Year 3/4

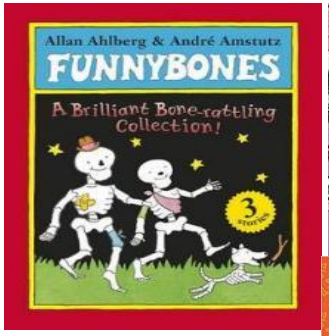
Even Years

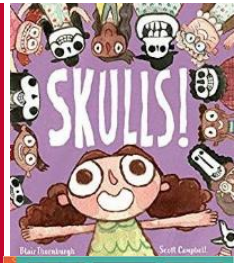
Year 3/4: Animals including Humans (Skeleton and Muscles) Knowledge Mat

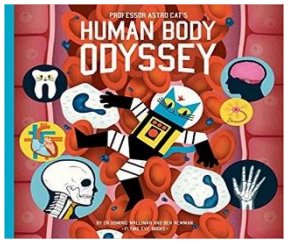
Subject Specific Vocabulary

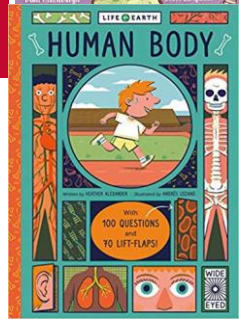
nutrition	Nutrition involves drinking enough water and eating the right amount of items from the four main food groups.
skeleton	The human skeleton is made of bone and grows as we grow. Our skull protects our brain and our ribs protect our heart and lungs.
muscles	Muscles are attached to bones by tendons and help them to move. When a muscle contracts it gets shorter and pulls on the bone it is attached to.
diet	Our bodies need a balanced diet to work properly. This involves drinking enough water and eating healthily.
joint	Joints allow the body to make movements. The body has many bones and are connected through the joints.
pelvis	The pelvis is a bony cradle-shaped structure located at the base of the spine.
cartilage	Cartilage is a connective tissue found in many areas of the body including: Joints between bones e.g. the elbows, knees and ankle.
rib cage	It is made up of curved bones. The rib cage is found in the chest area. It protects a persons internal organs from damage.
tendon	Muscles are attached to the bone by tendons and work in pairs to allow for smooth movement.
spine (backbone)	Also known as your backbone, your spine is a strong, flexible column of ring-like bones that runs from your skull to your pelvis.
tissue	Tissue is the fleshy part of your body made up of similar cells that forms muscles.

Interesting Books









Important facts to know by the end of the skeleton and muscle topic:

- **Know that humans cannot make their own food. They get their nutrition from what they eat**
- **Know that humans have skeletons and muscles for support, protection and movement**
- **Know that the body parts have special functions**
- **Know the names of the body parts associated with skeleton and muscles**
- **Compare the diets of different groups of animals, including humans**
- **Know what a healthy meal looks like**

Sticky Knowledge about our skeleton and muscles

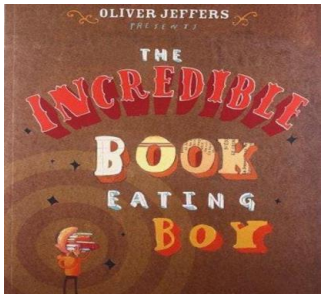
- ❑ The spine is made up of 33 bones and the smallest bone is found in our ear.
- ❑ Muscles make up 40% of our total body weight and the smallest muscle is found in our ears.
- ❑ When we are born we have about 300 bones in our body.
- ❑ By the time we are adults we have 206 because some bones have fused together.
- ❑ When broken our bones will repair themselves. Doctors use casts or splits to make sure they grow back straight.
- ❑ The longest bone in the human body is the thigh bone called the femur.
- ❑ Bone marrow makes up 4% of a human body mass. It produces red blood cells which carry oxygen all over the body.
- ❑ The smallest bone found in the human body is located in the ear called the stirrup bone (2.8mm)
- ❑ The spine is made up of 33 bones.

