

## Science Knowledge Overview 2018-2019

	Autumn	Spring	Summer
EYFS	<p style="text-align: center;"><b><u>All about me</u></b></p> <p>The main parts of the human body are the legs, the torso, the arms and the head. There are 206 bones in the human body. <b><u>Storybook link – Funny Bones by Allan and Janet Ahlberg</u></b></p>  <p>There are many different materials in the environment around us such as wood, clothes, bricks and plastic. Words such as texture, bumpy and smooth can be used to describe properties of materials. <b><u>Storybook link – The Three Little Pigs</u></b></p>  <p style="text-align: center;"><b><u>Light and Dark</u></b></p> <p>When the sun is out, it is called day. After the sun sets, it is called night.</p> <p>There are 4 seasons: spring, summer, autumn and winter. It is cold during winter and it warms up as we go through spring and into summer. It then cools down again from summer through autumn and to winter. <b><u>Storybook link – Pumpkin Soup by Helen Cooper</u></b></p>  <p><b><u>Storybook link – We're Going on a Bear Hunt by Michael Rosen</u></b></p>  <p>Different bears have different habitats. Bears are adapted for their different habitats, for example some go into a deep sleep in the colder months.</p>	<p style="text-align: center;"><b><u>Out of this world</u></b></p> <p>There are 8 planets in our solar system: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune. Neil Armstrong and Buzz Aldrin were the first two people to step foot on the moon. Astronauts need special equipment for travelling to space (for example space suits).</p>  <p>There are many different plants in the world around us. Some are flowers and some are trees. Plants need good levels of sunlight, water and warmth to be healthy – we will experiment with these.</p>  <p>A bean plant grows from a seed, through germination, then produces leaves and finally flowers to produce more seeds. <b><u>Storybook link – Jack and the Beanstalk</u></b></p> <p>A chicken starts as an egg. It then becomes a hatchling, grows into a chick before finally becoming a chicken – we will hatch these. Chicks need warmth, humidity and ventilation to hatch. Once they hatch they need warmth, ventilation, food and water until they can fend for themselves.</p> 	<p style="text-align: center;"><b><u>All creatures great and small</u></b></p> <p><b><u>Core knowledge</u></b> Palaeontologists are people that study dinosaurs. Many different dinosaurs used to live on the planet. A large asteroid hit Earth 66 million years ago and caused the mass dinosaur extinction. <b><u>Storybook link – Harry and His Bucketful of Dinosaurs by Ian Whybrow and Adrian Reynolds</u></b></p>  <p>The planet can be looked after by recycling.</p>  <p>Some materials that we can recycle are paper, certain plastics, cardboard and metal cans. Some materials are called insulators so they keep heat in.</p> <p>Some insulating materials are cork, foam and wool. Materials can float or sink, for example a rubber duck floats – we will investigate these materials.</p> <p>Butterflies begin as eggs. They then become caterpillars. The next stage is chrysalis before they then become a butterfly. We will hatch butterflies. <b><u>Storybook link – The Very Hungry Caterpillar by Eric Carle</u></b></p>  <p>We get lots of food from farms, for example milk and meat. Healthy foods include fruit and vegetables. Exercise can keep us healthy. Exercise has different effects on the body, such as getting hot, breathing heavier and making our hearts beat faster.</p>

Year  
1

### Animals

#### Core knowledge

Animals need food, water and space.  
Different animals have different habitats.  
Some groups of animals are amphibians, mammals, birds and fish.  
They get food from plants and other living things.  
Offspring are like their parents but not exactly the same.  
Most babies need to be fed and cared for by their parents. Pets need caring for by their owners.

**People of interest – Jane Goodall (Primatologist - studied Chimpanzees)**



### Human Bodies and Senses

#### Core knowledge

Humans have five senses related to different body parts.  
Taking care of your body includes maintaining a balanced diet and exercising regularly.  
Different parts of the eye have different purposes.  
Sounds can be very different and they travel through our ears to our brain.  
Some people's senses do not work properly, and sometimes they can use things to help them.

