

Year 6

Science Curriculum

Whole-school definition of science

Science is a way to understand our world by carefully thinking about it and testing our guesses with observations and experiments.

Year 6 Working Scientifically

(Continuing from year 5)

Revision

prediction, measurement, enquiry, dependent variable, independent variable, fair test, similar, theory, hypothesis

Know that we can ask questions and answer them by setting up scientific enquiries

Know how to make relevant predictions that will be tested in a scientific enquiry

Know that in a fair test one thing is altered (independent variable) and one thing that may change as a result is measured (dependent variable) while all other conditions are kept the same

Know how to use a range of equipment to measure accurately, including thermometers, data loggers, rulers and stopwatches

Know how to draw bar charts; how to label a diagram using lines to connect information to the diagram; how to use a coloured key how to draw a neat table; how to draw a classification key; how to show the relationship between an independent variable in a two-way table; and how to label specific results in a two-way table

Know – with structured guidance - how to write a simple scientific enquiry write-up including an introduction, a list of equipment, a numbered method, a detailing of results and a conclusion

Know how to precis a scientific enquiry write-up into a brief oral discussion of what was found in a scientific enquiry

Know that scientific enquiries can suggest relationships, but that they do not prove whether a prediction is true

Know that scientific enquiries are limited by the accuracy of the measurements (and measuring equipment) and by the extent to which conditions can vary even, and that repeating enquiries, measurements and taking measures to keep conditions as consistent as possible can improve an enquiry

Know that the conclusions of scientific enquiries can lead to further questions, where results can be clarified or extended to different contexts (e.g. effect of changing sunlight on a plant – does this work with other plants / different types of light / etc)

Know that they can draw conclusions from the findings of other scientists

Know that a theory is an explanation of observations that has been tested to some extent and that a hypothesis is an explanation that has not yet been tested, but that can be tested through a scientific enquiry

New learning and vocabulary

line graph, relationship, outlier

Know how to choose appropriate variables to test a hypothesis (e.g. plant height as a dependent variable when measuring effect of light on plant growth)

Know how to identify conditions that were imperfectly controlled and can explain how these might affect results

Know how to accurately use further measuring devices, including digital and analogue scales, measuring cylinders and beakers, recognizing the relative accuracy of each device

Know how and when to repeat measurements, how to find an average of a set of measurements and how to recognize and remove outliers from a set of data, justifying the removal as a potential mis-measurement

Know how to independently write a simple scientific enquiry write-up including an introduction, a list of equipment, a numbered method, a detailing of results and a conclusion

Know how to present brief oral findings from an enquiry, speaking clearly and with confidence and using notes where necessary

Know examples of instances where scientific evidence has been used to support or refute ideas or arguments (e.g. fossil records as evidence of natural selection)

Year 6 Working Scientifically

- Sc5/1.1 planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary
- Sc5/1.2 taking measurements, using a range of scientific equipment, with increasing accuracy and precision
- Sc5/1.3 recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, and bar and line graphs
- Sc5/1.4 using test results to make predictions to set up further comparative and fair tests
- Sc5/1.5 reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of results, in oral and written forms such as displays and other presentations
- Sc5/1.6 identifying scientific evidence that has been used to support or refute ideas or arguments.

Year 6 Overview

Block 1

Physics: Light

Block 2

Biology: Evolution and Adaptation

Block 3

Physics: Electricity

Block 4

Biology: Living Things and Their Habitats

Block 5

Biology: Animals Including Humans

Block 6

Biology: Animals Including Humans

THE BIG IDEAS OF SCIENCE

Physics

P1: The universe follows unbreakable rules that are all about forces, matter and energy.

P2: Forces are different kinds of pushes and pulls that act on all the matter that is in the universe. Matter is all the stuff, or mass, in the universe.

P3: Energy, which cannot be created or destroyed, comes in many different forms and tends to move away from objects that have lots of it.

Chemistry

C1: All matter (stuff) in the universe is made up of tiny building blocks.

C2: The arrangement, movement and type of the building blocks of matter and the forces that hold them together or push them apart explain all the properties of matter (e.g. hot/cold, soft/hard, light/heavy, etc).

C3: Matter can change if the arrangement of these building blocks changes.

Biology

B1: Living things are special collections of matter that make copies of themselves, use energy and grow.

B2: Living things on Earth come in a huge variety of different forms that are all related because they all came from the same starting point 4.5 billion years ago.

B3: The different kinds of life, animals, plants and microorganisms, have evolved over millions of generations into different forms in order to survive in the environments in which they live.

Earth science

E1: The Earth is one of eight planets that orbit the sun.

