

PICKHURST ACADEMY - SCIENCE KNOWLEDGE ORGANISER

Year: 3 Topic: Animals Including Humans (Amazing Bodies) Strand: Biology

What will I know by the end of the unit:

- 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.



- The three most important things a **skeleton** does are:
 - provide **support** and shape to an animal's body
 - allow movement through the **joints**
 - protect organs** (e.g. the skull protects the brain)
- Joints** are where **bones** meet - they allow our bodies to move.
- Muscles contract** and **relax**.
- If you place an **elbow** on a desk and lift your arm up, **muscles** in your upper arm (biceps) **contract** while **muscles** behind the upper arm (triceps) **relax**. The **muscles** work together and in opposition to allow your arm to move.
- Muscles** are connected to **bones** by **tendons**.

What I might know already:

- There are five types of **vertebrates** (mammals, fish, reptiles, amphibians, birds)
- Vertebrates** are animals that have a **backbone**.
- Invertebrates are animals that do not have a backbone.
- All animals need water, air and food to survive.

Key vocabulary

backbone	the column of small linked bones down the middle of your back . Also known as a spine.
bones	the hard parts inside your body which form your skeleton
contract	to make smaller by drawing together; shrink or make tighter.
elbow	the bend or joint between the upper arm and the lower arm
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
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
organs	a part of your body that has a particular purpose
protect	protecting someone or something means to prevent them from being harmed or damaged
relax (muscles)	when a part of your body relaxes, or when you relax it, it becomes less stiff or firm
skeleton	the framework of bones in your body
tendons	a strong cord in a person's or animal's body which joins a muscle to a bone.
vertebrate	a creature which has a spine.

PICKHURST ACADEMY - SCIENCE KNOWLEDGE ORGANISER

Year:	3	Topic:	Forces and Magnets (The Power of Forces)	Strand: Physics
What will I know by the end of the unit:		What I might know already:		
- Forces are pushes and pulls. - These forces change the motion of an object. - They will make it start to move or speed up, slow it down or even make it stop. - For example, when a cyclist pushes down on the pedals of a bike, it begins to move. The harder the cyclist pedals, the faster the bike moves. When the cyclist pulls the brakes, the bike slows down and eventually stops - Forces act in opposite directions to each other. - When an object moves across a surface, friction acts as an opposite force. Friction is a force that holds back the motion of an object. - Some surfaces create more friction than others which means that objects move across them slower.  grass gravel carpet concrete sand wood - On a ramp, the force that causes the object to move downwards is gravity. - Objects move differently depending on the surface of the object itself and the surface of the ramp. Magnets produce an area of force around them called a magnetic field. - When objects enter this magnetic field, they will be attracted to or repelled from the magnet if they are magnetic. - When magnets repel, the push each other away. - When magnets attract, they pull together. - Objects that are magnetic, are attracted to magnets. - Iron and steel are magnetic. - Aluminium and copper are non-magnetic. - The ends of a magnet are called poles. - One end is called the north pole and the other end is called the south pole. Opposite poles attract, similar poles repel. - If you place two magnets so the south pole of one faces the north pole of the other, the magnets will move towards each other. This is called attraction. - If you place the magnets so that two of the same poles face each other, the magnets will move away from each other. They are repelling each other.		- The shape of some materials can be changed when they are stretched, twisted, bent and squashed. - Know how different toys move. - Know what a force is and be able to explain that a push and pull are types of forces. - That when forces are applied to an object they allow them to move or stop moving. The strength of the force determines		
		Key vocabulary		
		attract	if one object attracts another object, it causes the second object to move towards.	
		bendy	an object that bends easily into a curved shape.	
		friction	the resistance of motion when there is contact between two surfaces	
		force	the pulling or pushing effect that something has on something else.	
		gravity	the force which causes things to drop to the ground	
		magnet	a piece of iron or other material which attracts magnetic materials towards it	
		magnetic field	an area around a magnet, or something functioning as a magnet, in which the magnet's power to attract things is felt	
		metal	a hard substance such as iron, steel, gold, or lead	
		motion	the activity of changing position or moving from one place to another	
		non-magnetic	an object that is not magnetic	
		position	the position of someone or something is the place where they are in relation to other things.	
		pull	when you pull something, you hold it firmly and force in order to move it towards you or away from its previous position	
		push	when you push something, you use force to make it move away from you or away from its previous position	
		repel	when a magnetic pole repels another magnetic pole, it gives out a force that pushes the other pole away	
		resistance	a force which slows down a moving object or vehicle	
		squash	pressed or crushed with such force that something loses its shape	
		stretchy	slightly elastic	
		surface	the flat top part of something or the outside of it	
		twist	turn something to make a spiral shape.	