Senses can warn you of danger.  
**People of interest – Helen Keller (became deaf and blind at 19 months)**



### **Working Scientifically (throughout the term)**

Ask their own questions about what they notice.  
Identify and classify.  
Use the appropriate scientific language to communicate their ideas.  
Notice and explain differences.  
Use simple equipment.

### Taking care of the Earth

#### Core knowledge

Some resources are limited and therefore should be looked after e.g. rainforests.  
Building roads can destroy habitats so we need to think carefully about which land we build on.  
We can save energy in the home, for example by turning off lights and taps.  
Conservation is the protection of things found in nature.  
Pollution can be harmful, so we can help reduce it by picking up litter and reducing water and air pollution.



### Weather and seasons

#### Core knowledge

There are four seasons on Earth: spring, summer, autumn and winter.  
We need the sun for light and warmth.  
The weather can change throughout the day.  
Colder weather comes in autumn and winter. Warmer weather comes in spring and summer.  
You can gather information about weather using equipment such as rain gauges, thermometers and wind vanes.



Clouds are made of tiny droplets of water that float in the air.  
Scientists study the weather to make forecasts.  
Some weather can be very dangerous, such as floods and hurricanes.

### **Working scientifically (throughout the term)**

Recording temperatures  
Creating weather charts.  
Use simple equipment (thermometers, wind vanes)

### Plants

#### Core knowledge

Plants need warmth, light and water to grow.  
Plants have seeds, roots, stems and leaves.  
Plants make their own food.  
We eat some types of plants. For example: root – carrots; leaves – lettuce; and seeds – peas.  
Deciduous trees lose their leaves during autumn and grow new leaves during spring.  
Evergreen trees don't lose their leaves.  
Plants spread their seeds in different ways to reproduce.

**Person of interest - Joseph Banks (Botanist)**



### Materials and Magnets

#### Core knowledge

There are many materials that are widely used in our environment: wood, plastic, rock, metal.  
Different materials are suitable for different purposes, for example wool is often used to clothing.  
Some materials are natural (cotton), and some are man-made (nylon).  
A magnet is made of metal.  
Some metal is magnetic (iron), and some metal is not magnetic (silver).  
Magnets are everywhere, for example on our fridge, inside car motors and in scrapyards.  
Different magnets have different strengths.

**People of interest - Wilburn and Orville Wright (first aeroplane)**



### **Working scientifically (throughout the term)**

Observations over time  
Ask simple questions.  
Identify and classify magnetic materials.  
Perform simple tests.

Year  
2

### Living Things and their Environments

#### Core knowledge

Different animals live in their own specific habitats. Animals don't make their own food. They can be herbivores, carnivores or omnivores. Plants need nutrients from the soil, water, sun-light and air.

Animals and plants form the food chain.

Locate the Atlantic and Pacific Oceans.

Learn about coasts, shores, waves, tides and currents in the ocean.

There is a large diversity of ocean life and many species may not have been discovered yet.

There are many dangers to the ocean. Environments are changing because of increases in population and this can be a danger to habitats.

Learn how we can reduce, reuse and recycle to help the environment.

**People of interest – David Attenborough (naturalist); Amanda Vincent (marine biologist and conservationist, project seahorse)**



#### **Working Scientifically (throughout the term)**

Ask their own questions about what they notice.

Use appropriate scientific vocabulary to communicate their ideas.

Notice and explain changes and differences.

Identify and classify.

Use secondary sources of information to find things out.

### The Human Body: Systems and Preventing Illness

#### Core knowledge

The skeleton is made up of bones that support our bodies (skeletal system).

Muscles wrap around bones and stretch from one bone to another. They help us to move (muscular system).

Our bodies break down food and use the nutrients to keep us moving around (digestive system).

The circulatory system moves blood around our bodies.

The nervous system carries messages around our body to our brain and back again.

We can prevent illnesses by keeping hygienic, exercising and eating healthy.



Medicines and vaccinations can help prevent illnesses.

**People of interest - Edward Jenner (Smallpox) and Louis Pasteur**



#### Matter

#### **Properties of Matter: Measurement**

#### Core knowledge

There are three states of matter: solid, liquid or gas.

Some materials can change state, for example from a solid to a liquid (melting ice) and vice versa.