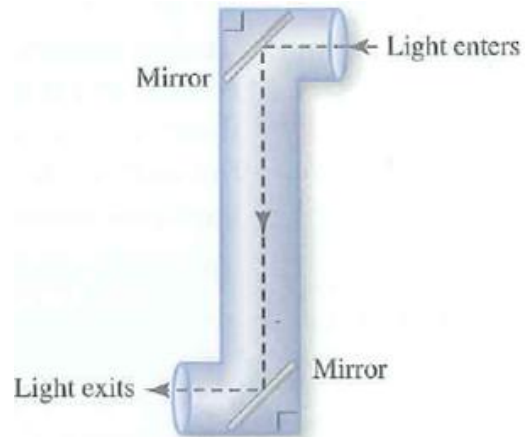
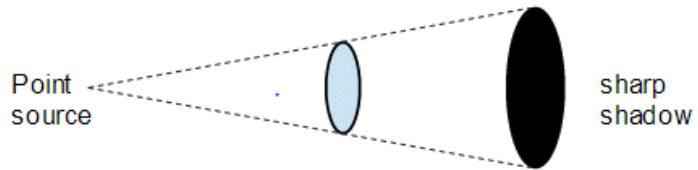
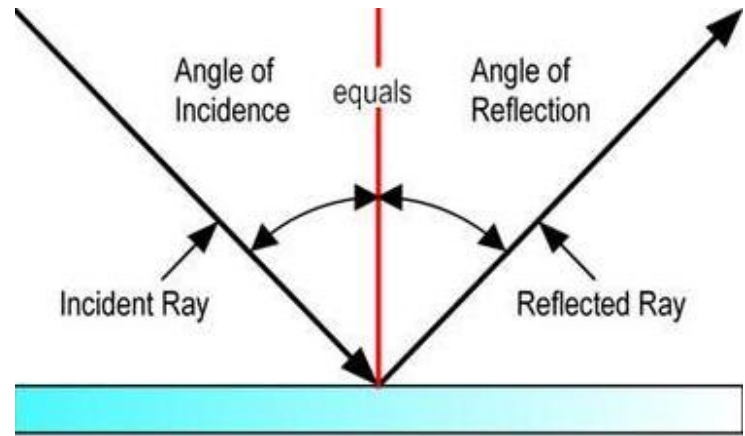
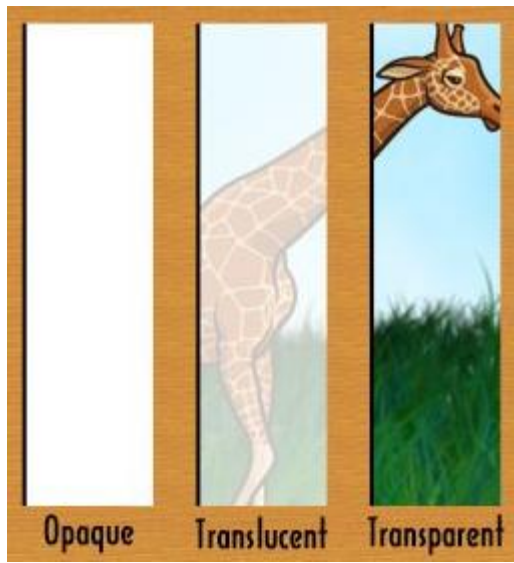
E2: The Earth is tilted and spins on its axis leading to day and night, the seasons and the climate.

E3: The Earth is made up of several layers, including a relatively thin rocky surface which is divided into tectonic plates, and the movement of these plates leads to many geologic events (such as earthquakes and volcanoes) and geographical features (such as mountains.)

Block 1
Physics
Light

<p>Year 6 Block 1 Light Big Idea(s): P1, P3</p>	<p>Retrieval vocab: absorption, energy, particle, property, reflection, wave, mirror, incident ray, image, beam, photons, solid, opaque, transparent, object, source, vibration, percussion instrument, wind instrument, string instrument, frequency, volume, pitch, transverse wave, longitudinal wave, medium, vacuum</p> <p>New vocab: angle of incidence, angle of reflection, refraction, spectrum, translucent, medium, periscope</p> <p>Composites: I can explain how light is reflected and refracted, I can explain how light helps us to see, I can explain why shadows have the same shape as the object casting them</p>
<p>Week 1 (retrieval)</p>	<ul style="list-style-type: none"> • Know that science is a way to understand our world by carefully thinking about it and testing our guesses with observations and experiments. • Know that sound is generated when an object vibrates; some of the energy from the vibrating object is transferred to the air, making the air particles move • Know that sound is a form of energy that transfers in a longitudinal wave - like that seen in a slinky - <u>not</u> a transverse wave - like that seen in water ripples (see diagram below) • Know that sound travels through a medium (e.g. particles in the air) and thus sounds does <u>not</u> travel through a vacuum which has no particles in it at all • Know that longitudinal sound waves are detected in the ear by humans and that the brain interprets this as the sounds we hear • Know that sound travels at different speeds through different objects; it travels at around 340 metres per second in air, much slower than light travels; this is why we often hear thunder <u>after</u> we see lightning as the light reaches our eye before the sound reaches our ears • Know that pitch is how high or low a sound is and that this is determined by how many vibrations per second are being made by the vibrating object; the number of vibrations per second is called frequency • Know that volume is how loud or quiet a sound is and that this is determined by the amount of energy in the wave (e.g. from how hard or soft a percussion instrument is hit) • Know that the volume of a sound is quieter if the listener is further away from the object
<p>Week 2 (retrieval)</p>	<ul style="list-style-type: none"> • Know that light is a form of energy • Know that energy comes in different forms and can be neither created nor destroyed, only changed from one form to another • Know that we need light to see things and that darkness is the absence of light • Know that light travels in straight lines • Know that light is reflected when it travels from a light source and then ‘bounces’ off an object • Know that everything that we can see is either a light source or something that is reflecting light from a light source into our eyes • Know that the Sun is a light source, but that the Moon is not and is merely reflecting light from the Sun • Know that many light sources give off light and heat • Know that the Sun gives off light and heat when hydrogen turns into helium • Know that filaments in traditional bulbs heat up until they glow, giving off light and heat • Know that fluorescent bulbs glow when electricity adds energy to a gas within the bulb • Know that sunglasses can protect eyes from sunlight but looking at the Sun directly – even with sunglasses – can damage the eyes • Know that opaque objects block light creating shadows and light passes easily through transparent objects • Know that opacity/transparency and reflectiveness are properties of a material • Know that as objects move towards a light source, the size of the shadow increases • Know that the changing of shadow size can be shown by drawing a diagram with straight lines representing light

