

# VOCABULARY

**Absorb:** soak up or take in.

**Bedrock:** the solid rock in the ground which supports all the soil above it.

**Decaying:** gradually being destroyed by a natural process.

**Erosion:** when water, wind or ice wears away land.

**Fossilisation:** the process by which fossils are made.

**Igneous:** rocks that are formed by volcanic action or intense heat.

**Imprint:** a mark or outline made by the pressure of one object on another.

**Lava:** molten rock that comes out of the ground.

**Magma:** molten rock that is formed in very hot conditions inside the earth.

**Metamorphic:** rocks that have had their original structure changed by pressure and heat.

**Mineral:** something that is formed naturally in rocks and in the earth.

**Molten:** molten rock, metal, or glass has been heated to a very high temperature and has become a hot, thick liquid.

**Palaeontology:** the study of fossils as a guide to the history of life on Earth.

**Permeable:** allows liquids to pass through it.

**Porous:** something that is porous has many holes in it, which water and air can pass through.

**Sediment:** solid material that settles at the bottom of a liquid, especially earth pieces of rock that have been carried along and then left somewhere by water, ice or wind.



# SCIENCE KNOWLEDGE MAT- Year 3

## Rocks

### MAIN IDEA

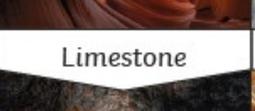
Children should be able to compare and group together different kinds of rocks based on their appearance and physical properties. To recognise that soils are made from rocks and organic matter. Finally, to understand that fossils are formed when living things are trapped within rock.

### WHAT CAME BEFORE

Year 2 – identify and compare every day materials and how things move on different surfaces.

### WHAT COMES NEXT

Year 4 – observe that some materials change state when they are heated.

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

### WHAT YOU SHOULD ALREADY KNOW

- Soil contains nutrients and these help plants to grow.
- Magma is molten rock that is formed in very hot conditions inside the earth.
- Absorb means to soak up or take in.
- Why some materials are used for certain purposes because of their properties.

# KEY LEARNING

- There are three types of rock that are formed naturally: Igneous, Sedimentary and Metamorphic.
- Igneous rocks are formed when molten magma cools. It is a strong, hard-wearing and non-porous rock. Examples: granite and basalt.
- Little pieces of rocks that have been weathered can be found at the bottom of lakes, seas and rivers, this is called sediment. Over millions of years, layers of sediment build up to form sedimentary rocks. Examples: limestone and chalk.
- Metamorphic rocks are formed when some igneous and sedimentary rocks are heated and pressured. Examples: slate and marble.
- Fossils are usually formed when a living thing dies and the body is covered by sediment over tens of thousands of years. Other fossils are made from imprints in surrounding sedimentary rocks.
- Caves are formed when water permeates through the base rock and erodes some of the rock away.
- Soil is made from pieces of rock, minerals, decaying plants and water. There are layers of soil: above the soil is leaf litter and recently decaying plants, as the soil becomes deeper, the rock grains become larger until bedrock is reached.

### INVESTIGATE / QUESTIONS

- Go on a walk in your local area and explore the type of rocks you come across.
- Can you explain why rocks are used for different purposes based on their properties?
- What happens when rocks are rubbed together?
- What happens to rocks when they are in water?

## VOCABULARY

**carpel:** female part of the flower – made of stigma, style and ovary

**flower:** the part of the plant where seeds are made

**germinate:** when a seed starts to grow and produce a root and shoot

**leaves:** catch sunlight and use this to make food

**life cycle:** the stages a living thing goes through during its life

**nutrients:** materials in the soil that help to nourish plants

**ovary:** the part of the flower that contains the ovules

**ovule:** these are like eggs; they develop into seeds

**petal:** part of the flower that attracts insects, often brightly coloured

**photosynthesis:** how green plants make their own food

**pollen:** dust-like powder made in the stamen of a flower

**pollination:** transferring pollen grains from the male anther of a flower to the female stigma so that new plants can be made



