Ladywood Primary School Year 6- Science– Animals including Humans

What should I already know?

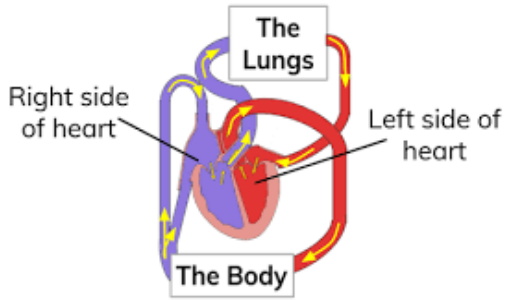
- The importance of exercise, hygiene and a balanced diet.
- Some animals have skeletons for support, protection and movement.
- The basic parts of the digestive system.
- The different types of teeth in humans.

What will I know by the end of the unit?

What is the circulatory system?

The circulatory system is made of the heart, lungs and the blood vessels.

The heart pumps the blood through the blood vessels so that food and oxygen can get to all the parts of the body.



There are three main types of blood vessels:
The arteries, which carry the oxygenated blood away from the heart.
The veins, which carry deoxygenated blood from the capillaries back toward the heart.
The capillaries, which enable the actual exchange of energy between the blood and the tissues.
Blood moves food and oxygen around the body.

Investigate!

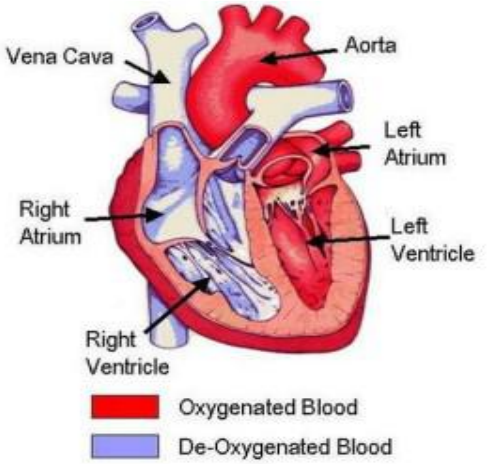
- How does your pulse change with exercise? What is the most efficient way of presenting this data?
- Which exercise produces the fastest pulse? How would you make this a fair test?

Did you know?

If you linked up all of the body's blood vessels, including arteries, capillaries, and veins, they would measure over 60,000 miles.

How does the heart work?

The heart is composed of four chambers; the right atrium, the right ventricle, the left atrium and the left ventricle.
How often your heart pumps is called your pulse.



The heart is composed of four chambers; the right atrium, the right ventricle, the left atrium and the left ventricle.
How often your heart pumps is called your pulse.

The right atrium collects the deoxygenated blood from the body, via the vena cava. It sends the blood to the right ventricle.
2. The right ventricle pumps the deoxygenated blood to the lungs. Here the blood picks up oxygen and disposes of carbon dioxide.
3. The lungs send oxygenated blood back to the left atrium which pumps it to the left ventricle.
4. The left ventricle pumps the blood to the rest of the body, via the aorta.

What can harm the circulatory system?

Some choices, such as smoking and drinking alcohol can be harmful to our health. Tobacco can cause long-term effects such as lung disease, cancer and death. Alcohol can cause long-term effects such as organ damage, cancer and death. You need a healthy diet as obesity can put strain on the heart and cause heart disease. Regular exercise can: strengthen the heart muscle, improves circulation, increases the amount of oxygen around the body, releases brain chemicals which help you feel calm and relaxed.

Key Vocabulary

Pulmonary –related to the lungs
Pulse- the regular beating of blood through your body. How fast or slow your pulse is depends on the activity you are doing.
Blood vessels - the narrow tubes through which your blood flows.
Oxygenated blood - blood that contains oxygen
Deoxygenated blood –blood that does not contain oxygen.
Atrium-one of the chambers in the heart.
Ventricle- one of the chambers in the heart.
Vena cava – the main vein that pumps blood to the heart.
Aorta – the main artery that pumps blood from the heart.
Ventilation- The exchange of air between the lungs and the atmosphere so that oxygen can be exchanged for carbon dioxide.
Liver – am organ that filters you blood.

