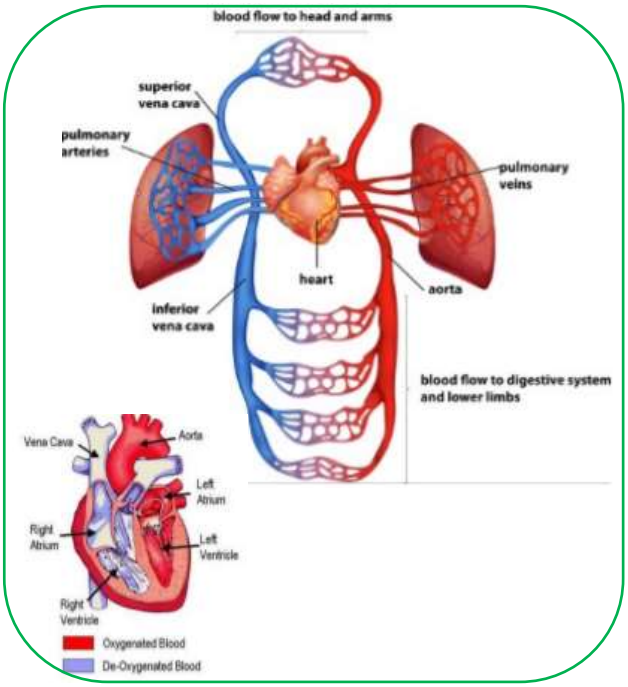
The Circulatory System: Biology

What? (key knowledge)

The Circulatory system	
What is the circulatory system?	The circulatory system is made of the heart, lungs and the blood vessels.
What are arteries?	Arteries carry oxygenated blood away from the heart and to the rest of the body.
What are veins?	Veins visit the heart carrying deoxygenated blood from the rest of the body.
What are capillaries?	Nutrients, oxygen and carbon dioxide are exchanged via the capillaries.

What is the structure of the heart?	The heart is made of four chambers: the left and right atrium and the left and right ventricle.
What is pulse?	How often your heart pumps.
Why is exercise so important?	Exercise has many benefits: increase fitness, reduce fat, strengthen the heart and improve lung function.
What can harm the circulatory system?	Some choices such as smoking and drinking alcohol can be harmful to our health.

aorta	the main artery leaving the heart to deliver blood around the body
atriums	the uppermost chambers of the heart
blood vessels	the tiny tubes through which blood flows around the body
carbon dioxide	a gas produced by humans and animals when breathing
deoxygenated	blood which does not contain oxygen
nutrients	substances that help living things to grow
oxygenated	blood that contains oxygen; oxygen-rich blood
respiration	the process of breathing; inhaling and exhaling air
vena cava	one of the largest veins in the body delivering blood from the body to the heart
ventricles	the two chambers located at the bottom of the heart
cardiovascular	relating to the heart or blood vessels



Influential Scientist:

William Harvey

1578-1657

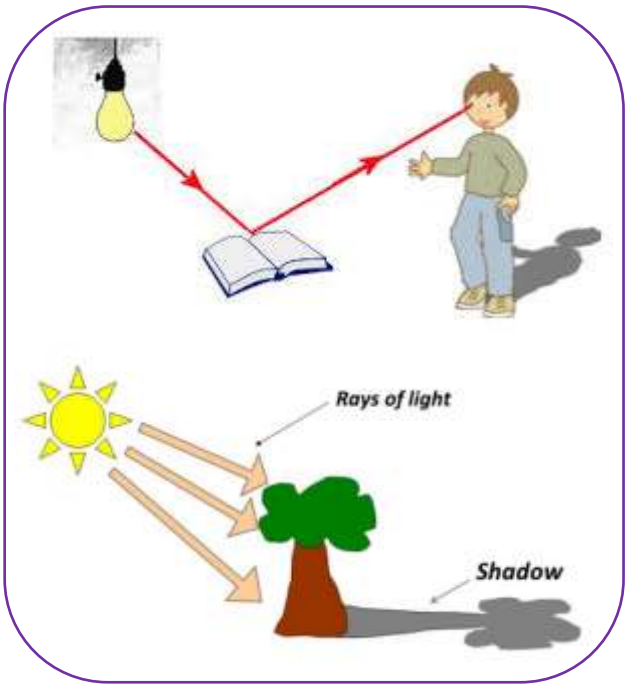
He was the first person to accurately describe the function of the heart and the circulation of blood around the body.

Light: Physics

What? (key knowledge)	
How light travels	
How does light travel?	Light travels in a straight line
What is reflection?	Reflection is when light bounces off a surface - this changes the direction in which the light travels
How do we see objects?	Light travels in a straight line from a light source, before reflecting off an object and into our eyes.