Objects can be classified according to the material they are made from, and their physical properties.

You can measure length using standard units (mm, cm and m) and non-standard units.

You can measure capacity using litres and millilitres.

We measure temperature in degrees Celsius.

**Person of interest - Rosalind Franklin (double-helix structure DNA)**



#### **Working scientifically (throughout the term)**

Use simple equipment.

Gather and record data, including taking measurements.

Use observations and ideas to suggest answers to questions they have.

### Electricity

#### Core knowledge

Electricity can be dangerous, and so there are several safety rules you must follow when using electricity.

Everyday appliances use electricity to move, heat up, make light etc.

A battery has a positive and negative pole.

A circuit must be complete in order for it to work.

Insulators are used to make electricity safe, for example plastic coatings around a wire.

Some materials are conductive (they let electricity pass easily) and some are non-conductive (they do not let electricity pass easily).

**Person of interest - Thomas Edison**



#### **Astronomy and The Earth**

#### Core knowledge

The sun is our star.

There are eight planets in the solar system – Pluto is now a dwarf planet.

Constellations are groups of stars.

The Earth orbits the sun and the Moon orbits Earth.

The sun rises and then sets as the Earth rotates. This causes day and night.

Earth is made of 3 layers: crust, mantle and core.

Volcanoes and geysers can erupt and send matter such as steam or molten rock into the sky.

Igneous, sedimentary and metamorphic are all types of rocks.

**Person of interest - Neil de Grasse Tyson (Astrophysicist)**



#### **Working scientifically (throughout the term)**

Test conductors and insulators.

Create simple circuits.

Gather and record simple data.

Make observations.

Year  
3

### Rocks & Soils

#### Core knowledge

Rocks can be compared and grouped based on their appearance and physical properties.  
Soil is made from rocks and organic matter.  
Rocks are made from several minerals and are formed in three different ways.  
Fossils are formed in sedimentary rocks.  
This process is called fossilisation.

**Person of interest – Barnum Brown**  
**(palaeontologist)**



### Electricity

#### Core knowledge

Electricity in the home or power stations can mean the movement of small particles or 'charges'.  
Static is a type of electricity.  
Sparks happen when charges move to become balanced.  
Magnets have two poles, opposite poles attract and like poles repel.  
Electrical charges always have invisible electric 'fields'.  
Electricity requires a complete path to flow.



Some materials are better at letting electrical currents through them than others.  
Magnets and electricity can affect each other.  
Electricity can be made in different ways.  
**Person of interest – Sir Joseph John Thomson**  
**(discovery of electrons)**

#### **Working scientifically (throughout the term)**

Use secondary sources of information to provide evidence.  
Identify and classify materials and then justify reasons.  
Identify common appliances that run on electricity and identify the range of electrical circuits.  
Define variables and practise the skill of applying the terms 'independent' and 'dependent' variables.  
Make and justify a prediction.  
Design a question to investigate.  
Draw accurate and neat, labelled simple circuit diagrams.

### Geology, Mixtures & Separation

#### Core knowledge

A solute is the thing that gets dissolved. A solvent is the thing that does the dissolving.  
Earth and everything on/in it is essentially a mix of solids, liquids and gases.  
A 'mixture' describes the combination of different components in a substance.  
Clouds are a mixture of gases (air and water).  
Some materials will dissolve in liquid to form a solution.  
The type of solution is determined by whether the solvent is a solid, liquid or gas.  
There are a variety of separating techniques and some mixtures are quite hard to separate.  
Everything will dissolve in water eventually.  
Earth is made up of layers.  
**Person of interest – James Hutton**  
**(founder of modern geology)**



#### **Working scientifically (throughout the term)**

Make predictions  
Select which data to record in a scientific way and begin to tabulate data.  
Begin to use graphs to display data.  
Spot patterns in data.  
Describe how to recover a substance from a solution.  
Identify a solvent and solute.  
Decide how mixtures might be separated.  
Recognise a reversible and an irreversible reaction.  
Compare and group together different kinds of rocks by their appearance and simple physical properties.  
Explore different soils.  
Identify similarities and differences between what happens when rocks are rubbed together, and what changes occur when they are in water.