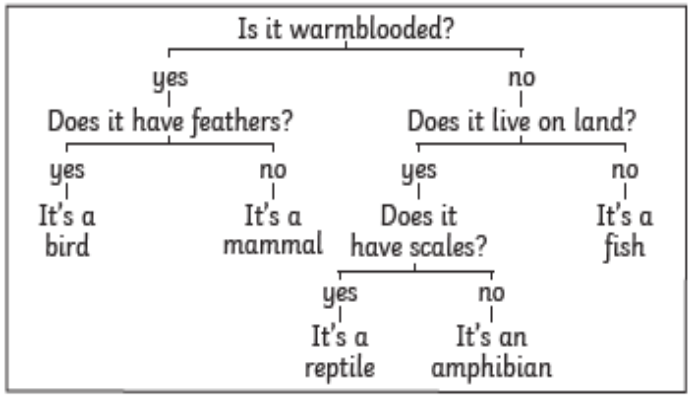
Ladywood Primary School Year 6 Science – All Living Things and their Habitats

What should I already know?

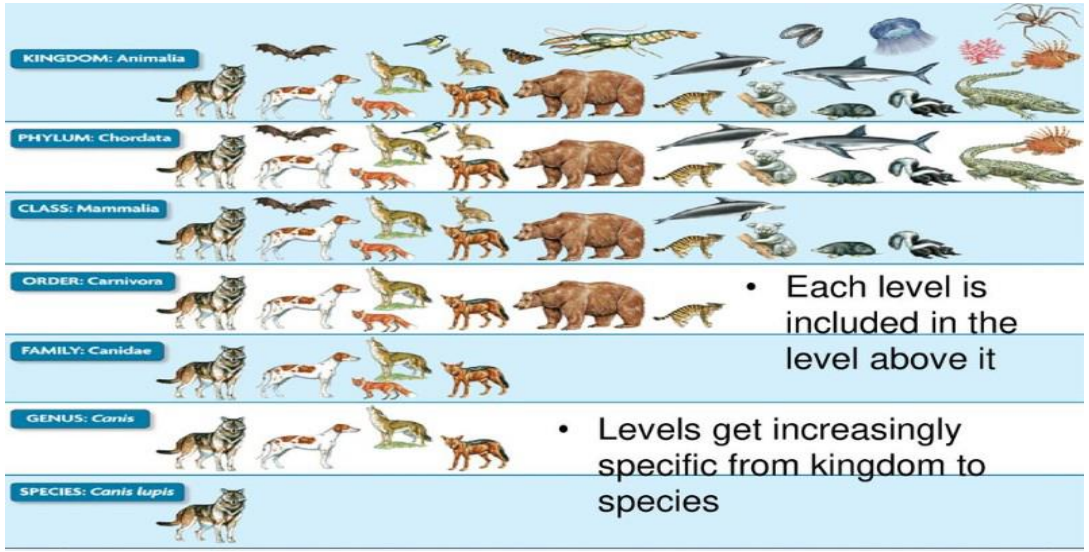
- Organisms can be classified and we can use a classification key to identify them.
- Examples of habitats and the organisms that can be found there.
- Food chains demonstrate the direction in which energy travels.

What will I know by the end of the unit?

Living things can be grouped according to different criteria (where they live, what type of organism they are, what features they have). A classification key is a tool that is used to group living things to help us identify them using recognisable characteristics.



The Linnaean system, named after Carl Linnaeus, has different 8 levels where the number of living things in each group gets smaller and smaller, until there will just be one type of animal in the species group.



Investigate!

- Sort scenarios where microorganisms might be helpful (e.g. yeast in baking) or harmful; (e.g. infectious diseases).
- Use classification systems and keys to identify some organisms in the immediate environment. Record these in a variety of ways (e.g. Venn and Carroll diagrams, tables)
- Research unfamiliar organisms from a broad range of other habitats and decide where they belong in the classification system.
- Research the work of Carl Linnaeus.

What are micro-organisms?

Microorganisms are viruses, bacteria, moulds and yeast. Some animals (dust mites) and plants (phytoplankton) are also microorganisms. Microorganisms are very tiny living things that can only be seen using a microscope. They can be found in and on our bodies, in the air, in water and on objects around us.