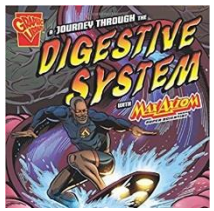
Year 3/4: Animals including Humans (Digestive System) Knowledge Mat

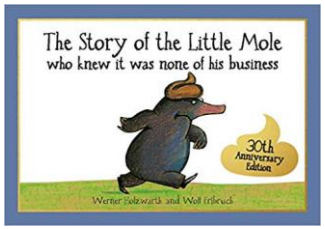
Subject Specific Vocabulary

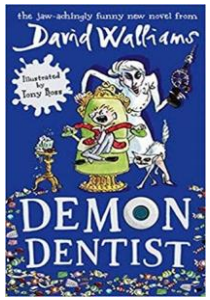
pancreas	The pancreas produces juices called enzymes which helps the body digest food.
oesophagus	The oesophagus is like a stretchy tube that moves food from the back of the throat to the stomach.
intestine	The main function of the small intestine is absorption of nutrients and minerals from food. The major function of the large intestine is to absorb water from the remaining indigestible food.
organ	The skin is the biggest organ of your body. Other organs include your brain, lungs, heart, liver, stomach, intestines, pancreas, and kidneys (called internal organs).
molars	Molars are the teeth that are used for chewing and grinding our food.
canine	Canine are the teeth used for ripping and tearing our food. We have two located at the top of our mouth and two and the bottom.
incisors	The incisor teeth are the narrow-edged teeth at the front of the mouth, adapted for cutting. In humans there are four incisors in each jaw.
food chain	A food chain is a diagram that shows us how animals are linked by what they eat.
predators	Predators are wild animals that hunt, or prey on, other animals. Predator animals need the flesh of the animals that they kill to survive.
prey	The term prey refers to an animal that is sought, captured, and eaten by a predator.
producers	Food chains start with a producer (usually a green plant or algae)
consumers	Consumers get their food by eating plants or other animals

Interesting Book



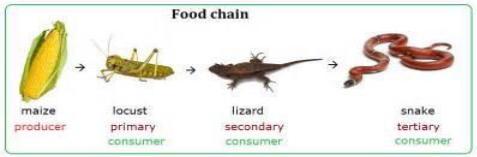






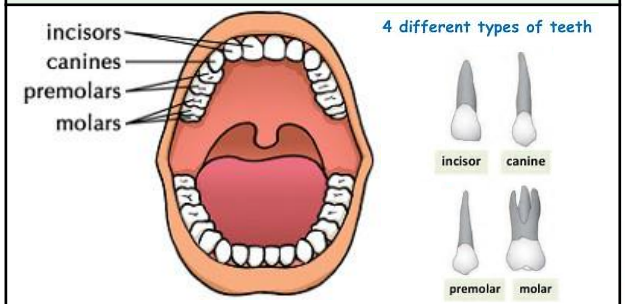
Important facts to know by the end of the digestive system topic:

- **Know and name the parts of the digestive system**
- **Know the function of each organ of the digestive system**
- **Know and identify the different types of teeth in humans**
- **Know the function of different human teeth**
- **Use food chains to identify producers, predators and prey.**
- **Construct food chains to identify producers, predators and prey e.g.**



Sticky Knowledge about the digestive system

- ❑ The oesophagus is the food highway that takes your dinner from your mouth down into your stomach so that digestion can begin.
- ❑ The stomach is filled with powerful acids made by the salivary gland that break down the food into smaller pieces. It also lets us know when we are hungry.
- ❑ The liver creates different enzymes to help process food nutrients that are collected in the small intestine.
- ❑ The main job for the small intestine is to absorb nutrients and minerals from food. In fact, 90% of food absorption takes place here, making it our main digestion location.
- ❑ The outside of our teeth are covered with enamel and the inside have blood vessels and nerves.
- ❑ The front teeth are called incisors, the four sharp teeth are called canines, the teeth at the back are called molars.