PICKHURST ACADEMY - SCIENCE KNOWLEDGE ORGANISER

Year:	3	Topic:	Plants (How does your garden grow?)	Strand: Biology
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What will I know by the end of the unit:

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 **seeds** are then able to grow to make new **plants**. This is called **germination**. **Leaves** use **carbon dioxide** and sunlight to make food for the **plant**. The **stem** carries water and other **nutrients** from the roots to the rest of the **plant**. Leaves use this water to make food. The **stem** also helps to keep the **plant** upright so that the sunlight can reach it easier. 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.

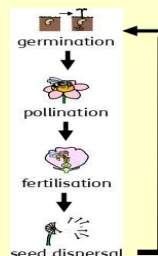
What do different plants need to grow?

Sunlight, water, air, **nutrients** from the soil, room to grow and suitable **temperature**. The amount of each of these may vary depending on the type of **plant**. For example, cacti need less water than other **plants**.

Water is absorbed from the soil by the roots. It is then transported from the roots to the stem and then to the rest of the plant

How do flowers help the lifecycle of flowering plants?

- The flower's job is to create seeds so that new plants can grow.
- 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.
- Seeds are then dispersed so that germination can begin again.



What might I know already:

- Which things are living and which are not.
- A variety of **common wild** and **garden plants**, including **deciduous** and **evergreen trees** and how to identify them.
- The **structure** of **common flowering plants**, including trees (including leaves, flowers, fruits, roots, **bulbs**, **seeds**, **stem**, **trunks** and **branches**)
- **Seeds** and **bulbs** grow into **mature** plants
- **Plants** need water, light and a suitable **temperature** to grow and stay **healthy**.
- Different **vegetation** belts and **climate zones** around the world
- **Plants** and animals depend on each other to survive.

Key vocabulary

absorb	soak up or take in
anther	the part of a stamen that produces and releases the pollen
bulb	a root shaped like an onion.
carbon dioxide	a gas produced by animals and people breathing out
climate zone	sections of the Earth that are divided according to the climate. There are three main climate zones; polar, temperate and tropical.
common	something that is found in large numbers or happens often
deciduous	a tree that loses its leaves in the autumn every year
dispersed	scattered, separated, or spread through a large area
dissect	to carefully cut something up in order to examine it scientifically
evergreen	a tree or bush which has green leaves all year round
fertilization	in plants, where pollen meets the ovule to form a seed
fertiliser	a substance that is added to soil in order to make plants grow more successfully
flowering	trees or plants which produce flowers
function	a useful thing that something does
germination	if a seed germinates or if it is germinated, it starts to grow
healthy	Well and not suffering from illness
lifecycle	The series of life changes that an animal or plant goes through from the beginning of its life until the end,
mature	when something matures, it is fully developed
nutrients	substances that help plants and animals to grow
ovule	a small egg
petal	thin coloured or white parts which form part of the flower
plant	a living thing that grows in the earth and has a stem, leaves and roots
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 is to fertilise it with pollen. This is often done by insects
seed	the small, hard part from which a new plant grows
stigma	the top of the centre part of a flower which takes in pollen
structure	the way in which something is built or made
	a measure of how hot or cold something is

PICKHURST ACADEMY - SCIENCE KNOWLEDGE ORGANISER

Year:	3	Topic:	Rocks and Fossils (Rock detectives)	Strand: Chemistry
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What will I know by the end of the unit:

- There are three types of rocks that are formed naturally.
- Igneous:
 - When molten magma cools, igneous rocks are formed.
 - This either cools and forms rocks under the earth's surface, or flows out of erupting volcanoes as lava and may mix with other minerals.
 - Examples include granite and basalt.
 - This type of rock is strong, hard-wearing and non-porous.
- Sedimentary:
 - Sometimes, 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 this sediment build up forming sedimentary rocks.
 - Examples include limestone and chalk.
 - Sedimentary rocks are porous and can easily be worn down.
- Metamorphic:
 - When some igneous and sedimentary rocks are heated and squeezed (pressured), they form metamorphic rocks.
 - Examples include slate and marble.
 - Metamorphic rocks are strong. Bricks and concrete are not rocks because they are man-made.
- Fossils are the remains of prehistoric life.
- They are usually formed when a living thing (plant or animal) dies and the body is covered up or buried by sediment over tens of thousands of years.
- Some fossils are formed when the tough bones and teeth in animals, and the woody part of plants are preserved.
- Other fossils are made from imprints in surrounding sedimentary rock such as footprints or imprints from shells.
- Fossils tell us about the Earth and about life that existed hundreds of thousands and millions of years ago.
- Soil is made from pieces of rock, minerals, decaying plants and water.
- When rock is broken down into small grains, soil is formed.
- 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.