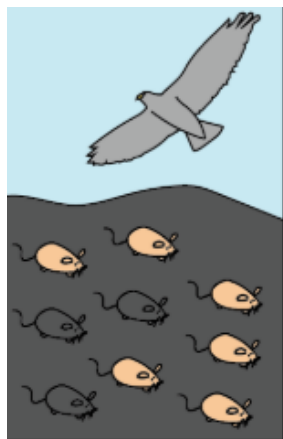
Week 3	<ul style="list-style-type: none"> • Know that translucent objects allow some light to pass through, but some of the light changes direction as it passes through the object; this means that an something seen through a translucent object is not clearly defined (see diagram below) • Know that when light passes from one medium to another (e.g. from air to water), it changes direction; this is called refraction; this happens because light travels at different speeds in different media
Week 4	<ul style="list-style-type: none"> • Know that white light comprises all the colours of light • Know that white light refracted by two surfaces in a prism will spread out so that all of its constituent colours can be seen; this array of colours is called a spectrum; it happens because the different colours that constitute white light travel at different speeds
Week 5	<ul style="list-style-type: none"> • Know how to draw a diagram to show why the shape of a shadow will match the shape of an object (see diagram below)
Week 6	<ul style="list-style-type: none"> • Know that when light reflects off an object, the angle of incidence is equal to the angle of reflection (see diagram below) • Know that a periscope takes advantage of the predictable angles of incidence and reflection to allow an image to be shown to a viewer



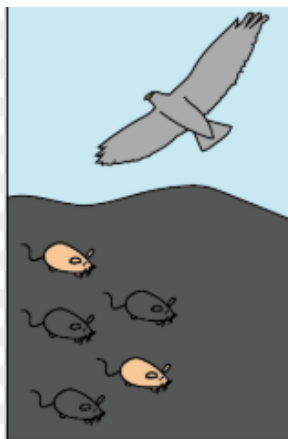
Block 2
Biology
Evolution and Adaptation

<p>Year 6 Block 2 Evolution and Adaptation Big Idea(s): B3</p>	<p>Retrieval vocab: birth, decay, energy, habitat, irreversible, extinction, microhabitat, dead, life cycle, food chain, source, nutrients, reproduction, consumption, environment, extinction, species, characteristic, adaptation</p> <p>New vocab: evolution, natural selection, variation, advantageous</p> <p>Composites: I can recognise that living things have changed over time and fossils provide information about past life, I can recognise that living things produce offspring of the same kind but not identical to the parent</p>
<p>Week 1 (retrieval)</p>	<ul style="list-style-type: none"> • Know that science is a way to understand our world by carefully thinking about it and testing our guesses with observations and experiments • Know that living things move, grow, consume nutrients and reproduce; that dead things use to do these things, but no longer do; and that things that never lived have never done these things • Know that polar bears are an example of an animal adapted to its environment – thick fur for warmth and oily paw pads to ensure that they don't freeze to the ice • Know that sharks are another example – smooth skin and streamlined shape for quick swimming; and gills for breathing underwater • Know that cacti are an example of a plant adapted to its environment – thick skin keeps a store of water safe; sharp spikes keep animals from stealing the water • Know that pine trees have thick bark and pine cones to protect against cold winters • Know that woodlice live under logs – an example of a microhabitat - as they need somewhere dark and damp so that they do not dry out • Know that frogs can live in ponds – an example of a microhabitat - as they water in which to lay their eggs (frogspawn) • Know that a species is a group of living things have many similarities that can reproduce together produce offspring • Know that changes to the environment can make it more difficult for animals to survive and reproduce; in extreme cases this leads to extinction, where an entire species dies • Know that human activity – such as climate change caused by pollution - can change the environment for many living things, endangering their existence • Know that the polar bear is a famous example of climate change endangering the existence of a species; as the climate changes and gets warmer, the sea ice on which polar bears live reduces in amount making it harder for them to survive and reproduce • Know that fossils form when a plant or animal dies and is quickly covered with silt or mud so that it cannot be rotted by microbes or eaten by scavenging animals; in time layers of sediment build, squashing the mud and turning it to stone around the dead plant or animal; the materials in the body are replaced by minerals that flow in water through the rock, leaving a rock in the shape of the animal or plant that was once there • Know that fossils can help us learn about things that lived long ago