Shadows	
What is a light source?	A light source is something that emits light
How are shadows formed?	Because light travels in straight lines, when there is an opaque object blocking the light, a shadow is formed.
What is the relationship between light sources and shadows?	The size of a shadow changes as the light source moves. It can change in size and position.
Can shadows change shape?	Shadows have the same shape as the objects that cast them

angle	the direction from which you look at something
emits	to emit light means to produce it
mirror	a flat piece of glass which reflects light
opaque	if an object is opaque, you cannot see through it
reflects	to be sent back from a surface and not pass through it
shadows	an area of darkness on a surface made when something stands between the light and the surface
source	where something comes from
surface	the flat top part of something or the outside of it
translucent	if a material is translucent, some light can pass through it
transparent	if an object is transparent, all light can pass through it; you can see through it



Influential Scientist:

Christian Huygens

1629-1695

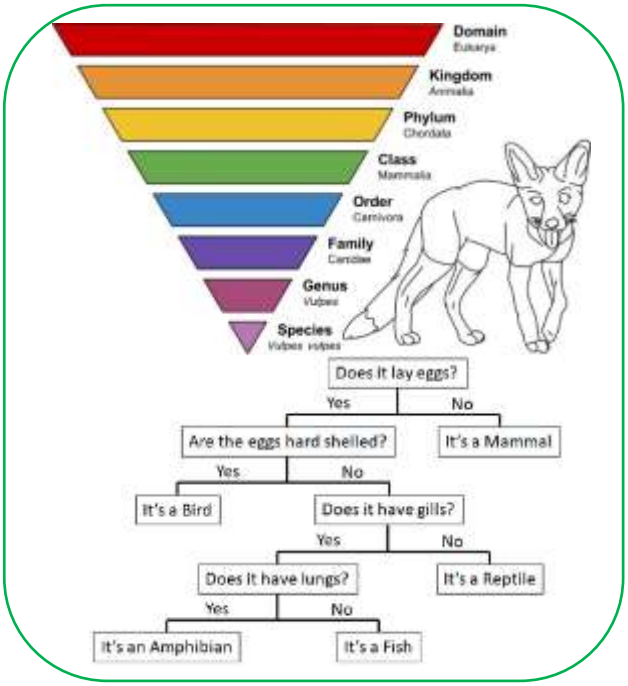
Made ground-breaking contributions in optics and mechanics – mainly known for wave theory of light.

Living things and their habitats: Biology

What? (key knowledge)	
Classifying Organisms	
What is classification?	Classification is grouping something using its features.
What is an organism?	An organism is any living thing.
How can animals be grouped?	Animals can be put into one of two groups: vertebrates or invertebrates.
What are vertebrates?	Vertebrates are animals with a backbone.
What are the different groups of vertebrates called?	Mammals, amphibians, reptiles, birds and fish

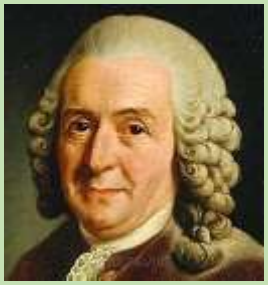
Invertebrates and microorganisms	
What are invertebrates?	Invertebrates are animals which do not have a backbone.
What are the different groups of invertebrates called?	Insects, arachnids and molluscs.
What is a microorganism?	A living thing so tiny that it can only be seen under a microscope.
How can microorganisms be grouped?	Groups of microorganisms include algae, fungi, protozoa, bacteria and viruses.

micro-organism	Micro-organisms are tiny. They are so small they can only be seen with a microscope.
vertebrates	A vertebrate animal is one that has a backbone.
invertebrates	An invertebrate animal does not have a backbone and 97% of creatures belong to this group.
species	This is the grouping together of similar types of plants, animals and other organisms that can reproduce with each other.
fungi	Fungi are a classification or group of living organisms. This means they are not animals, plants, or bacteria.
monera	The whole organism is made up of just one cell. This cell is more basic than cells of other organisms.
bacteria	Bacteria are tiny little organisms that are everywhere around us.
protista	Protists are so small that people can see them only through a microscope.
kingdom	One of the largest groups into which living things are organised.



Influential Scientist:

Carl Linnaeus



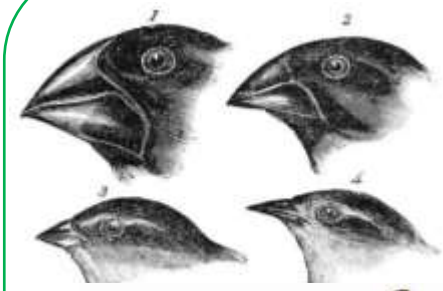
Famous for his work in Taxonomy, the science of identifying, naming and classifying organisms (plants, animals, bacteria, fungi etc.).