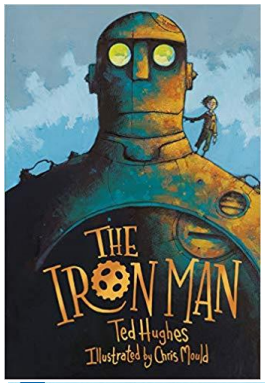


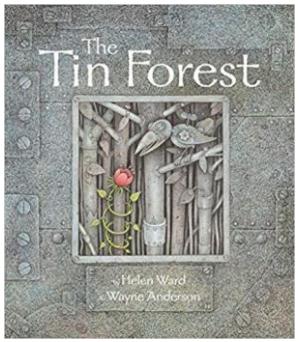
Year 3/4: Forces and Magnets Knowledge Mat

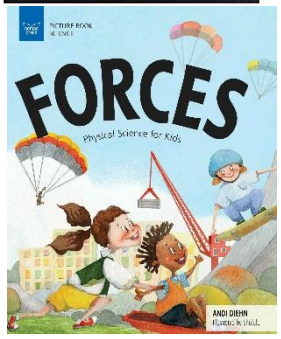
Subject Specific Vocabulary

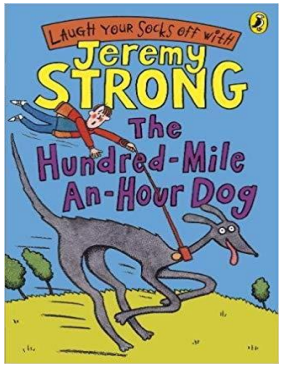
force	A push or a pull. A force makes an object move, change direction or stop.
friction	The force between two objects that are rubbing against each other.
gravity	A force that pulls objects towards the centre of the Earth.
surface	The outside layer of something.
magnet	A long can either be a straight magnet with poles at each end or a horseshoe with poles close to each other.
magnetic pole	Either of two areas on the earth's surface, one near the geographic north pole and one near the geographic south pole, where the Earth's magnetic fields are strongest.
magnetic field	A magnetic field is the area around the magnet where it can attract or repel things. When you bring two magnets together they will either attract or repel.
attract and repel	When you bring two magnets together they will either attract or repel. Attract is when the magnet pulls something towards it. Repel is when it pushes a magnet away.
compass	An instrument that tells you which direction is North and which is South.
direction	The path along which something moves, lies, or points towards or away from.
North	On a compass, it is the direction that's opposite North.
South	On a compass, it is the direction that's opposite South.

Interesting Books









Important facts to know by the end of the rocks and magnets topic:

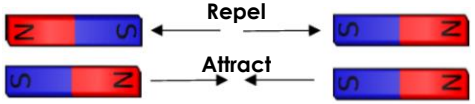
- **Know about and describe how objects move on different surfaces.**
- **Know what friction is and where we see it.**
- **Know that some forces require contact and some do not.**
- **Know that magnets attract some objects but not others.**
- **Predict whether two magnets will attract or repeal each other.**
- **Know that magnets have two poles.**

Sticky Knowledge about forces and magnets

- ❑ Any kind of force is really just a push or pull. Even magnetism is a force,.
- ❑ If the forces are balanced, which means they are equal in size but are acting in opposite directions, the object doesn't move but it might change shape.
- ❑ Magnets only attract certain types of metals, other materials such as glass, plastic and wood aren't attracted.
- ❑ A magnet always has north and south poles. Cutting a magnet in half makes two magnets, each with two poles.
- ❑ The Earth is a very big magnet. Its North and South poles are highly magnetic.

An easy way to remember the compass directions is with the following saying:

Never
Eat
Shredded
Wheat



Year 3/4: Plants Knowledge Mat

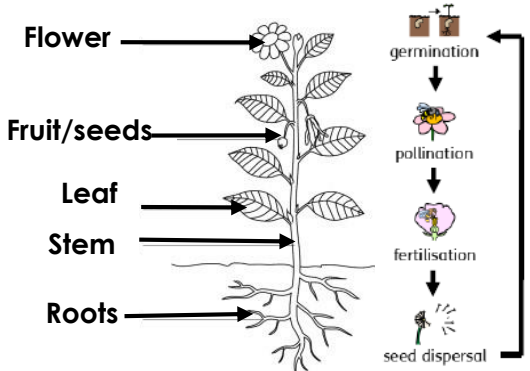
Subject Specific Vocabulary

anther	The part of a stamen that produces and releases the pollen.
branches	The parts that grow out from the tree trunk and have **leaves**, **flowers**, or **fruit** growing on them.
bulb	A root shaped like an onion that grows into a flower or plant.
carbon dioxide	A gas produced by animals and people breathing out.
deciduous	A tree that loses its leaves in the autumn every year.
evergreen	A tree or bush which has green leaves all the year round.
fertilisation	In plants, where pollen meets the ovule to form a seed.
flower	The part of a plant which is often brightly coloured and grows at the end of a stem.
fruit	Something which grows on a tree or bush and contains seeds or a stone covered by an edible substance.
germination	When a seed starts to grow.
leaf/leaves	The parts of a tree or plant that are flat, thin, and usually green.
pollen	A fine powder produced by flowers. It fertilises other flowers of the same species so that they produce seeds.
pollination	To pollinate a plant or tree means to fertilise it with pollen. This is often done by insects like bees.
roots	The part of a plant that grows underground.
stem	The thin, upright part of a plant on which the flowers and leaves grow.
stigma	The top of the centre part of a flower which takes in pollen which is usually sticky.

Interesting Books

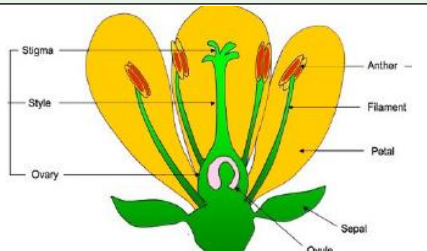
Important facts to know by the end of the plants topic:

- **Know the functions of the different parts of a plant.**
- **Know what different plants need to grow.**
- **Know how water is transported within plants.**
- **Know how flowers help in the lifecycle of a plant.**



Sticky Knowledge about plants

- ❑ **Leaves** use **carbon dioxide** and **sunlight** to make food for the plant.
- ❑ The **petals** on a flower are usually bright - this is to attract bees and other insects so that they can collect **pollen** to make seeds.
- ❑ The **stem** carries water and other **nutrients** from the roots to the rest of the plant. Leaves use this water to make food.
- ❑ The **roots** help to 'anchor' the plant in the soil. They also absorb water and nutrients from the soil for the stem to carry to the rest of the plant.
- ❑ The amount of nutrients a plant needs vary depending on the type of plant. For example, cacti need less water than other plants.
- ❑ **Pollination** occurs when **pollen** from the **anther** is transferred to the **stigma** by bees and other insects.
- ❑ The **pollen** then travels down and meets the **ovule**. When this happens, seeds are formed - this is called **fertilisation**.

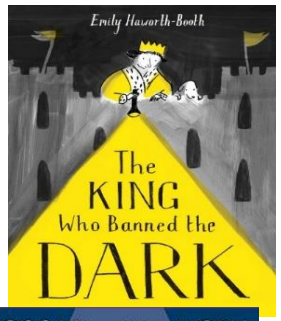


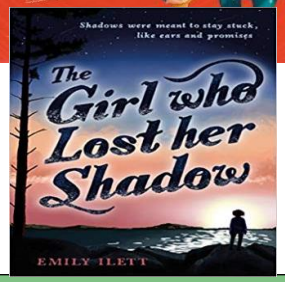
Year 3/4: Light Knowledge Mat

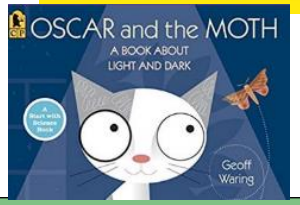
Subject Specific Vocabulary

reflection	It occurs when a ray of light hits a surface and bounces off.
shadows	A shadow is formed when an object blocks out the light. The object must be opaque or translucent to make a shadow.
light source	The main light source for Earth is the Sun. Some other luminous objects give out light, for example, torches, candles and lamps.
opaque	Opaque objects do not allow light to pass through them. In most cases creating a shadow.
refraction	It is the change of direction of a light ray as it passes through different surfaces, for example, from air to water.
periscope	A periscope is an instrument people use to look at things from a hidden position.
nocturnal	If something is nocturnal, it belongs to or is active at night. For example, bats and owls
orbits	An orbit is a repeating path that one celestial body takes around another.
convex	Convex lenses, also called positive lenses, are lenses that curve outward from the edges to the centre.
concave	A concave lens is one where the centre of the lens is thinner than the edges.