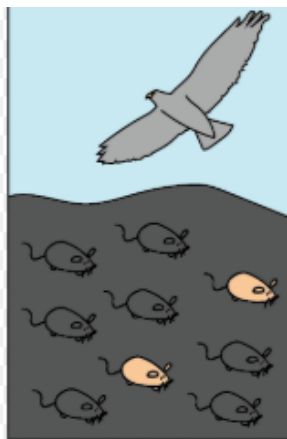
Week 2	<ul style="list-style-type: none"> • Know that all life on Earth began from a single point around 4.5 thousand million years ago • Know that living things change over time and that this gradual change is called evolution • Know that natural selection is the cause of this change; natural selection works as there is natural variation within a species; there is also competition to survive and reproduce and that members of a species with advantageous characteristics survive and reproduce - these characteristics are passed down to their offspring; members of a species with less advantageous characteristics do not survive and reproduce - these characteristics are not passed down to offspring (see diagram below) • Know that offspring that result from sexual reproduction (i.e. two parents) vary and are not identical to their parents
Week 3	
Week 4	
Week 5	<ul style="list-style-type: none"> • Know that the gradual change of species over millions of years can be observed by looking at examples of fossils
Week 6	<ul style="list-style-type: none"> • Know that Charles Darwin posited this theory of evolution by natural selection • Know that Darwin was a naturalist whose theory of evolution by natural selection developed while travelling through the Amazon rainforest • Know that Darwin's theory is accepted as fact by the scientific community • Know that Darwin did not know similarities were passed between parents and their offspring; know DNA, a chemical discovered in the 20th century, is contains the "code" that passes on information between parents and their offspring in all living things



Some mice are eaten by birds



Mice reproduce, giving next generation



A population of mice has moved into a new area where the rocks are very dark. Due to natural genetic variation, some mice are black, while others are tan.

Tan mice are more visible to predatory birds than black mice. Thus, tan mice are eaten at higher frequency than black mice. Only the surviving mice reach reproductive age and leave offspring.

Because black mice had a higher chance of leaving offspring than tan mice, the next generation contains a higher fraction of black mice than the previous generation.

Block 3
Physics
Electricity

<p>Year 6 Block 3 Electricity Big Idea(s): P1, P3</p>	<p>Retrieval vocab: circuit, component, conductor, energy, insulator, particle, property, material, appliance, charge, electron, battery, cell, bulb, buzzer, switch, wire, current electricity, static electricity, negative terminal, positive terminal, voltage, chemical reaction, emit</p> <p>New vocab: series circuit, parallel circuit, resistance, voltage</p> <p>Composites: I can recognise electrical symbols in a circuit, can associate the brightness of a bulb or volume of a buzzer with the voltage , I can explain variations in how components function</p>
<p>Week 1 (retrieval)</p>	<ul style="list-style-type: none"> • Know that science is a way to understand our world by carefully thinking about it and testing our guesses with observations and experiments. • Know that an object is made from/of a material • Know that metal is a material from which objects can be made. • Know that matter (stuff) is made from tiny building blocks • Know that electrical energy is a form of energy • Know that energy comes in different forms and can be neither created nor destroyed, only changed from one form to another • Know that static electricity is an imbalance of charged particles on a material; it does not operate by flowing around a complete circuit • Know that current electricity is the flow of charged particles called electrons around a circuit • Know that current electricity is the form of electricity that we use in our lives in lights, computers, televisions, etc • Know that electrical current flows well through some materials, called electrical conductors, and poorly through other materials, called electrical insulators • Know that conductors have free electrons (tiny, negatively charged particles) and when electrical current flows through a conductor, the electrons move like people in a queue • Know that electrical conductivity (how well a material conducts electricity) is an example of a property • Know that metals are good electrical conductors • Know that a chemical reaction inside a cell produces the charged particles that can flow around a circuit • Know that more than one cell lined up to work together is called a battery • Know that cells, batteries and the mains are all sources of electrical energy • Know that electrical current can flow if there is a complete circuit • Know that wires – which contain a conductor inside them, usually made of metal – can allow electrical current to flow around a circuit • Know that when electrical current flows through a circuit components within that circuit – such as buzzers which make a noise and bulbs which emit light – begin to work • Know that a switch functions by completing or breaking a complete circuit • Know that a simple circuit can be constructed using components • Know that exposure to high levels of electrical current can be dangerous