Helpful Microbes	Harmful Microbes
Bacteria – cheese	Bacteria – salmonella is a bacterium that can lead to food poisoning
Yeast – wine	Virus – chicken pox and flu are examples of viral diseases
Bacteria – yoghurt	Fungi – athlete's foot
Yeast – bread dough	Bacteria – plaque
Penicillium fungi - antibiotics	Fungi - mould

Key Vocabulary

Characteristics – the qualities or features that belong to them and make them recognisable.
Species -a class of plants or animals whose members have the same main characteristics and are able to breed with each other Distinguishing features.
Microorganisms -very small living thing which you can only see if you use a microscope.
Taxonomy- the part of science focused on classification.
Taxonomist -A scientist who classifies different living things into categories

Ladywood Primary School Year 6 Science – Evolution and Inheritance

What should I already know?

- Features of habitats and the animals and plants that exist there (biodiversity) .
- Sometimes environments can change and this has an effect on the plants and animals that exist there.
- The role of Mary Anning in palaeontology and the discovery of fossils.
- The features of some rocks and the role they play in the formation of fossils.

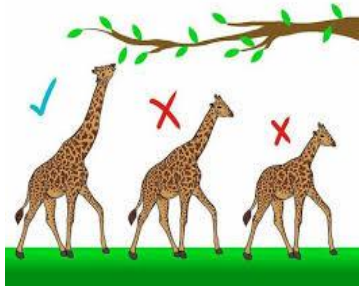
What will I know by the end of the unit?

What is evolution?

Evolution is the way that living things change over time.

We know that living things used to look a lot different to how they do now - we know this because fossils have been found that show creatures that look a lot different to how they do today.

A famous scientist, Charles Darwin observed that although individuals in a species shared similarities, they were not exact copies of each other. He noticed that there were small differences or variations between them.



Survival of the fittest

He also noticed that everything in the natural world was in competition. The winners were those that had characteristics which made them better adapted for survival (for example, they were stronger, faster, cleverer or more attractive than others in their species)

These living things were more likely to reproduce and pass on their useful characteristics to their offspring. Individuals that were poorly adapted were less likely to survive and their characteristics were not as likely to be inherited. Over time, the characteristics that help survival become more common and a species gradually changes. Given enough time, these small changes can add up to the extent that a new species altogether can evolve.

Key Vocabulary

Ancestor- an early type of animal or plant from which a later type has evolved.

Natural selection- a process by which species of animals and plants that are best adapted to their environment survive and reproduce, while those that are less well adapted die out.

Inheritance- you inherit a characteristic you are born with it, because your parents or ancestors also had it.

Variation - change or slight difference

Mutations-characteristics that are not inherited from the parents or ancestors and appear as new characteristics.

Identical – exactly the same.

Evolve- change over time.

Extinct –no longer has any living members,

Native- where it comes from originally.

What is adaption?

Adaptation is when animals and plants have evolved so that they have adapted to survive in their environments. Some environments provide challenges yet some animals and plants have adapted to survive there

Sometimes adaptations can be disadvantageous. One example of this can be the dodo, which became extinct as it lost its ability to fly through evolution. Flying was unnecessary for the dodo as it had lived for so many years without predators, until its native island became inhabited.

Living Things		Habitat		Adaptive Traits
polar bear		arctic		Its white fur enables it to camouflage in the snow.
camel		desert		It has wide feet to make it easier to walk in the sand.
cactus		desert		It stores water in its stem.
toucan		rainforest		Its narrow tongue allows it to eat small fruit and insects.

Investigate!

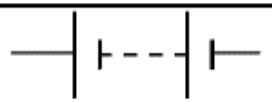
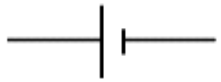
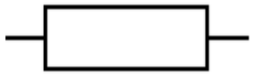
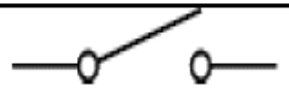
- Research the work of Charles Darwin and Alfred Russel Wallace.
- Create a fact file of an animal or plant identifying how it has adapted to its environment and how it has evolved to survive.
- Create a new planet and describe the environmental features. What animals and plants can live there? How have they adapted to survive?