Interesting Books



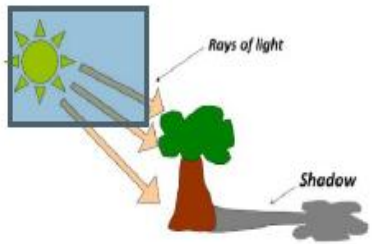


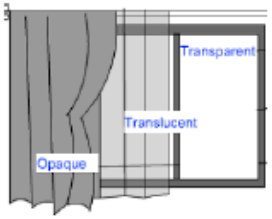


Important facts to know by the end of the light and dark topic:

- **What dark is (in relation to absence of light).**
- **Know that we need light so we can see things.**
- **Know that light can be reflected.**
- **Know how a shadow is formed.**
- **Understand why shadows change shape.**
- **Know the dangers of looking directly at the Sun.**
- **Know how to protect oneself from direct sunlight.**

How shadows are created:





Sticky Knowledge about light and dark

- ❑ Black and dark objects absorb light and heat whilst white or light objects reflects it.
- ❑ Some objects like glass are transparent which means that light can shine through them.
- ❑ Our main source of light on Earth comes from the Sun. A ray of light travels very fast.
- ❑ Darkness is made by blocking light from the sun or some other source of light, which makes shadows
- ❑ The Sun and other stars, fires, torches and lamps all make their own light and so are examples of sources of light.
- ❑ A mirror is not a source of light it merely reflects light. Similarly, the Moon is not a source of light it reflects the light from the Sun.
- ❑ Some animals are nocturnal. They are awake at night and can see very well in the dark. Our eyes aren't designed to see in the night.

Year 3/4

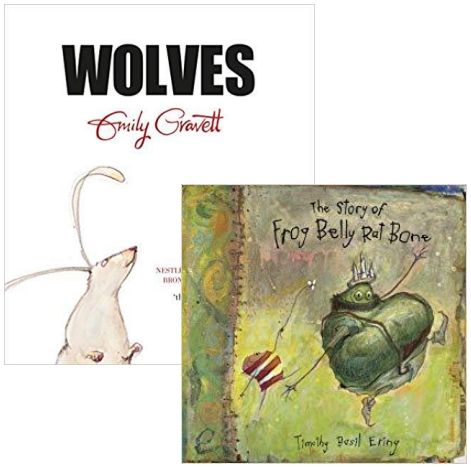
Odd Years

Year 3/4: Living Things and Their Habitats Knowledge Mat

Subject Specific Vocabulary

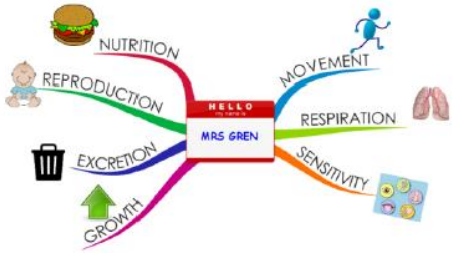
carnivore	An animal that mainly eats a diet of meat.
deciduous	A tree that loses its leaves in the autumn every year.
evergreen	A tree or bush which has green leaves all year round.
excretion	The process of removing waste from the body.
food chain	A series of living things which are linked to each other because each thing feeds on the one next to it in the chain.
habitat	The natural environment in which an animal or plant normally lives or grows.
herbivore	An animal that mainly eats a diet of plants or vegetation.
invertebrate	A creature that does not have a spine or backbone e.g. worm, insect or octopus.
life processes	There are seven processes that tell us that living things are alive.
microhabitat	A small part of the environment that supports a habitat e.g. a fallen log in a forest.
nutrition	The process of taking food into the body and absorbing the nutrients in those foods.
omnivore	A person or animal who eats all kinds of food, including both meat and plants.
reproduction	When an animal or plant produces one or more individuals similar to itself.
respiration	The process of respiring; breathing ; inhaling and exhaling air.
sensitivity	Responding to the external environment.
vegetation	This included plants, trees and flowers.
vertebrate	A creature which has a spine/backbone.

