change the motion of an object. They will either make it start to move, speed up, slow it down or even make it stop.

**Key Knowledge**

Like **poles** repel.  
Opposite **poles** attract.

A **magnetic field** is invisible. You can see the **magnetic field** here though. This is what happens when iron filings are placed on top of a piece of paper with a **magnet** underneath.

The needle in a compass is a **magnet**. A compass always points north-south on Earth.

## Possible experiences

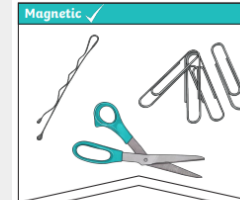
Carry out investigations to explore how objects move on different surfaces e.g. spinning tops/coins, rolling balls/cars, clockwork toys, soles of shoes etc. Explore what materials are attracted to a magnet. Classify materials according to whether they are magnetic. Explore the way that magnets behave in relation to each other. Use a marked magnet to find the unmarked poles on other types of magnets. Explore how magnets work at a distance e.g. through the table, in water, jumping paper clips up off the table. Devise an investigation to test the strength of magnets.

## Key Knowledge

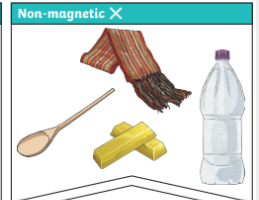
Different **surfaces** create different amounts of **friction**. The amount of **friction** created by an object moving over a **surface** depends on the roughness of the **surface** and the object, and the **force** between them.

The driving **force** pushes the bicycle, making it move.

**Friction** pushes on the bicycle, slowing it down.



These objects contain iron, nickel or cobalt. Not all metals are **magnetic**.



These objects do not contain iron, nickel or cobalt.

Subject - Science	Topic name - Light	Year group 3	Term - Autumn
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## Prior Knowledge

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)

## Skills to be taught

Asking relevant questions and using different types of scientific enquiries to answer them  
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## Key Knowledge

We see objects because our eyes can sense light. Dark is the absence of light. We cannot see anything in complete darkness. Some objects, for example, the sun, light bulbs and candles are sources of light. Objects are easier to see if there is more light. Some surfaces reflect light. Objects are easier to see when there is less light if they are reflective.  
 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.  
 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. The size of the shadow depends on the position of the source, object and surface.

Key Vocabulary	
<b>light</b>	A form of energy that travels in a wave from a source.
<b>light source</b>	An object that makes its own light.
<b>dark</b>	Dark is the absence of light.
<b>reflection</b>	The process where light hits the surface of an object and bounces back into our eyes.
<b>reflect</b>	To bounce off.
<b>reflective</b>	A word to describe something which reflects light well.
<b>ray</b>	Waves of light are called light rays. They can also be called beams.

## Pictures/maps/images

**Key Knowledge**

A shadow is caused when light is blocked by an opaque object. A shadow is larger when an object is closer to the light source. This is because it blocks more of the light.

The pupils control the amount of light entering the eyes. If too much light enters, then it can damage the retina. To help protect the eyes, you can wear a hat with a wide brim and sunglasses with a UV rating.

When a light source is to one side of an object, the shadow will appear on the opposite side. The shadow will also be longer.

When the light source is directly above the object, the shadow will be directly underneath.

mirrors reflect light very well, so they create a clear image. An image in a mirror appears to be reversed. For example, if you look in a mirror and raise your right hand, the mirror image appears to raise its left hand.

**Possible experiences** Explore how different objects are more or less visible in different levels of lighting. Explore how objects with different surfaces (e.g. shiny vs matt) are more or less visible. Explore how shadows vary as the distance between a light source and an object or surface is changed. Explore shadows which are connected to and disconnected from the object e.g. shadows of clouds and children in the playground. Choose suitable materials to make shadow puppets. Create artwork using shadows.

**Key Knowledge**

We need light to be able to see things. Light travels in a straight line. When light hits an object, it is reflected (bounces off). If the reflected light hits our eyes, we can see the object. Some surfaces and materials reflect light well. Other materials do not reflect light well. Reflective surfaces and materials can be very useful...

The surfaces that reflect light best are smooth, shiny and flat.

A smooth, shiny, flat surface.

A rough and uneven surface.

**opaque**

**translucent**

**transparent**

Subject - Science

Topic name - Plants

Year group 3

Term - Summer

## Prior Knowledge

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)

## Key vocabulary

Key Vocabulary	
<b>roots</b>	These anchor the plant into the ground and absorb water and <b>nutrients</b> from the soil.
<b>stem</b>	This holds the plant up and carries water and <b>nutrients</b> from the soil to the <b>leaves</b> . A trunk is the <b>stem</b> of a tree.
<b>leaves</b>	These make food for the plant using sunlight and carbon dioxide from the air.
<b>flowers</b>	These make seeds to grow into new plants. Their <b>petals</b> attract <b>pollinators</b> to the plant.
<b>nutrients</b>	These substances are needed by living things to grow and survive. Plants get <b>nutrients</b> from the soil and also make their own food in their <b>leaves</b> .
<b>evaporation</b>	When a liquid turns into a gas.

