



Key Knowledge

Need to know

- Recognise that light appears to travel in straight lines.
- Understand that because light travels in straight lines, objects are seen because they give out or reflect light into the eye.
- Explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes.
- To know that because light travels in straight lines, shadows have the same shape as the objects that cast them.
- To know that white light is made up of a spectrum of 7 colours.

Neat to know

- To know the function of the parts that make up the human eye.

Working Scientifically

Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.

Explain degree of trust in results.
Identify and evaluate scientific evidence (their own and others') that has been used to support or refute ideas or arguments.

Key Person



Sir Isaac Newton
invented the first
reflective telescope in

Vocabulary

light wave	Light can be defined by its wavelength and frequency. The frequency is how fast the waves vibrate up and down.	
light source	Light, or illumination, is a form of energy that travels in waves, like sound.	
reflection	The throwing back by a body or surface of light without absorbing it.	
refraction	The bending of a ray when it passes at an angle from one medium into another in which its speed is different	
shadow	A dark area or shape produced by a body coming between rays of light and a surface.	
convex	A lens that curves inwards.	
concave	A lens that curves outwards.	
eye	A globular organ of sight in the head of humans and vertebrate animals.	
filters	A filter is a transparent material that absorbs some colours and allows others to pass through.	



Key Knowledge

Need to know

- Know that the brightness of a bulb is associated with the voltage.
- Compare and give reasons for variations in how components function such as switches, bulbs, buzzers and motors.
- Know and use recognised symbols when representing a simple circuit in a diagram.
- Know the components needed to construct simple series circuits.
- To know what changes a switch, bulb, buzzer and motor makes to a circuit.

Neat to know

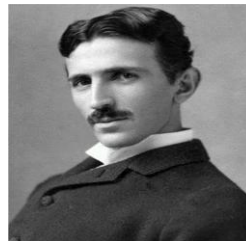
- Understand what AC and DC is, and how Nikola Tesla developed this discovery.

Working Scientifically

Plan different types of scientific enquiries to answer their own questions, including recognising and controlling variables where necessary.

Report and present findings from enquiries, including conclusions and causal relationships, in oral and written forms such as displays and other presentations, using appropriate scientific language.

Key Person



Nikola Tesla is credited with discovering and developing the invention of the alternating current (AC).

Vocabulary

circuit	A closed path that allows electricity to flow from one point to another.	
series circuit	A series circuit is one that has more than one resistor, but only one path through which the electricity flows.	
current	An electric current is a stream of charged particles, moving through an electrical conductor/space.	
conductor	Materials that let electricity pass through them easily.	
insulator	A substance that does not readily allow heat sound or electricity to pass through.	
cells	A device that is used to generate electricity, or one that is used to make chemical reactions possible by applying electricity.	
volts	Voltage is an electrical potential difference between two places.	
watts	A measure of an appliances power.	



Evolution and Inheritance

Key Knowledge

Need to know

- Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago.
- To know that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents.
- To know that animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.
- To know that variation in offspring over time can make animals more or less able to survive in different environments.

Neat to know

- To know that Charles Darwin developed the theory of how species evolve (change or develop) over time.
- To understand that natural selection is where the most desirable characteristics are passed on to offspring to give them more chance of surviving.
- To understand the importance of Mary Anning's discoveries.

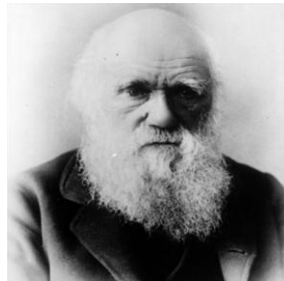
Working Scientifically

Explain degree of trust in results.

Identify *and evaluate* scientific evidence (*their own and others'*) that has been used to support or refute ideas or arguments.

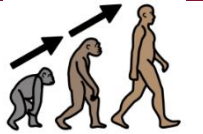
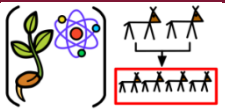
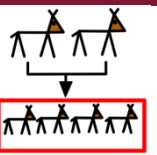
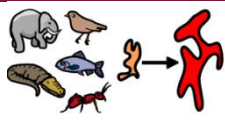
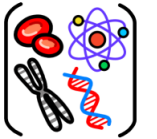
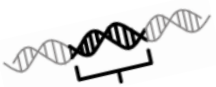
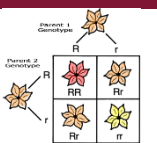
Report and present findings from enquiries, including conclusions and causal relationships.