### Environment, Ecology & Evolution

#### Core knowledge

The main habitats on Earth include forests, grasslands, deserts, tundra, freshwater, marine and mountains.  
Organisms need water, oxygen, food, warmth and shelter.  
Life has changed over time.  
All 'life' on Earth is classified into 1 of 5 kingdoms.  
There are a large variety of plants within the plant kingdom.  
Plants can be classed as flowering and non-flowering.  
Pollination is needed to create more plants. Bees help with this.  
Decomposes recycle dead plants and animals into nutrients to put back into soil.  
There is a wide variation in the reproduction process for different animals.  
A food chain shows the transfer of energy from prey to predators.  
Organisms adapt to survive in their habitats.  
The law of evolution is that living organisms have developed from earlier forms during the history of Earth.  
**Person of interest: Charles Darwin**  
**(natural selection)**



#### **Working scientifically (throughout the term)**

Examine your results and discuss the validity.  
Simply state 'this data is not valid because...'  
Record some simple data.  
State simply what your data 'appears' to suggest.  
Identify problems with your experimental design.  
Design an experiment/observation to test an idea about seeds and plants.  
Evaluate whether the idea created valid data or not.  
Use simple classification trees.  
Design and build scientific equipment (mini bioreactor).  
Undertake experiments over an extended period of time.  
Study plants with care, sensitivity and caution.  
Recreate simple food chains.

Year  
4

### Classification of animals

#### Core knowledge

Animals can be classified based on their characteristics. Vertebrates are separated into five different classes. Each animal class has basic characteristics that define them, for example mammals are warm-blooded and produce live young.

Living things can be defined as producers, predators and prey.

Food chains show how energy passes from prey to predators.

As the environment changes it can be a danger to animals, for example deforestation destroys habitats.

**Person of interest – Steve Irwin (zoologist, animal conservation)**



### Electricity

#### Core knowledge

Electricity can mean the movement of small particles or 'charges', that can be negative or positive. Learn how to produce static electricity.

Friction transfers charges, making one material become negatively charged and the other becoming positively charged.

Sparks happen when charges move to become balanced. An electrical current flows through the wires when the circuit is complete.

Explain the connection between switches and whether a component will work or not.

Conductors let the electrical current flow freely. Non-conductors do not let electrical currents through.

Magnets and electricity can affect each other.

Electricity can be made in different ways.

**People of interest – Sir Joseph John Thomson (discovery of electrons)**



#### **Working scientifically (throughout the term)**

Identify and classify animals into groups using a range of keys and diagrams.

### Sound

#### Core knowledge

Sound is created by vibrations travelling through a medium to the ear.

Features of an object can alter the pitch of a sound.

A stronger vibration creates a sound of a higher volume.

As the source of a sound gets further away, the sound gets fainter.

**Person of interest: Leonardo DaVinci (sound waves)**



### Geology, Mixtures & Separation

#### Core knowledge

A solute is the thing that gets dissolved. A solvent is the thing that does the dissolving.

Earth and everything on/in it is essentially a mix of solids, liquids and gases.

A 'mixture' describes the combination of different components in a substance.

Clouds are a mixture of gases (air and water).

Some materials will dissolve in liquid to form a solution.

The type of solution is determined by whether the solvent is a solid, liquid or gas.

There are a variety of separating techniques and some mixtures are quite hard to separate.

Everything will dissolve in water eventually.

Earth is made up of layers.

There are 3 main classifications of rocks: igneous, sedimentary and metamorphic.

Rocks can be grouped based on their properties.

Fossils are formed in rocks and tell us about life in the past.

**Person of interest: Janet Vida Watson (geologist, chronology)**



#### **Working scientifically (throughout the term)**

Make predictions

Select which data to record in a scientific way and begin to tabulate data.

Begin to use graphs to display data.

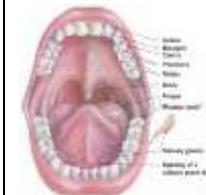
Spot patterns in data.

### Teeth & digestion

#### Core knowledge

There are four types of human teeth: incisors, canines, premolars and molars.

Each type of tooth has a specific function.