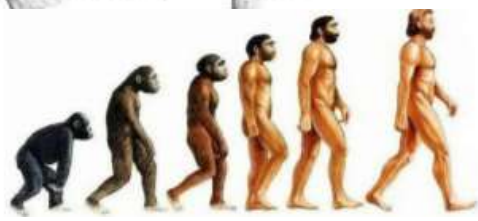
Evolution and Inheritance: Biology

What? (key knowledge)	
Evolution	
What is evolution?	A process where an animal's characteristics change over many generations.
What causes differences within species?	They are caused by inheritance and mutation.
What is inheritance?	When characteristics are passed on from generation to the next.
How do we know about evolution?	Evidence of evolution comes from fossils.
What are fossils?	The hard remains of a prehistoric animal or plant that are found inside a rock.

Adaptation	
What is adaptation?	When animals and plants have evolved so that they have adapted to survive in their environments.
Are all adaptations good?	Adaptations can be disadvantageous. The dodo, became extinct as it lost its ability to fly through evolution.
What is natural selection?	Natural selection is a process by which a species changes over time in response to changes in the environment.
Why do some animals have to adapt?	Some environments provide challenges yet some animals and plants have adapted to survive there.

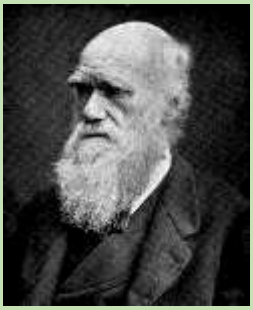
adaptation	a change in structure that improves chance of survival
ancestor	an early type of animal or plant
characteristics	the qualities or features that belong to them and make them recognisable
evolution	a process of change that takes place over many generations
extinct	no longer has any living members
fossil	the hard remains of a prehistoric animal or plant; found in a rock
inherit	born with characteristics from your parents
mutation	characteristics that are not inherited; new characteristics
natural selection	species of animals are best adapted to their environment; survival of the fittest
palaeontology	the study of fossils
variation	a change or slight difference





Influential Scientist:

Charles Darwin



Darwin was an English scientist who studied nature. He is known for his theory of evolution by natural selection.

Electricity: Physics

What? (key knowledge)

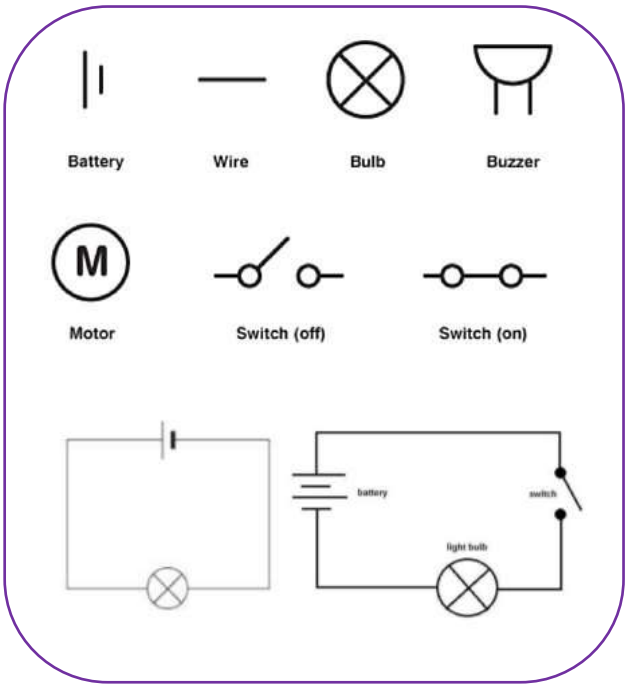
Electricity

What is a series circuit?	A circuit that has only one route for the current to take.
How does a switch affect a circuit?	A component within an electrical Circuit which enables the flow of electricity to be turned on and off
How are electrical components represented?	Electrical circuits can be represented by circuit diagrams. The various electrical components are shown by using standard symbols.

Circuits

What is voltage?	The force that makes electric current move through wires.
What will make a bulb brighter and dimmer within a circuit?	More batteries or a higher voltage create a brighter bulb. Fewer batteries, adding additional components (i.e. extra bulbs) and lengthening the wires make a bulb dimmer.
What will make a buzzer louder and quieter within a circuit?	More batteries or a higher voltage will make a buzzer louder. Fewer batteries, adding additional components (i.e. extra bulbs) and lengthening the wires make it quieter.

battery	A device that stores chemical energy until it is needed; a collection of cells.
cell	A cell is a single unit that stores chemical energy.
buzzer	An electrical device that is used to make a buzzing sound.
circuit	A complete route which an electric current can flow around.
component	The parts that something is made of.
conductor	A substance that heat or electricity can pass through or along.
generate	Cause something to begin or develop.
insulator	Something which does not conduct electricity.
mains	Where the supply of electricity, water or gas enters a building.
power	Power is energy.
resistance	A force which slows down a moving object or vehicle.
resistor	A part of an electric circuit that provides resistance to some of the current.



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