Interesting Books



Important facts to know by the end of the living things and their habitats topic:

- **Understand the seven life processes that all living things do to stay alive.**
- **Know how living things can be grouped.**
- **Use a classification key to help identify living things.**
- **Know how environments change and the effect humans and animals have on these.**



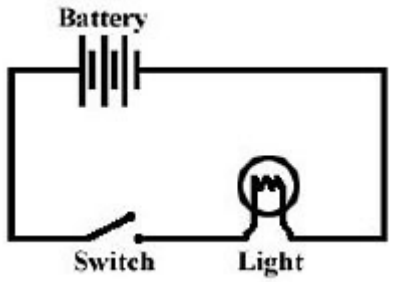
Sticky Knowledge about Living Things and Their Habitats

- ❑ Living things can be grouped according to different criteria (where they live, what type of organism they are, what features they have). For example, a camel can belong in a group of vertebrates, a group of animals that live in the desert, and a group of animals that have four legs.
- ❑ Humans can have positive and negative effects on the environment:
  - **positive effects**: nature reserves, ecological parks
  - **negative effects**: litter, urban development
- ❑ Animals can be grouped into vertebrates (and then further into fish, reptiles, amphibians, birds and mammals) and invertebrates.
- ❑ All living things, which can also be called organisms, have to do certain things to stay alive. These are the life processes:
  - *Movement*
  - *Respiration*
  - *sensitivity*
  - *Growth*
  - *Reproduction*
  - *Excretion*
  - *nutrition*

Year 3/4: Electricity Knowledge Mat

Subject Specific Vocabulary

battery	A small device that provides the power for electrical items such as torches.
bulb	The glass part of an electric lamp, giving out light when electricity passes through it.
buzzer	An electrical device that is used to make a buzzing sound.
cell	Another word for a battery.
circuit	A complete route which an electric current can flow around.
conductor	A substance that heat or electricity can pass through or along.
current	A flow of electricity through a wire or circuit.
electricity	A form of energy that can be carried by wires and in used for heating and lighting, and to provide power for devices.
insulator	A non-conductor of electricity or heat.
mains	Where the supply of water, electricity, or gas enters a building.
motor	A device that uses electricity or fuel to produce movement.
power	Power is energy, especially electricity, that is obtained in large quantities from a fuel source and used to operate lights, heating, and machinery.
source	Where something comes from.
switch	A small control for an electrical device which you use to turn the device on or off.
wires	A long thin piece of metal that is used to fasten things or to carry electric current.



A complete circuit

Important facts to know by the end of the electricity topic:

- **Know where electricity comes from.**
- **Understand how a circuit works.**
- **Know what electrical**
- **conductors and insulators are and examples of these.**
- **Know which appliances run on electricity e.g.**

Sticky Knowledge about Electricity

- ❑ Electricity is generated using energy from natural sources such as the Sun, oil, water and wind.
- ❑ Batteries come in different sizes depending on how much and for how long the appliance is used.
- ❑ A complete circuit is a loop that allows electrical current to flow through wires.
- ❑ A circuit contains a battery (cell), wires and an appliance that requires electricity to work (such as a bulb, motor or buzzer).
- ❑ The electrical current flows through the wires from the battery (cell) to the bulb, motor or buzzer).
- ❑ A switch controls the flow of the electrical current around the circuit. When the switch is off, the current cannot flow. This is not the same as an incomplete circuit.
- ❑ Objects that are made from materials that allow electricity to pass through a create a complete circuit are called electrical conductors.
- ❑ Objects that are made from materials that do not allow electricity to pass through and do not complete a circuit are called electrical insulators.