Ladywood Primary School Year 6 Science – Electricity

What should I already know?

- Where electricity cones from.
- Which appliances need electricity.
- What a circuit is, the components of a circuit and how it works.
- What electrical conductors and insulators are.

What will I know by the end of the unit?

Circuit Symbols	
Symbol	Component
	ammeter
	battery
	bulb
	buzzer
	cell
	motor
	resistor
	switch (open)
	switch (closed)

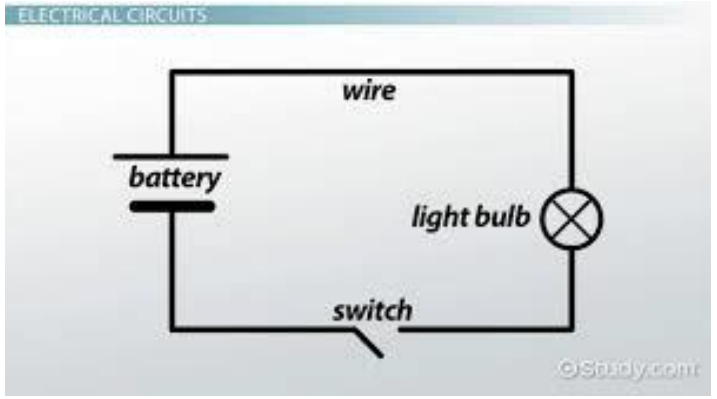
What is a series circuit?

Electricity can flow through the components in a complete electrical circuit. A circuit always needs a power source, such as a battery, with wires connected to both the positive (+) and negative (-) ends. A circuit can also contain other electrical components, such as bulbs, buzzers or motors,. Electricity will only travel around a circuit that is complete. A series circuit only has one pathway around it.

The more cells that are used in a circuit, the brighter the bulb or louder the buzzer. If one cell is used, the higher its voltage, the more powerful the cell is. The shorter the wires, the less resistance there is so the bulb will be brighter.

What is a switch?

You can use a switch in a circuit to create a gap ina circuit (this can be used to switch it on and off) When a switch is open (off), there is a gap in the circuit - electricity cannot travel around the circuit, When a switch is closed (on), it makes the circuit complete - electricity can travel around the circuit.



Key Vocabulary

Symbol - A visual picture that stands for something else.
Component -the parts that something is made of.
Current -flow of electricity through a wire or circuit.
Resistance –The difficulty that the electric current has when flowing around a circuit.
Resistor –a part of an electric circuit that provides resistance to some of the current.
Voltage-. The force that makes the electric current move through the wires. The greater the voltage, the more current will flow.
Voltmeter – measure the voltage in a circuit.
Amps - How electric current is measured.
Ammeter –measures the current in a circuit.
Electrons -Very small particles that travel around an electrical circuit.

Investigate!

- Use circuit symbols when representing a simple circuit in a diagram.
- Design and make a set of traffic lights, a burglar alarm or some other useful circuit.
- Investigate what happens when the voltage of the battery changes.
- Investigate what happens when the length of the wires changes.
- Investigate what happens when you add a resistor to a circuit.
- Use ammeters to measure the current in a circuit.

Ladywood Primary School Year 6 Science – Light

What should I already know?

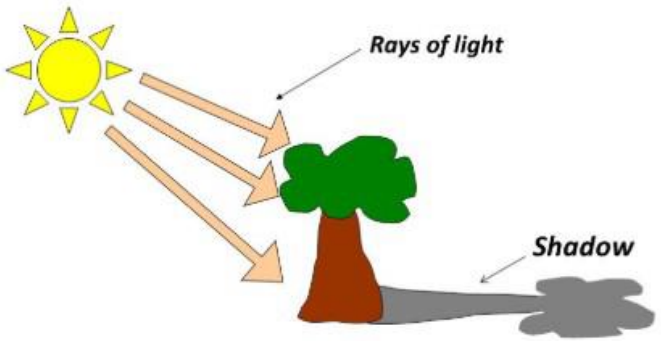
- Certain things produce light, usually by burning (e.g. the Sun) or electricity (e.g. street lights)
- Light travels in straight lines. When light is blocked by an opaque object, a dark shadow is formed.
- The further away the light source is, the smaller the shadow is. The closer the source of the light, the bigger the shadow.