The human digestive system is made up of many parts. The basic parts are the mouth, oesophagus, stomach, large intestine, small intestine and colon. They each play an important role in the digestive system.

### Environment, Ecology & Evolution

#### Core knowledge

The main habitats on Earth include forests, grasslands, deserts, tundra, freshwater, marine and mountains.

Organisms need water, oxygen, food, warmth and shelter. Life has changed over time.

All 'life' on Earth is classified into 1 of 5 kingdoms.

There are a large variety of plants within the plant kingdom.

Plants can be classed as flowering and non-flowering. Pollination is needed to create more plants. Bees help with this.

Decomposes recycle dead plants and animals into nutrients to put back into soil.

There is a wide variation in the reproduction process for different animals.

A food chain shows the transfer of energy from prey to predators.

Organisms adapt to survive in their habitats.

The law of evolution is that living organisms have developed from earlier forms during the history of Earth.

**Person of interest: Charles Darwin (natural selection)**



#### **Working scientifically (throughout the term)**

Examine your results and discuss the validity.

Simply state 'this data is not valid because...'

Record some simple data.

	<p>Construct and interpret food chains. Use secondary sources to find information. Identify common appliances that run on electricity and identify a range of electrical circuits. Define variables and practise the skill of applying the terms 'independent' and 'dependent' variables. Make and justify a prediction. Design a question to investigate. Draw accurate and neat, labelled simple circuit diagrams.</p>	<p>Describe how to recover a substance from a solution. Identify a solvent and solute. Decide how mixtures might be separated. Recognise a reversible and an irreversible reaction. Explore different soils. Identify similarities and differences between what happens when rocks are rubbed together, and what changes occur when they are in water.</p>	<p>State simply what your data 'appears' to suggest. Identify problems with your experimental design. Design an experiment/observation to test an idea about seeds and plants. Evaluate whether the idea created valid data or not. Use simple classification trees. Design and build scientific equipment (mini bioreactor). Undertake experiments over an extended period of time. Study plants with care, sensitivity and caution. Recreate simple food chains.</p>
<p>Year 5</p>	<p style="text-align: center;"><b><u>Electricity</u></b></p> <p><b><u>Core knowledge</u></b> All materials are made up of atoms that have protons, neutrons and electrons. Electricity is the movement of electrons and protons. Static electricity is the imbalance between electrons and protons that build up on the surface of an object. Sparks happen when electrons move between charged things. Current flows from the positive to the negative terminals on a battery. Voltage is the amount of potential energy between two points in a circuit. Current is the flow of electricity. Conductors let electrons through, whereas non-conductors don't. Magnets and coils can make an electrical current. There are different ways to generate electricity (solar, tidal etc). <b><u>People of interest – Michael Faraday (electric motor), Hans Christian Ørsted (Electromagnetism)</u></b></p>   <p style="text-align: center;"><b><u>Forces &amp; Magnetism</u></b></p> <p><b><u>Core knowledge</u></b> Forces are things we can't see. There are many different types of forces. Magnetic forces act at a distance. Earth also has a magnetic field. Some mechanisms, including levers, pulleys and gears, allow smaller force to have greater effect.</p>	<p style="text-align: center;"><b><u>Geology, Mixtures &amp; Separation</u></b></p> <p><b><u>Core knowledge</u></b> Dissolving, mixing and changes of state are reversible changes. A solute is the substance being dissolved. A solvent is a substance that does the dissolving. Chromatography is an analytical chemistry technique for the separation of mixtures. A solution is a uniform mixture of a solute (usually a solid) dissolved in a solvent (usually a liquid). The type of solution is determined by the state of matter of the solvent. A saturated solution is one in which no more solute will dissolve. Endothermic reactions absorb energy from the surroundings. Exothermic reactions release energy. You can identify substances by their solubility. Temperature affects the properties and behaviour of materials. Salt lowers the freezing point of water. Water is a 'universal solvent'. The Earth is made up of the crust, asthenosphere, mantle and inner and outer cores. The Earth's crust is made up of interconnected tectonic plates that move around on the surface of the planet. Silt, sand, loam, clay and chalk are ways to describe different soils. <b><u>People of interest – Alfred Wegener (continental drift); Margaret Thatcher (chemist – Mr Whippy)</u></b></p>  	<p style="text-align: center;"><b><u>Environment, Ecology &amp; Evolution</u></b></p> <p><b><u>Core knowledge</u></b> The main biomes (large ecosystems) on Earth include forests, grasslands, deserts, tundra, freshwater, marine and mountains. Water, oxygen, food, warmth and shelter are essential conditions for organisms to survive. Living things can be classified into 1 of 5 kingdoms. Each kingdom has unique characteristics. Plants can be classed as flowering and non-flowering. These are then classified further by more characteristics. Pollination is needed to create more plants. Bees are an example of pollinators. Decomposes recycle dead plants and animals into chemical nutrients that are released back into the soil. Food chains differ in different ecological habitats. Organisms adapt to survive in their habitats. The law of evolution is that living organisms have developed from earlier forms during the history of Earth. Natural selection is the idea that organisms adapted to survive in their environment, and these are the organisms that were more likely to reproduce. <b><u>Person of interest: Charles Darwin (theory of evolution); Nancy Moran (microbe evolution)</u></b></p>   <p style="text-align: center;"><b><u>Life Cycles</u></b></p> <p><b><u>Core knowledge</u></b> All living things have a life cycle.</p>