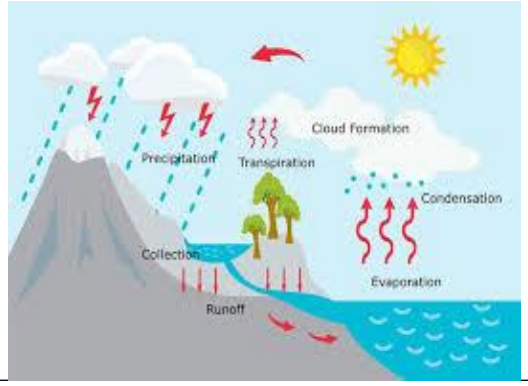
Year 3/4: States of Matter Knowledge Mat

Subject Specific Vocabulary

water vapour	Water that is in the form of gas.
condensation	When water vapour that is around us changes from a gas back to water.
precipitation	Any watery substance such as rain, water, snow, hail or sleet that falls to Earth.
evaporation	When liquid changes into gas, usually when it heats up.
substance	Any solid, liquid, powder or gas is a substance.
matter	Any solid, liquid or gas that exists in the universe.
lava	Very hot liquid that comes out of a volcano.
solid	A substance that stays the same shape. It particles do not move
liquid	Liquids will flow, it is made up of loosely packed particles.
gas	Gaseous matter is made up of matter that is so loose that it is always moving.
substance	Any solid, liquid, powder or gas is a substance.

Stages of the water cycle

1	The sun heats up rivers, lakes and the sea
2	Water evaporates into the air. This is called water vapour.
3	The water vapour rises, cools and turns back to water in the form of clouds.
4	The droplets in the clouds become too heavy and fall as rain, snow or hail.
5	The rain, snow or hail is then collected in rivers that run off to the sea.
6	The cycle starts again.



Sticky Knowledge about water

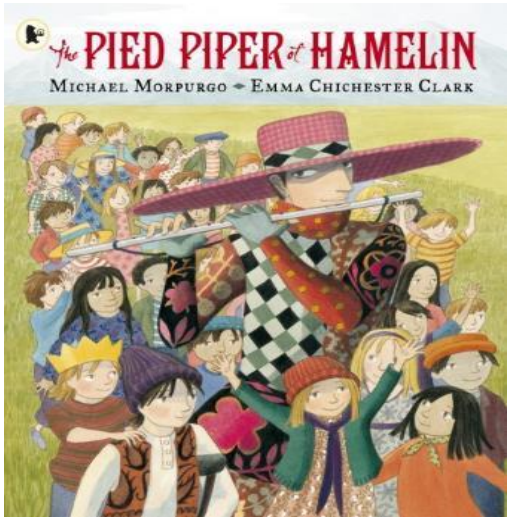
1	Water can exist in three forms: liquid (water), solid (ice) or gas (water vapour).
2	About 70% Earth is covered in water.
3	There are underground reservoirs called aquifers.
4	Some water in the ground may stay there for thousands of years.
5	Water can be used to create electricity through a hydro-electric power station.
6	The Nile is 4132 miles long, making it the longest river in the world.
7	Humans are made up of about 75% water.
8	97% of water is in the oceans (this is salty water) and 2% is in the ice caps, leaving only 1% available for us to drink.

Year 3/4: Sound Knowledge Mat

Subject Specific Vocabulary

vibrating	Sound is caused by the vibration of a medium (usually air) and it travels in waves.
pitch	A high sound has a high pitch and a low sound has a low pitch. A tight drum skin gives a higher pitched sound than a loose drum skin.
volume	Volume is the perception of loudness from the intensity of a sound wave. The higher the intensity of a sound, the louder it is perceived in our ears, and the higher volume it has.
insulation	Protecting something by surrounding it with material that reduces or prevents the transmission of sound.
outer, middle and inner ear	The ear is made up of three different sections: the outer ear, the middle ear, and the inner ear. These parts all work together so you can hear and process sounds.
cochlea	The cochlea looks like a spiral-shaped snail shell deep in your ear. And it plays an important part in helping you hear.
auditory	Auditory is close in meaning to acoustic and acoustical, but auditory usually refers more to hearing than to sound.
frequency	Frequency is measured as the number of wave cycles that occur in one second.
hammer	The ear has little bones called ossicles that help you hear! They are called the hammer (malleus), anvil (incus), and stirrup (stapes). They amplify the sound or make it louder.