Week 2	<ul style="list-style-type: none"> • Know how to draw simple circuit diagrams • Know the recognized symbols for a battery, bulb, motor, buzzer and wire
Week 3	
Week 4	<ul style="list-style-type: none"> • Know how to predict whether components will function in a given circuit, depending on whether or not the circuit is complete; whether or not a switch is in an on or off position; and whether or not there is a cell to provide electrical current to the circuit
Week 5	<ul style="list-style-type: none"> • Know that voltage is a measure of the power of a cell to produce electricity; it is a measure of the ‘push’ of electric current, not the size of the electric current • Know that as the number and voltage of cells in a circuit increases, the brightness of a bulb or the volume of a buzzer will increase (though too high a voltage may ‘blow’ the bulb or buzzer)
Week 6	<ul style="list-style-type: none"> • Know that two bulbs in a circuit can be wired up to create a series circuit or a parallel circuit; if one bulb blows in a series circuit the other will not shine as the circuit has been broken; in contrast, if one bulb blows in a parallel circuit (see diagram below), there will still be a complete circuit for the other bulb so it will continue to shine; use this knowledge to explain the advantages of using parallel circuits (e.g. in the lighting in homes)



Battery



Wire



Bulb



Buzzer



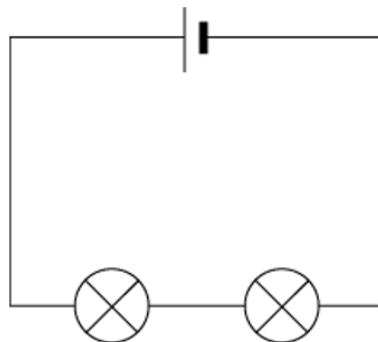
Motor



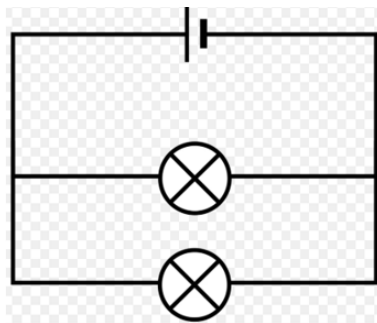
Switch (off)



Switch (on)



series circuit



parallel circuit

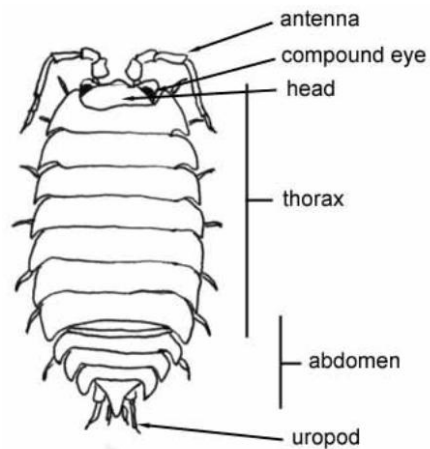
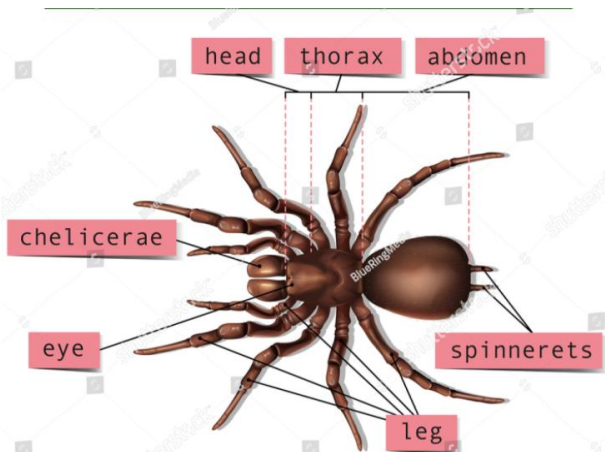
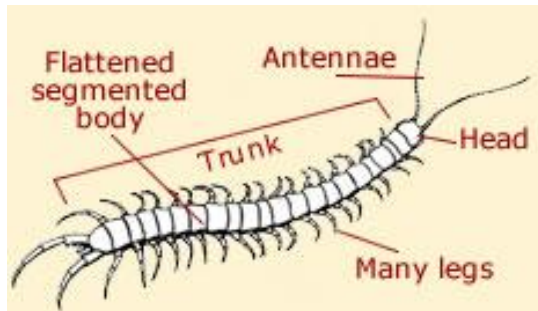
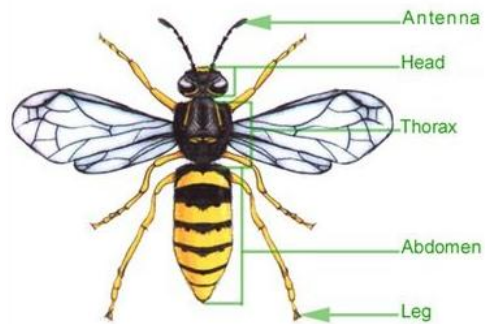
Block 4