## SCIENCE KNOWLEDGE MAT- Year 3

### Year 3 - Plants

#### MAIN IDEA

Understand the function of different parts of a flower and understand its needs to grow. Plants are different from other animals and humans in that they are able to produce their own food from photo-

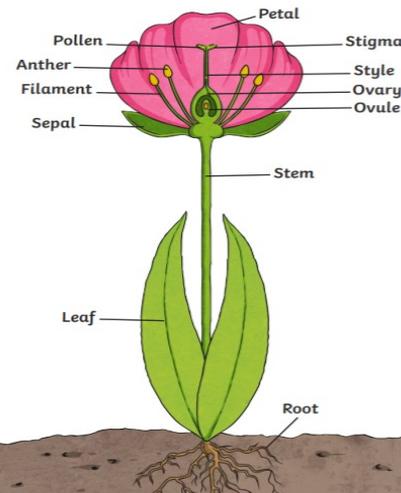
#### WHAT CAME BEFORE

Year 2 -How seeds and bulbs mature into plants. That plants need for water, light and a suitable temperature to grow and stay healthy.

#### WHAT COMES NEXT

Year 5 – reproduction process of plants

#### Parts of a Plant



#### WHAT YOU SHOULD ALREADY KNOW

- Plants can grow.
- Names of common garden plants (e.g. poppy, rose) and the names of some common wild plants (e.g. daisy, dandelion, nettle).
- The parts of a plant include: petals, fruits, roots, bulbs, seeds, stem, trunks and branches.

## KEY LEARNING

To grow a healthy plant you need:

Sunlight, Water, Nutrients

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

# VOCABULARY

**Balanced Diet:** a variety of food that you regularly eat.

**Energy:** the ability and strength to do physical things.

**Endoskeleton:** the internal skeleton of an animal, especially the bony skeleton of vertebrates.

**Exoskeleton:** the protective or supporting structure covering the outside of the body of many animals.

**Hygiene:** keeping yourself and your surroundings clean, especially in order to prevent illness or the spread of diseases.

**Joints:** the junction between two or more bones.

**Muscles:** something inside your body which connects two bones and which you use when you make a movement.

**Nutrients:** substances that help plants and animals to grow.

**Nutrition:** the process of taking food into the body and absorbing the nutrients in those foods.

**Organs:** a part of your body that has a particular purpose.

**Relax:** when a part of your body relaxes, or when you relax it, it becomes less stiff or firm.

**Saturated Fats:** types of fats, considered to be less healthy, that should only be eaten in small amounts.

**Skeleton:** the framework of bones in your body.

**Starchy:** foods that contain a lot of starch (a nutrient which gives you energy).

**Tendons:** a strong cord in a person's or animal's body which joins a muscle to a bone.



# SCIENCE KNOWLEDGE MAT- Year 3

## Animals Including Humans

### MAIN IDEA

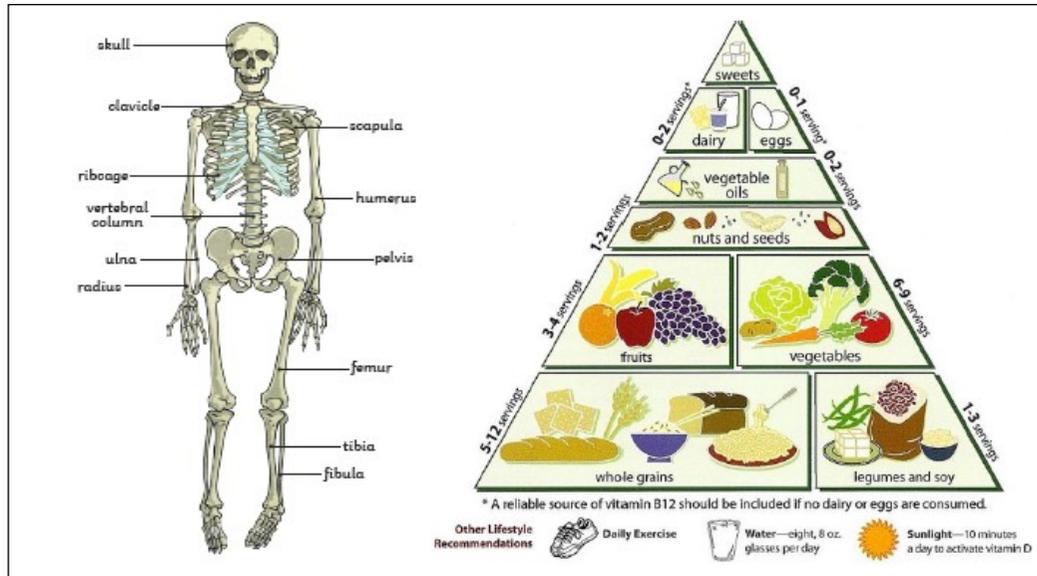
Children will identify that humans and some other animals have skeletons and muscles for support, protection and movement. They will understand that humans need a certain amount of nutrition from what they eat and they cannot make their own food.

