Year 6 Knowledge Objectives and Knowledge Goals – SCIENCE

	The Human Body	Classification of Living Things	Electricity	Light	Reproduction	Evolution
Week 1	***To understand that the heart pumps blood around the body*** Our heart pumps blood around our body The left atrium and left ventricle carry oxygenated blood which is pumped around the body The right atrium and right ventricle carry deoxygenated blood which is pumped out to the lungs	***To know there are five kingdoms of organisms*** Living things or organisms are classified into five main kingdoms The members of each kingdom share features that are unique to that group The five kingdoms are: plants, animals, fungus, protist and monera	***Electricity flows in a circuit*** Electricity can flow from one place to another, this is called electrical current We can control electricity by causing it to flow in a circuit Circuits can contain components that turn electrical energy into different energy forms, for example a light bulb.	***To know that light is a source of illumination that allows us to see*** Light illuminates allowing us to see Some light sources are natural and some are artificial Light travels in straight lines	***To know that asexual reproduction does not require male and female cells*** Asexual reproduction does not require male and female and doesn't alter genetic information Asexual reproduction is when an organism simply copies itself Some plants and some simple animals reproduce asexually	***To know fossils are physical evidence of life from long ago*** Fossils are the remains of organisms A small percentage of life on earth is preserved as a fossil, most organisms decompose Fossils provide evidence for evolution
Week 2	***To understand that blood vessels transport blood around the body*** All the cells in our body need oxygen. It is delivered to them by the blood Arteries carry blood that has been oxygenated in the lungs away from the heart to the cells Veins carry deoxygenated blood from the cells back to the heart to be pumped to the lungs for more oxygen	***To know that plant an animal cells are different*** Cells are the tiny building blocks that make up all living things There are two main types of cells: animal and plant cells Animal and plant cells are structured differently	***The brightness of a lamp or the volume of a buzzer depends on the number and voltage of cells used in a circuit*** Voltage is the pressure from a battery that pushes electricity around a circuit Buzzers and lamps need electricity to make them work The voltage of a battery, or the number of batteries can change the brightness/ volume of lamps and buzzers	***To know that light enters our eyes, allowing us to see*** The cornea is a transparent covering on the outside of your eye The iris is the coloured part of the eye which helps the pupil to 'open and close' Inside the retina, the light rays become electrical signals which travel along the optic nerve to the brain	***To understand sexual reproduction in flowering plants*** Most flowering plants reproduce by combining a male and female gamete (pollen and ovule) to make a fertilised egg that grows into an embryo The embryo or baby plant is protected inside a seed Most flowering plants clothe their seeds with fruit	***To know offspring are usually similar to, but not identical to their parents*** Inheritance is passing on characteristics from a parent to their offspring There are various combinations of characteristics, resulting in variation Evolution is the change in inherited traits

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Week 3	***To understand how the heart rate can speed up or slow down, depending on what the body is doing*** Your heart rate indicates how often your heart squeezes to pump blood through your body When you exercise your cells use more oxygen than usual. That is why exercise makes you breathe harder and makes your heart pump faster Drugs and poor health can affect how well our heart works	***To know that taxonomy is used to show how organisms are related to each other*** Taxonomy is a way of grouping organisms All organisms are placed in one group and then are divided into smaller and smaller groups Organisms are divided into kingdoms, phylum, class, order, family, genus, species All organisms have a scientific name made of the genus and species	***Switches control the flow of electricity in a circuit*** A switch creates a gap in a circuit Making a gap in a circuit prevents electricity from flowing Electricity costs money, so switching off a circuit saves money	***To test the hypothesis that shadows are always the same shape as the object that made them*** Light travels in straight lines Shadows are always the same shape as the object that made them The size of shadows can change, but the outline shape is always the same as the original object	***To know that many plants clothe their seeds with fruit*** Fruits are seed coverings Fruit protects and keep seeds moist Fruits help with seed dispersal	***To know living things can adapt to suit their environment*** Animals and plants that adapt well to an environment have more chance of surviving Adaptation plays an important part in evolution as species change over time
Week 4	WEEKS 4 and 5 ***There are many things that can be varied and changed in an experiment, we call the things we can change variables*** Independent variables can be controlled or manipulated Dependent variables will affect the independent variable Control variables must be held constant.	***To know that vertebrates are classified into five groups: fish, amphibians, reptiles, birds and mammals*** There are five groups of vertebrates Fish are cold-blooded, have gills, live in water and lay eggs Amphibians are coldblooded, have gills and lungs, live in water and on land and lay eggs Reptiles are cold-blooded, have scales and lay eggs Birds are warm-blooded, have feathers, wings and lay eggs Mammals are warmblooded, have hair and feed their young milk	WEEKS 4 and 5 ***To know that circuits can be used to make electrical toys*** When we design something, we think about what we will need and how it will work When we are making something, we may face problems that need to be solved To know which components to use for a particular purpose, and how to connect them	***To understand what light is made of and how a prism works*** Scientists call the light that comes from the sun 'white light' The light from the sun is made up of all the colours of the rainbow When light travels through a prism, the glass slows it down, and changes its course Different colours are slowed down different amounts	***To understand sexual reproduction in animals*** Animals can have male cells; sperm produced in testes, or female cells; eggs produced by ovaries When an egg is fertilised by sperm it is called a zygote The zygote develops into an embryo and then a foetus When a foetus can live outside the mother, it is born	***To know who Charles Darwin was and what natural selection is*** Charles Darwin spent years observing, comparing and analysing many specimens of plants and animals Animals and plants that adapt well to an environment have more chance of surviving, this is called natural selection