Biology

Living Things and Their Habitats

<p>Year 6 Block 4 Living Things and Their Habitats Big Idea(s): B2</p>	<p>Retrieval vocab: component, habitat, plant, structure, fish, bird, amphibian, reptile, mammal, kingdom, classification key, species, fungi, bacteria, characteristics, offspring, vertebrate, invertebrate, insect</p> <p>New vocab: micro-organism, virus, thorax, arthropod, abdomen, arachnid, antenna, jointed limbs</p> <p>Stewardship –Stewards of God’s world</p>
<p>Week 1 (retrieval)</p>	<ul style="list-style-type: none"> • Know that science is a way to understand our world by carefully thinking about it and testing our guesses with observations and experiments. • Know that animals can be grouped based on their physical characteristics (e.g. vertebrates and invertebrates) and based on their behavior (e.g. herbivores, carnivores and omnivores) • Know that living things are divided into kingdoms: the animal kingdom, plants, fungi, bacteria, and single-celled organisms • Know that a species is a group of living things have many similarities that can reproduce together produce offspring • Know that a classification key uses questions to sort and identify different living things (see diagram below) • Know that a classification key can be used to identify living things
<p>Week 2 (retrieval)</p>	<ul style="list-style-type: none"> • Know that living things move, grow, consume nutrients and reproduce; that dead things use to do these things, but no longer do; and that things that never lived have never done these things • Know that a trout is an example of fish, a frog is an example of an amphibian; a lizard is an example of a reptile; a robin is an example of a bird; a rabbit and a human are examples of a mammal • Know that fish, amphibians, reptiles, birds and mammals are similar in that they have internal skeletons and organs; these are known as vertebrates, which means they are animals that have a backbone • Know that fish are different to other animals in having gills so that they can breathe underwater and have scaly skin • Know that amphibians are different to other animals in that they begin their lives with gills but then develop lungs and breath on land • Know that reptiles are different to other animals in that they breath air and have scaly skin • Know that birds are different to other animals in that they have feathers and wings • Know that mammals are different to other animals in that they have fur/hair and they feed milk to their young • Know that a food chain traces the path of energy through a habitat • Know that the arrows in a food chain show the direction that energy is travelling through a habitat • Know that all energy for a food chain initially comes from the Sun which is absorbed and turned into energy by plants which are called producers • Know that consumers take in energy by eating • Know that an animal that is eaten by another is called prey, and that an animal that eats other animals is called a predator • Know that the first consumer in a food chain is called a primary consumer, the second is called a secondary consumer and above it is called a tertiary consumer (see diagram below)

Week 3	<ul style="list-style-type: none"> • Know that there are three types of micro-organism: viruses, fungi and bacteria; of these three, viruses are often not really considered to be alive by many scientists mainly because they don't have the 'machinery' to reproduce inside them • Know that germs are disease-causing micro-organisms
Week 4	<ul style="list-style-type: none"> • Know that an arthropod is an invertebrate with a hard, external skeleton and jointed limbs • Know that insects are a type of arthropod; their bodies consist of six legs, a head, a thorax and an abdomen; most insects also have a pair of antennae and a pair of wings (e.g. wasp) (see diagram below) • Know that an arachnid (e.g. spider) is a type of arthropod with eight legs and no antennae or wings (see diagram below)
Week 5	<ul style="list-style-type: none"> • Know that a crustacean is a type of arthropod with two pairs of antennae (e.g. woodlouse) (see diagram below) • Know that a myriapod is an arthropod with a flat and long or cylindrical body and many legs (e.g. centipede) (see diagram below)
Week 6	<ul style="list-style-type: none"> • Know that Jane Goodall is an anthropologist, most famous for her study of chimpanzees, of which she is considered the world's foremost expert • Know that Goodall discovered that chimpanzees are much more intelligent than they had ever been thought to be • Know that Goodall is also a conservationist and environmentalist, which means she does important work to help protect the planet, in particular animal habitats