### WHAT CAME BEFORE

Year 2: describe the basic needs of animals, including humans, for survival and growth.

### WHAT COMES NEXT

Year 4: describe the functions of the parts of the digestive system and identify different types of teeth.



### WHAT YOU SHOULD ALREADY KNOW

- There are five types of vertebrates: mammals, fish, reptiles, amphibians and birds.
- Vertebrates are animals that have a backbone.
- All animals need water, air and food to survive.

# KEY LEARNING

- Vertebrates are animals that have a backbone. These skeletons are called endoskeletons, this means that the skeletons are on the inside of the bodies. These skeletons grow with the bodies.
- When the skeleton exists outside the body, it is called an exoskeleton. An exoskeleton is a covering that supports and protects animals. These have to be shed and a new skeleton is grown.
- Skeletons provide support and shape to an animal's body, allow movement through the joints and protect vital organs.
- Humans cannot make their own food like plants do, we need to eat plants and animals to get our energy.
- Healthy, balanced diets lead to

### INVESTIGATE / QUESTIONS

- Can you design a menu based on your understanding of a balanced diet?
- What would happen if one part is missing from a balanced diet? How might some groups of people (e.g. vegetarians) compensate for missing areas?
- Can you prepare food hygienically?
- What do you think would happen if humans did not have skeletons?

## VOCABULARY

Light: a type of energy that makes it possible for us to see the world around us

Light source: An object that emits (gives out) light.

Illuminate: A verb meaning to light up. E.g. A flash of light illuminated the house.

Light beam: A projection of light energy radiating from a light source.

Shadow: An area of darkness produced by an object coming between rays of light and a surface.

Opaque : A material you are not able to see through (not transparent).

Translucent : A material allowing light, but not detailed shapes, to pass through (semi-transparent).

Transparent: A material allowing light to pass through so that objects behind can be seen clearly.

Reflection: When light hits the surface of an object and then that light travels to our eyes so we can see.

Mirror: A surface, typically glass coated with metal, which reflects a clear image.

Torch: A portable battery-powered electric lamp.

Darkness: the absence (when there isn't any) light in a place.