What I might know already:

- The role of Mary Anning in palaeontology and the discovery of fossils.
- Soil contains nutrients and these help plants to grow.
- The meaning of the word absorb.
- That magma is molten rock that is formed in very hot conditions inside the earth.
- Why some materials are used for certain purposes because of their properties.

Key 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
grain	a grain of something such as sand or salt is a tiny hard piece of it
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
magma	molten rock that is formed in very hot conditions inside the earth.
man-made	things are created by people
metamorphic	rocks changed by heat or pressure
mineral	something 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
natural	things that exist in nature and are not made by people.
nutrients	substances that help plants and animals to grow
paleontology	the study of fossils
permeable	if a substance is permeable, something such as water or gas can pass through it or soak into it.
porous	something that is porous has many small holes in it, which water and air can pass through.
prehistoric	the time in history before any information was written down.
preserve	to protect from decay
pressure	force produced when you press hard on something.
properties	the qualities or features that belong to something and make it recognisable
rock	a solid mass made up of minerals. Rock forms much of the earth's outer layer, including cliffs and mountains
sediment	solid material that settles at the bottom of a liquid, especially earth and pieces of rock that have been carried along and then left somewhere by water, ice, or wind.
soil	the substance on the surface of the earth in which plants grow.
surface	the flat top part of something or the outside of it
surrounding	to be present all around
volcano	a mountain from which hot melted rock, gas, steam, and ash from inside the Earth sometimes burst.

PICKHURST ACADEMY - SCIENCE KNOWLEDGE ORGANISER

Year:	3	Topic:	Light (Can you see me?)	Strand: Physics
What will I know by the end of the unit:			What might I know already:	
A light source is something that emits light by burning, electricity or chemical reactions. Burning light sources include the Sun, flames from a fire and stars. We must never look directly at the Sun as the light produced is very bright and can be harmful to our eyes. This is why we wear sunglasses. Electric lights include lamps, car headlights and street light. Lights that are caused by chemical reactions are much less common. This happens when different chemicals react and light is a product of that reaction. Examples can include glow sticks and fire flies. We need light so that we are able to see in the dark. This is because the dark is the absence of light. The Sun and stars always give us light but we can only see the stars when it is dark. At night time we cannot see the Sun's light as the Earth turns and our part of the Earth is not lit up by the Sun at night. When we are driving, we need car headlights or street lights to help us. If we are walking or out in the dark, we would need torches to help us see. You should not look directly into the torch as this is dangerous. What are NOT sources of light? The Moon is not a source of light even though we can see it in the dark. This is because the Sun's light reflects on the surface of the Moon making it appear as though the Moon emits light. Shiny things are not light sources - they appear to be sources of light as they are bright. How does light travel? Light travels in straight lines. When light is blocked by an opaque object, a dark shadow is formed. When light is blocked by an opaque object, a dark shadow is formed. An opaque material blocks light so we can't see through it and shine a light through it. When light is shone onto a transparent object, the light travels through it, we can see through it and it makes a very faint shadow. When light is shone onto a translucent object, some of the light travels through it, we can see bright light sources through it and it makes a fairly dark shadow. The size of a shadow changes as the light source moves. The further away the light source is, the smaller the shadow is. The closer the source of light, the bigger the shadow.			- Certain things produce light, usually by burning (e.g. the Sun) or electricity (e.g. street lights) - Shiny materials do not make light but do reflect it.	
			Key vocabulary	
			angle	the direction from which you look at something
			bright	a colour that is strong and noticeable, and not dark
			chemical reactions	a process that involves changes in the structure of something
			dark	the absence of light
			dim	light that is not bright
			electricity	a form of energy that can be carried by wires and is used for heating and lighting, and to provide power for machines
			emits	to emit a sound or light means to produce it
			light	a brightness that lets you see things.
			mirror	a flat piece of glass which reflects light, so that when you look at it you can see yourself reflected in it
			opaque	if an object or substance is opaque, you cannot see through it
			product	something that is produced
			reflects	sent back from the surface and not pass through it
			shadows	a dark shape on a surface that is made when something stands between a light and the surface
			source	where something comes from
			sunglasses	glasses with dark lenses which you wear to protect your eyes from bright sunlight
			surface	the flat top part of something or the outside of it
			torches	a small electric light which is powered by batteries and which you can carry
			translucent	if a material is translucent, some light can pass through it
			transparent	If an object or substance is transparent, you can see through it