Key Person



Charles Darwin is known for his theory of evolution by natural selection

Vocabulary

evolution	The theory that all the kinds of living things that exist today developed from earlier types.	
inheritance	When living things reproduce they pass on characteristics to their offspring.	
offspring	All living things produce offspring of the same kind, but normally offspring are not identical to their parents.	
adaptation	Adaptation is the process by which animals, plants and other living things have changed so that they better suit their habitat.	
genes	Genes that are passed on to you determine many of your traits, such as your hair colour.	
chromosome	Chromosomes are tiny structures inside cells made from DNA and protein.	
genotype	A genotype refers to a particular gene or set of genes carried by an individual.	
palaeontology	The study of life of past geological periods, as known from fossil remains.	



Animals, including humans

Key Knowledge

Need to know

- Identify and name the main parts of the human circulatory system including the heart, lungs, veins and arteries.
- To know the four main chambers of the human heart.
- To know that diet, exercise, drugs and lifestyle can impact the health of the heart.
- To know the components of the blood and their different functions including clotting, fighting infections, transporting oxygen and nutrients.

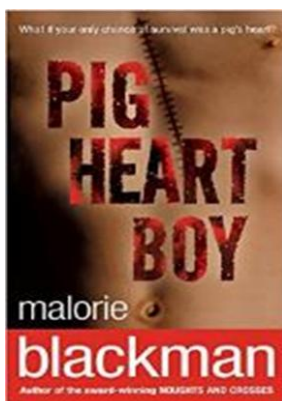
Neat to know

- To know the process of gaseous exchange in the lungs and how this process oxygenates the blood.
- To know who William Harvey was and how his findings on the circulatory system underpinned what we know today.

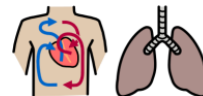
Working Scientifically

- Report and present findings from enquiries.
- Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.
- Identify and evaluate scientific evidence (*their own and others'*) that has been used to support or refute ideas or arguments.

Text



Vocabulary

heart	The human heart is a muscle the size of your fist that works like a pump sending blood around your body.	
lungs	The lungs are bag-like organs that are part of the respiratory system. The inhale oxygen and exhale carbon dioxide.	
cardiovascular	The blood circulatory system (cardiovascular system) delivers nutrients and oxygen to all cells in the body.	
blood vessel	Blood vessels are a series of tubes inside your body. They move blood to and from your heart.	
vein	A vein is a type of blood vessel that has the job of carrying deoxygenated blood away from the body's tissues and back to the heart.	
capillaries	Capillaries are very thin blood vessels. They bring nutrients and oxygen to tissues and remove waste products.	
pulse	Your heart has to push so much blood through your body that you can feel a little thump in your arteries each time the heart beats.	
drugs	A drug is a chemical that is not food and that affects your body. Some drugs are given to people by doctors to make them healthy.	



Key Knowledge

Need to know

- Know that living things are made up of plants, animals, bacteria, fungi and viruses.
- Know that living things are classified into broad groups according to common observable characteristics and based on similarities and differences.
- To know that micro-organisms are living things, and that they can be both helpful and harmful.
- To know that Carl Linnaeus was a famous taxonomist who developed 'the Linnaean classification system' to classify living things.

Neat to know

- Know that plants and animals can be classified based on specific characteristics.
- To know there are sub categories of invertebrates including crustaceans, molluscs, annelids, insects, arthropods, arachnids and echinoderms.
- To know that some living things have multiple characteristics which challenge taxonomists when classifying them.

Working Scientifically

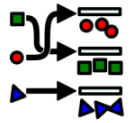
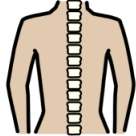
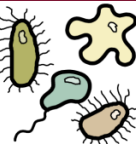
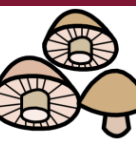
- Report and present findings from enquiries, including conclusions and causal relationships.
- Identify and evaluate scientific evidence (*their own and others'*) that has been used to support or refute ideas or arguments.
- Observe changes over a period of time and draw conclusions from these changes.
- Group and classify.

Key Person



Carl Linnaeus is famous for his work in Taxonomy, the science of identifying, naming and classifying organisms

Vocabulary

classification	The action or process of classifying something such as animals and living things.	
species	This is the grouping together of similar types of plants, animals and other organisms.	
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.	
micro-organism	Micro-organisms are tiny. They are so small they can only be seen with a microscope.	
fungi	Fungi are a group of spore-producing organisms feeding on organic matter such as moulds and yeast.	
bacteria	a member of a large group of <u>unicellular microorganisms</u> – some of which can cause disease.	
virus	An infectious agent that survives by multiplying in the cells of a host organism	