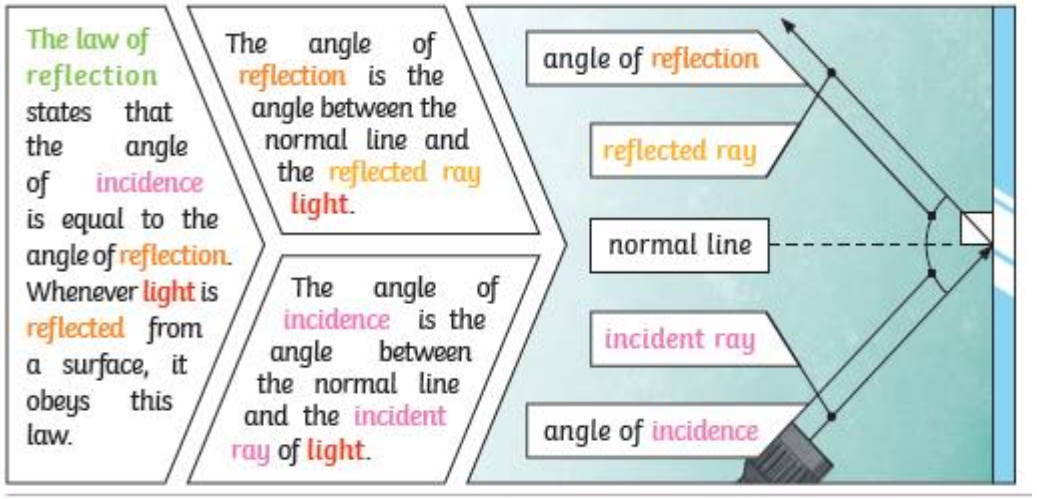
What will I know by the end of the unit?

How does light travel?

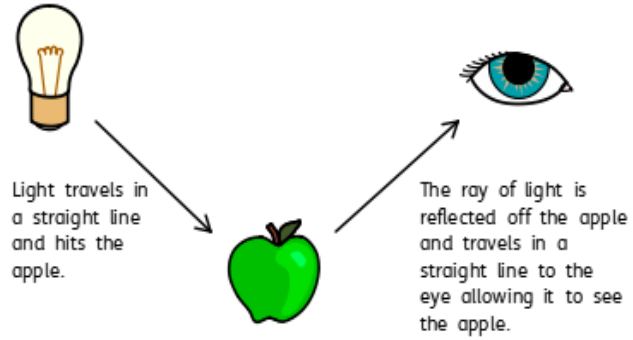
Light travels in a straight line, called beams or rays of light. They travel in waves but do not need a medium to travel through. When you place a torch on a table in a dark room, the beam travels in a straight line.

Reflection is when light bounces off a surface this changes the direction in which the light travels. Because light travels in straight lines, when there is an opaque object blocking the light, a shadow is formed. These shadows have the same shape as the objects that cast them. The size of a shadow changes as the light source moves.





How do we see?



A spoon in the water looks bent. This is because the light bends when it moves from air to water. This is called refraction.

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Key Vocabulary

Emit -to emit a sound or light means to produce it.

Angle -the direction from which you look at something.

Reflects –sent back from the surface and not pass through it.

Refraction –when light bends as it passes from one medium to anther. For example moving from air to water.

Elongate – make longer.

Prism – a prism is a 3D shape with flat sides. A transparent prism separates any visible light out into all the colours of the spectrum.

Spectrum – light that is visible to the human eye is made up of the colour spectrum.

Investigate!

- What happens when light is reflected from different surfaces? What happens when light is reflected from a mirror? What happens when the angle of the mirror or light source changes?
- Draw diagrams to show how we see.
- Design an experiment to measure shadow length by changing a variable. Show your results in a line graph.
- Make a periscope and explain how it works.
- Research how mirrors are used in different contexts (e.g. rear view mirrors, on a dangerous bend) and explain why and how they work.
- Explain why objects look bent in water.
- Explore different contexts in which light travels including rainbows, colours on soap bubbles and coloured filters.