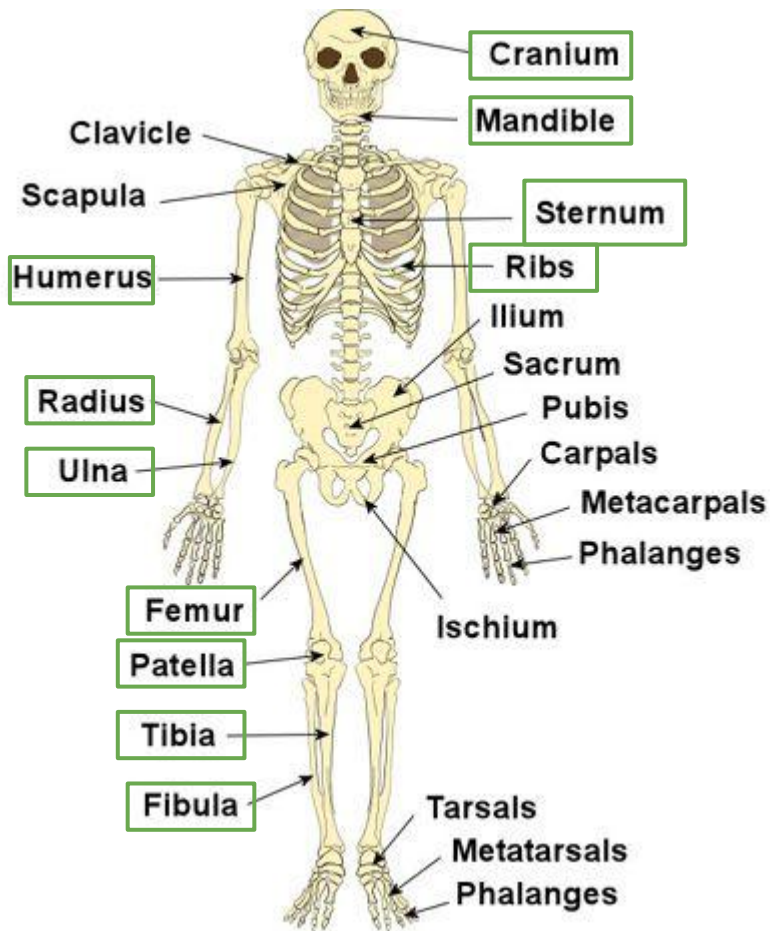
Block 5

Biology

Animals Including Humans

<p>Year 6 Block 5 Animals Including Humans Big Idea(s): B1</p>	<p>Retrieval vocab: component, energy, growth, survival, nutrients, consumption, skeleton, ribcage, protein, carbohydrate, fat, digestion, skeleton, organ, digestion, excretion, peristalsis, anus, duodenum, small intestine, large intestine, stomach, rectum, oesophagus, tongue, saliva, acid, bile, enzymes, incisors, canines, molars</p> <p>New vocab: artery, aorta, atrium, blood vessels capillary, circulatory system, vein, pulse, ventricle, replenished, resting heart rate, body, cranium, mandible, sternum, vertebrae, femur, tibia, fibula, patella, humerus, radius, ulna</p> <p>Dignity of the human person – Each person is unique and irreplaceable – everyone matters</p>
<p>Week 1 (retrieval)</p>	<ul style="list-style-type: none"> • Know that science is a way to understand our world by carefully thinking about it and testing our guesses with observations and experiments • Know that living things move, grow, consume nutrients and reproduce; that dead things used to do these things, but no longer do; and that things that never lived have never done these things • Know that animals, including humans, need food, water and air to survive • Know that people need to exercise often to help their body stay strong and fit • Know that keeping clean, including washing and brushing teeth, is an important part of staying healthy • Know that there are food groups: fruit and vegetables, carbohydrates, protein, dairy, fat and sugary foods • Know that proteins are good for growth, carbohydrates for energy and fruit and vegetables provide vitamins and minerals which help keep us healthy (e.g. calcium for healthy bones and teeth)
<p>Week 2 (retrieval)</p>	<ul style="list-style-type: none"> • Know that more than half of our diet should be made up of carbohydrates, fruit and vegetables • Know that fats and sugary foods should be eaten rarely and in small amounts • Know that getting the right amount of each food group (including over half of the diet made up of fruit, vegetables and carbohydrates) is called a balanced diet • Know that a lack of a nutrient can cause ill health; for example, a lack of vitamin D leads to a disease called rickets • Know that excess of a food group can cause ill health, such as tooth decay due to excess sugar
<p>Week 3 (retrieval)</p>	<p><i>NB – some food groups are difficult to afford for some families so sensitivity is required in teaching this area</i></p> <ul style="list-style-type: none"> • Food passes through the body with the nutrients being extracted and the waste products excreted, and this process is called digestion • The process of digestion involves breaking complex foodstuffs into simpler building blocks that can be absorbed by the body • Know that the process of digestion begins with food being chewed in the mouth by the teeth and saliva added • Know that a human has three types of teeth – incisors, canines and molars – and that these each perform different functions • Know that incisors slice food, canines tear food (especially meat) and that molars grind food • Know that children develop an initial set of teeth which are gradually replaced between the ages of 6 and 12 • Know that food is squeezed down the oesophagus towards the stomach in a wave-like action called peristalsis (see diagram below) • Know that the stomach releases acid and enzymes to continue breaking down the food; the stomach is an organ; an organ is a part of living thing that is self-contained and has a specific important job • Know that further enzymes and bile break down the food further as it moves through the duodenum towards the small intestine • Know that the small intestine adds more enzymes and then absorbs the nutrients • Know that the large intestine absorbs water from the undigested food • Know that undigested food is stored in the rectum before being excreted through a muscle called the anus • Know that skeletons provide support for muscles and protect the body; for example, the rib cage protects the vital organs in the human body

Week 4	<ul style="list-style-type: none"> • Know the names of key bones in the body, including the rib cage, cranium, mandible, sternum, vertebrae, femur, tibia, fibula, patella, humerus, radius and ulna; know how to label these on a diagram of the human body • Know that an adult human body has 206 bones, the longest of which is the femur • Know that the heart and lungs are organs protected by the ribcage and understand this as a part of the skeleton
Week 5	
Week 5	