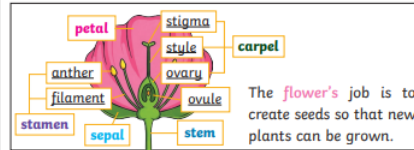
## Possible experiences

Observe what happens to plants over time when the leaves or roots are removed.  
 Observe the effect of putting cut white carnations or celery in coloured water.  
 Investigate what happens to plants when they are put in different conditions e.g. in darkness, in the cold, deprived of air, different types of soil, different fertilisers, varying amount of space.  
 Spot flowers, seeds, berries and fruits outside throughout the year.  
 Observe flowers carefully to identify the pollen.  
 Observe flowers being visited by pollinators e.g. bees and butterflies in the summer.  
 Observe seeds being blown from the trees e.g. sycamore seeds.  
 Research different types of seed dispersal.  
 Classify seeds in a range of ways, including by how they are dispersed.  
 Create a new species of flowering plant

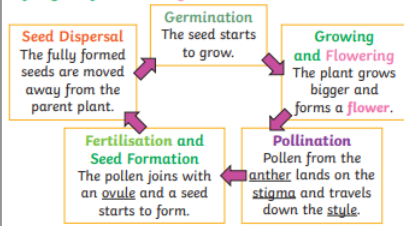
## Skills to be taught

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## Pictures/maps/images



### Life Cycle of a Flowering Plant

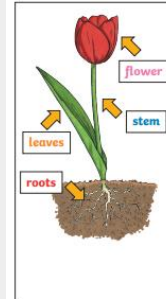


### Seed Dispersal



## Key Knowledge

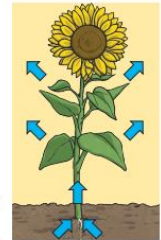
Many plants, but not all, have roots, stems/trunks, leaves and flowers/blossom. The roots absorb water and nutrients from the soil and anchor the plant in place. The stem transports water and nutrients/minerals around the plant and holds the leaves and flowers up in the air to enhance photosynthesis, pollination and seed dispersal. The leaves use sunlight and water to produce the plant's food. Some plants produce flowers which enable the plant to reproduce. Pollen, which is produced by the male part of the flower, is transferred to the female part of other flowers (pollination). This forms seeds, sometimes contained in berries or fruits which are then dispersed in different ways. Different plants require different conditions for germination and growth.



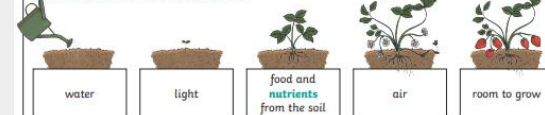
### How Water Moves through a Plant

1. The **roots** absorb water from the soil.
2. The **stem** transports water to the **leaves**.
3. Water **evaporates** from the **leaves**.
4. This **evaporation** causes more water to be sucked up the **stem**.

The water is sucked up the **stem** like water being sucked up through a straw.



### What Does a Plant Need to Grow?



Different plants vary in how much of these things they need. For example, cacti can survive in areas with little water, whereas water lilies need to live in water.

Subject - Science	Topic name - Rocks	Year group 3	Term - Spring
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**Prior Knowledge** 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)

Key Vocabulary	
<b>igneous rock</b>	Rock that has been formed from <b>magma</b> or <b>lava</b> .
<b>sedimentary rock</b>	Rock that has been formed by layers of <b>sediment</b> being pressed down hard and sticking together. You can see the layers of <b>sediment</b> in the rock.
<b>metamorphic rock</b>	Rock that started out as <b>igneous</b> or <b>sedimentary rock</b> but changed due to being exposed to extreme heat or pressure.
<b>magma</b>	Molten rock that remains underground.
<b>lava</b>	Molten rock that comes out of the ground is called <b>lava</b> .
<b>sediment</b>	Natural solid material that is moved and dropped off in a new place by water or wind, e.g. sand.
<b>permeable</b>	Allows liquids to pass through it.
<b>impermeable</b>	Does not allow liquids to pass through it.

**Possible experiences** Observe rocks closely.  
 Classify rocks in a range of ways, based on their appearance.  
 Devise a test to investigate the hardness of a range of rocks.  
 Devise a test to investigate how much water different rocks absorb.  
 Observe how rocks change over time e.g. gravestones or old building.  
 Research using secondary sources how fossils are formed.  
 Observe soils closely.  
 Classify soils in a range of ways based on their appearance.  
 Devise a test to investigate the water retention of soils.  
 Observe how soil can be separated through sedimentation.  
 Research the work of Mary Anning.

**Skills to be taught**  
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**Key Vocabulary**

There are three types of naturally occurring rock.

Natural Rocks			Human-Made Rocks
Igneous	Sedimentary	Metamorphic	
Obsidian	Chalk	Marble	Brick
Granite	Sandstone	Quartzite	Concrete
Basalt	Limestone	Slate	Coade Stone

Some words you might use to discuss the properties of a rock:  
 hard, soft, **permeable**, impermeable, durable (meaning resistant to weathering), high density, low density. Density measures how 'bulky' the rock is (how tightly packed the molecules are).

**Key Knowledge**  
 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). 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.

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.

Key Vocabulary		Key Knowledge	
<b>fossilisation</b>	The process by which fossils are made.	<p>Soil is the uppermost layer of the Earth. It is a mixture of different things:</p> <ul style="list-style-type: none"> <li>minerals (the minerals in soil come from finely broken-down rock);</li> <li>air;</li> <li>water;</li> <li>organic matter (including living and dead plants and animals).</li> </ul>	
<b>palaeontology</b>	The study of fossils.		
<b>erosion</b>	When water, wind or ice wears away land.		
<p>Caves are formed when water <b>permeates</b> through the bedrock and <b>erodes</b> some of the rock away. Over thousands of years these caves can become very large.</p>		<p>Over thousands of years, <b>sediment</b> might enter the mould to make a <b>cast fossil</b>. Bones may change to mineral but will stay the same shape.</p>	
<p>An animal dies. It gets covered with <b>sediments</b> which eventually become rock.</p>		<p>Changes in sea level take place over a long period.</p>	
<p>More layers of rock cover it. Only hard parts of the creature remain, e.g. bones, shells and teeth.</p>		<p>As <b>erosion</b> and weathering take place, eventually the fossil becomes exposed.</p>	