	<p><b><u>Person of interest – Isaac Newton (gravity)</u></b></p>  <p><b><u>Working scientifically (throughout the term)</u></b></p> <p>Describe and evaluate scientific ideas.  Identify simple mechanisms that can enhance a force.  Define questions to investigate.  Compare and give reasons for variations in how components function.  Control variables in their own investigation.  Suggest equipment and methods.  Make and justify a prediction.  Plan entire investigations and suggest risks and safety.  Use recognised symbols in a simple circuit diagrams.  Suggest contexts where electrical science and circuits are applied today and explain how they work.  Use secondary information to conduct research and form an opinion.</p>	<p><b><u>Meteorology, Earth &amp; Space</u></b></p> <p><b><u>Core knowledge</u></b></p> <p>All planets orbit the Sun.  The Earth orbits the sun, and the moon orbits the Earth.  The Earth’s orbit around the sun, and its tilt on its axis is why we have seasons.  The sun, planets and moons are approximately spherical objects.  Earth rotates over 24 hours, which is why the sun seems to move across the sky and cause day and night.  Cirrus, stratus and cumulus are all types of clouds.  Evaporation, condensation and precipitation are all parts of the water cycle.  Cold and warm fronts create our weather patterns, including storms, thunder and lightning.  Barometers measure atmospheric pressure.</p>  <p><b><u>People of interest – Copernicus (sun-centred solar system); Gabriel Fahrenheit (mercury thermometers and the Fahrenheit scale)</u></b></p>  <p><b><u>Working scientifically (throughout the term)</u></b></p> <p>Specifically identify the variables.  Graphing and tabulating data.  Begin to apply the terms solute, solvent, solution and saturation to the world around them.  Spot patterns, draw and explain conclusions.  Make accurate judgements about the accuracy and reliability of experimental data.  Identify and classify materials.  Test a range of separation techniques.</p>	<p>Reproduction in plants requires both the male and female parts of the flower – the pollen sticks to the stigma, which helps to fertiliser the seeds ready for seed dispersal.  Reproduction in animals requires both a male and a female of the same species. Offspring are similar but not genetically identical.  There are five key stages in human development: baby, child, young person or adolescent, adult and old age.</p> <p><b><u>Working scientifically (throughout the term)</u></b></p> <p>Explain and use a diagram to show the life cycle of different living things (mammals, amphibians, insects and birds).  Critically examine your results and findings to identify whether you did or did not prove the prediction.  Explain whether the results are valid, and why.  Record data and explain what the data ‘appears’ to suggest.  Identify problems with the experimental design and suggest how to improve them next time.  Using previously found data, design a scientific model to test an idea or observation further.  Use a range of classification trees.  Use scientific equipment, such as mini bioreactor.  Undertake an experiment over an extended period of time, and assess the effectiveness of the design.  Create detailed food chains.</p>
<p>Year 6</p>	<p><b><u>Classification</u></b></p> <p><b><u>Core knowledge</u></b></p> <p>Aristotle created the first classification system that only contained two groups.  Taxonomists now use the modern day classification system which comprises of 5 kingdoms.</p>	<p><b><u>Geology, Mixtures &amp; Separation</u></b></p> <p><b><u>Core knowledge</u></b></p> <p>Dissolving, mixing and changes of state are reversible changes.  Chromatography is an analytical chemistry technique for the separation of mixtures.</p>	<p><b><u>Environment, Ecology &amp; Evolution</u></b></p> <p><b><u>Core knowledge</u></b></p> <p>The main biomes (large ecosystems) on Earth include forests, grasslands, deserts, tundra, freshwater, marine and mountains.  Water, oxygen, food, warmth and shelter are essential</p>