Block 6

Biology

Animals Including Humans

<p>Year 6 Block 6 Animals Including Humans Big Idea(s): B1</p>	<p>Retrieval vocab: component, energy, growth, survival, nutrients, consumption, skeleton, ribcage, protein, carbohydrate, fat, digestion, skeleton, organ, digestion, excretion, peristalsis, anus, duodenum, small intestine, large intestine, stomach, rectum, oesophagus, tongue, saliva, acid, bile, enzymes, incisors, canines, molars</p> <p>New vocab: artery, aorta, atrium, blood vessels capillary, circulatory system, vein, pulse, ventricle, replenished, resting heart rate, body</p> <p>Dignity of the human person – Each person is unique and irreplaceable – everyone matters Dignity of the worker – Solidarity – We face challenges together</p>
<p>Week 1</p>	<ul style="list-style-type: none"> • Know that the heart beats, pumping blood around the body and that blood vessels carry the blood; arteries carry blood away from the heart; veins carry blood towards the heart; capillaries are tiny blood vessels that connect arteries and veins • Know that the heart is composed of four chambers: two atria and two ventricles; the aorta is the largest artery in the body and most major arteries branch off from it (see diagram below)
<p>Week 2</p>	<ul style="list-style-type: none"> • Know that blood travels around the body transporting nutrients that have been absorbed into the bloodstream from digestion; blood also absorbs oxygen from the lungs and carries it around the body which is used to power the body; this use of oxygen to create energy is called respiration
<p>Week 3</p>	<ul style="list-style-type: none"> • Know that when we exercise, our heart beats more frequently so that the oxygen that is used around the body can be replenished; it returns to a resting heart rate afterwards; fitter people tend to have lower resting heart rates

Week 4	<ul style="list-style-type: none"> • Know that drugs are chemicals that have an impact on the natural chemicals in a person's body; know that drugs can be harmful or helpful, depending on what they are and how they are used; know that all drugs can be harmful if overused • Know that paracetamol and aspirin are examples of drugs that can be helpful as a painkiller • Know that cannabis and cocaine are examples of illegal drugs that can have serious negative effects • Know that alcohol and tobacco are examples of drugs that are legal to adults but that can have serious negative effects, such as liver disease and lung disease, respectively
Week 5	
Week 6	<ul style="list-style-type: none"> • Know that there are many kinds of jobs as a scientist that fall into these categories: communicator scientist, developer scientist, entrepreneur scientist, explorer scientist, investigator scientist, regulator scientist, teacher scientist, technician scientist, policy scientist and business scientist https://sciencecouncil.org/about-science/10-types-of-scientist/ • Know that policy scientists use their science and technical knowledge, as well as their understanding of government and policy making, to ensure that legislation and policy have a sound evidence base. Some policy scientists describe themselves as 75% scientist and 25% politician. • Know that a business scientist helps businesses to make evidence-informed decisions

Working Scientifically: Enquiries

<u>Topic</u>	<u>Small Question</u>	<u>Enquiry</u>	<u>Big Idea(s)</u>	<u>Enquiry Type</u>	<u>Working Scientifically Skill</u>
Light	Why can I hear round corners but not see round corners?	Chn to use mirrors and torches to investigate how light travels in straight lines and reflects off mirrors.	P3: Energy, which cannot be created or destroyed, comes in many different forms and tends to move away from objects that have lots of it.	noticing patterns	Sc6/1.5, Sc6/1.6
Electricity	Is it possible to change how bright a bulb is or how loud a buzzer is?	Chn create circuits to investigate the effect of different voltages on different components.	P3: Energy, which cannot be created or destroyed, comes in many different forms and tends to move away from objects that have lots of it.	Noticing patterns	Sc6/1.1, Sc6/1.4, Sc6/1.6
Living Things and Their Habitats	What make bread rise?	Chn are shown how yeast, sugar and warm water causes a reaction; they then investigate what happens to this reaction when they change particular variables of their choice (sugar/no sugar, water temperature, adding chemicals, etc)	B3: The different kinds of life, animals, plants and microorganisms, have evolved over millions of generations into different forms in order to survive in the environments in which they live.	Observing over different periods of time Fair testing	Sc6/1.1, Sc6/1.2, Sc6/1.3, Sc6/1.4, Sc6/1.6 (enquiry write up) , Sc6/1.7
Evolution and Adaptation	Why do different species of animals look different?	Chn sort various species of animals into the environments in which they are adapted based on their physical attributes and listed behaviours	B3: The different kinds of life, animals, plants and microorganisms, have evolved over millions of generations into different forms in order to survive in the environments in which they live.	Grouping and classifying	Sc5/1.6
Animals Including Humans	Is our heart rate always the same?	Chn to investigate the effect of exercise on heart rate and how long it takes for their pulse to return to the resting rate after exercising for a minute.	B1: Living things are special collections of matter that make copies of themselves, use energy and grow. (The faster heartbeat is to get oxygen round the body so that energy can be used in the muscles.)	Noticing patterns	Sc6/1.1, Sc6/1.2, Sc6/1.3, Sc6/1.4, Sc6/1.6 (enquiry write up)
Animals Including Humans	How long does it take to get fitter?	Over the course of a month, chn investigate whether some volunteers (who do consistent exercise at break time) can lower their resting heart rate.	B1: Living things are special collections of matter that make copies of themselves, use energy and grow.	Observing over different periods of time.	Sc6/1.1, Sc6/1.2, Sc6/1.3, Sc6/1.4, Sc6/1.6