## SCIENCE KNOWLEDGE MAT- Year 3

### Y3 Light

#### MAIN IDEA

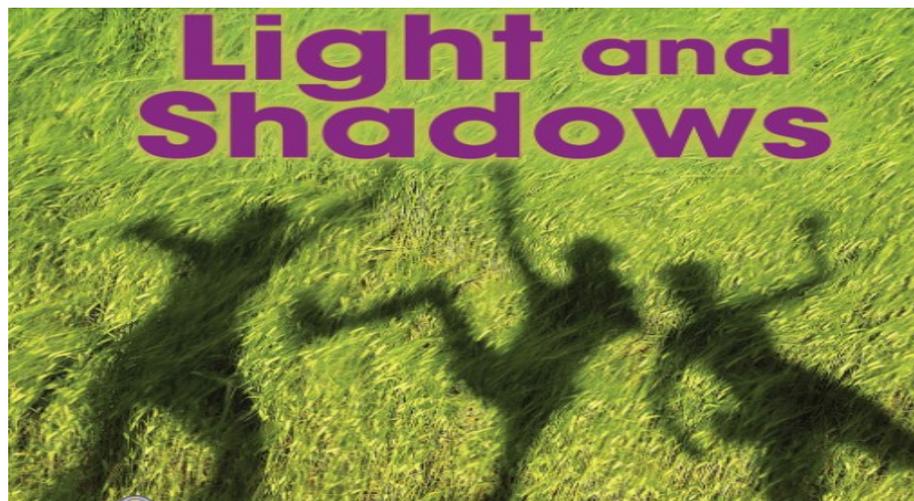
Pupils will explore what happens when light reflects off a mirror or other reflective surfaces. They will learn about why it is important to protect their eyes from bright lights. They will look for, and measure, shadows and find out how they are formed and what might cause the shadows to change .

#### WHAT CAME BEFORE

Describe materials and habitats using adjectives such as light / dark and compare them.

#### WHAT COMES NEXT

Use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.



#### WHAT YOU SHOULD ALREADY KNOW

That there are four seasons in the United Kingdom, and these are linked to different weather changes such as the amount of sunlight and changes in temperature. Children will have begun to think about how these changes might happen, such as the concept that the earth is rotating and this affects the amount of sunlight we may get.

## KEY LEARNING

- 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.

#### INVESTIGATE / QUESTIONS

Let's see if we can find some shiny objects and surfaces. Do they give off their own light?

Do "shiny" things always give their own light? If not, they are reflective! Where is the light source that it is reflecting off?

Let's take a look at shadows we can see out of the window. Do they stay the same throughout the day? If not, how do they change?

Why are shadows black? Why do only the outlines of objects show and not the details?

## VOCABULARY

Force: power, energy, or physical strength.

Push: to use pressure against in order to move.

Pull: to take hold of (something) and use force to bring it nearer to oneself.

Surface: the outside limit or top layer of something. E.g. *Most of the earth's surface is covered by water.*

Magnet: a rock or a piece of metal that can pull certain types of metal toward itself.

Magnetism: the force of magnets.

Magnetic: any material or object that is attracted by magnets.

Attract: to pull to or draw toward a magnet.

Repel: to force away from a magnet. The opposite of attract.

Metal: any solid mineral element that exhibits certain characteristics such as the ability to conduct heat or electricity.



## SCIENCE KNOWLEDGE MAT- Year 3

### Y3 Forces & Magnets

#### MAIN IDEA

Magnets attract or repel each other and attract some materials and not others, depending on how their two poles (North or South) are positioned. Magnetic forces can act without direct contact, unlike most forces, where direct contact is necessary (for example, opening a door, pushing a swing).

#### WHAT CAME BEFORE

Y2 - the shapes of some solid objects can be changed by applying a force such as squashing and bending. That an object can be moved using pushes and pulls.

#### WHAT COMES NEXT

Y5 - the study of gravity and that unsupported objects fall towards the Earth because of the force of it. That air resistance, water resistance and friction, that act between moving surfaces.



#### WHAT YOU SHOULD ALREADY KNOW

Magnets can attract some objects, and each other depending on how they are positioned.

## KEY LEARNING

- 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 only some materials
- 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
- predict whether two magnets will attract or repel each other, depending on which poles are facing.
- explore the behaviour and everyday uses of different magnets (for example, bar, ring, button and horseshoe).
- explore the strengths of different magnets and finding a fair way to compare them

## INVESTIGATE / QUESTIONS

Which materials are attracted and which are not? Find and group them.

Explore patterns in the way that magnets behave in relation to each other and what might affect this.

Identify how magnets can be useful in everyday items. Can you think of creative ways to use magnets in a game, or in our everyday lives?