Interesting Book



Important facts to know by the end of the sound topic:

- **Know how sound is made.**
- **Know how sound travels from the source to the ears.**
- **Know to associate sound with vibration.**
- **know the correlation between pitch and the object producing a sound.**
- **know the correlation between the volume of a sound and the strength of the vibrations that produced it.**
- **know what happens to a sound as it travels away from its source.**

Sticky Knowledge about Sound

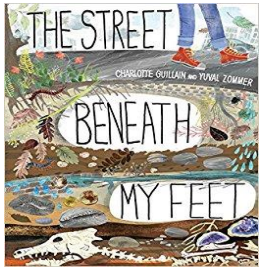
- ❑ Sound travels with a speed of 767 miles per hour but it cannot travel through a vacuum.
- ❑ Sound comes from vibrations. These vibrations create sound waves which move through mediums such as air and water before reaching our ears.
- ❑ Dogs can hear at a higher frequency as compared to humans.
- ❑ Our ears vibrate in a similar way to the original source of the vibration, allowing us to hear many different sounds.
- ❑ When traveling through water, sound moves four times faster than when it travels through air.
- ❑ Sound is used by many animals to detect danger, warning them of possible attacks before they happen.
- ❑ The loud noise you create by cracking a whip occurs because the tip is moving so fast it breaks the speed of sound!

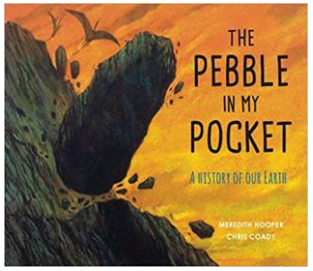
Year 3/4: Rocks and Soils Knowledge Mat

Subject Specific Vocabulary

fossil	A fossil is the preserved remains or traces of a dead organism.
soil	Soil consists of a mix of organic material (decayed plants and animals) and broken bits of rocks and minerals.
crystals	Crystals are a special kind of solid material where the molecules fit together in a repeating pattern.
sedimentary rock	Sedimentary rocks are made when sand, mud and pebbles get laid down in layers. Over time, these layers are squashed under more and more layers.
metamorphic rock	When a rock experiences heat and pressure, it becomes a metamorphic rock. All metamorphic rocks start as another type of rock.
igneous rock	Igneous rock is formed when magma cools and solidifies, it may do this above or below the Earth's surface.
sediment	Natural solid material that is moved and dropped off in a new place by water or wind.
permeable	A permeable surface allows materials like liquids to pass through — either in or out.
impermeable	Something that is impermeable does not allow water or liquid to pass through it.
absorbent	Being absorbent is a material that is able to soak up liquid such as water e.g. a sponge.
magma	Molten rock that remains underground.
lava	Molten rock that comes out of the ground is called lava.

Interesting Book



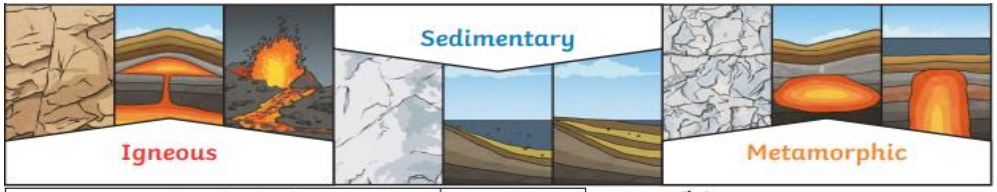


Important facts to know by the end of the rocks and soils topic:

- **Know how fossils are formed.**
- **Know what soil is.**
- **Know the difference between igneous, sedimentary and metamorphic rocks.**
- **Group together different rocks according to different attributes.**

Sticky Knowledge about rocks and soils

- ❑ Rocks have been used by humans for millions of years, from early tools and weapons through to various construction materials.
- ❑ Sediment deposited over time, often as layers at the bottom of lakes and oceans, forms sedimentary rocks.
- ❑ When magma cools and solidifies it forms igneous rock. Examples are granite and pumice.
- ❑ Extreme pressure and heat over time forms metamorphic rocks. Examples are marble and slate.
- ❑ Soil is the uppermost layer of the Earth made up of: minerals, air, water and organic matter e.g. dead plants and animals.



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