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Week 5	OPTIONAL EXTRA LESSON ***To understand that blood is made up of different components*** Red blood cells contain haemoglobin which carries oxygen White blood cells attack and destroy bacteria The liquid part of blood is called plasma Platelets help your body to form clots to stop bleeding	***To understand that scientists divide invertebrates into groups including insects, arachnids and molluscs*** Invertebrates have no backbone Some groups of invertebrates include molluscs, insects and arachnids Cnidarians include coral, jellyfish and anemones		***A periscope uses mirrors to reflect an image of something out of sight*** A periscope helps you to see something that is out of sight A periscope reflects an image using light and mirrors Submarines use periscopes to see above the surface of the water whilst still submerged	***To know that different animals have different growth stages*** Gestation is the period of time that a living thing develops before it is born Different animals have different gestation periods Different species of animal have different ways of looking after their young	***To know who Alfred Wallace was and understand his contribution to the theory of evolution*** Alfred Wallace explored the Amazon, collecting species of beetles, butterflies and birds He explored Malay Archipelago and noticed how certain areas had certain animals He created an imaginary line, known as the Wallace Line
ASSESSMENT	***To understand that the blood circulates throughout the body, gaining oxygen in the lungs and that it is the heart that pumps the blood around*** Scientific knowledge and understanding: • The heart and blood vessels make up the circulatory system • The heart has four chambers. It pumps blood depleted of oxygen to the lungs, and pumps oxygenated blood around the body • Lifestyle choices can impact on our circulatory system including the health of our heart	***To be able to classify animals based on specific characteristics and give reasons*** Scientific knowledge and understanding: • planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs • reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations	***Independently design and make a circuit for a purpose*** Scientific knowledge: • Electricity can flow from one place to another, this is called electrical current • We can control electricity by causing it to flow in a circuit • Making a gap in a circuit prevents electricity from flowing	***To understand how light behaves*** Scientific Understanding: • Light travels in straight lines • Shadows are always the same shape as the objects that made them • The size of shadows can change, but the outline shape is always the same as the original object • Light can reflect from a surface and change the duration of travel	***To know how plants and animals reproduce*** • Asexual reproduction does not require male and female gametes • The organism simply copies itself through cell division or by producing spores or budding • Sexual reproduction requires male and female cells to combine to form a fertilised egg • Most large plants reproduce by combining a male and female gamete (pollen and ovule) to make a fertilised egg that grows into an embryo which is protected inside a seed • Most animals have male cells (sperm produced in testes) or female cells (eggs produced by ovaries) • When a foetus can live outside the mother, it is born	***To show my understanding of evolution*** • Fossils are physical evidence of life from long ago • Offspring are usually similar to, but not identical to their parent • Living things can adapt to suit their environment • Know who Charles Darwin was and what natural selection is • Know who Alfred Wallace was and understand his contribution to the theory of evolution