Each classification group has a certain set of characteristics unique to it.

Micro-organisms are unseen by the naked eye. They can be harmful and helpful.

There are 7 main levels to the classification system.

**Persons of interest - Carl Linnaeus (taxonomy); Dorothy Hodgkin (penicillin and vitamin B12)**



### Electricity

#### Core knowledge

All materials are made up of atoms that have protons, neutrons and electrons.

Electricity is the movement of electrons and protons.

Static electricity is the imbalance between electrons and protons that build up on the surface of an object.

A spark between two objects will balance the electrons and protons.

Current flows from the positive to the negative terminals on a battery.

Voltage is the amount of potential energy between two points in a circuit.

Current is the flow of electricity.

Conductors allow electrons to pass through.

Magnets can be made out of coils of wire (called a solenoid).

Moving a magnet past atoms in a wire causes electromagnetic induction.

There are different methods for generating electricity. Each of these has its own pros and cons.

**People of interest – Michael Faraday (electric motor), Hans Christian Ørsted (Electromagnetism)**



#### Working scientifically (throughout the term)

Use a range of keys and diagrams to classify living things.  
Use secondary information to conduct research and form an opinion.

A solution is a uniform mixture of a solute (usually a solid) dissolved in a solvent (usually a liquid) of evidence. The type of solution is determined by the state of matter of the solvent.

Endothermic reactions absorb energy from the surroundings. Exothermic reactions release energy.

You can identify substances by their solubility.

Temperature affects the properties and behaviour of materials.

Salt lowers the freezing point of water.

Water is a 'universal solvent'.

The Earth is made up of the crust, asthenosphere, mantle and inner and outer cores.

The Earth's crust is made up of interconnected tectonic plates that move around on the surface of the planet.

Silt, sand, loam, clay and chalk are ways to describe different soils.

**People of interest – Alfred Wegener (continental drift); Margaret Thatcher (chemist – Mr Whippy)**



### The Human Body

#### Core knowledge

Diet, exercise, drugs and lifestyle choices can all impact on how our bodies function.

Nutrients and water are transported through the body through blood.

The main parts of the human circulatory system are the lungs, heart, veins and arteries. They each have specific functions.

The heart pumps the blood around the body.

Veins transport blood to the heart.

Arteries transport blood away from the heart.

**Person of interest – William Thornton Mustard (mustard cardiovascular procedure); William Harvey (systemic circulation)**



conditions for organisms to survive.

Living things can be classified into 1 of 5 kingdoms. Each kingdom has unique characteristics.

Plants can be classed as flowering and non-flowering.

Pollination is needed to create more plants. Bees are an example of pollinators.

Decomposers recycle dead plants and animals into chemical nutrients that are released back into the soil.

Food chains differ in different ecological habitats.

Adaptation may lead to evolution.

Living things produce offspring of the same kind, but they are not identical to their parents.

Charles Darwin and Alfred Wallace researched the theory of evolution. They also found evidence of natural selection.

Fossils provide information about evolution over time.

**Person of interest – Charles Darwin and Alfred Wallace (theory of evolution); Mary Anning (palaeontologist)**



### Light

#### Core knowledge

Light appears to travel in straight lines.

Explain how objects are seen.

Shadows have the same shape as the object because light travels straight.

Light is made up of different colours, which can be seen when refraction occurs.

**Person of interest – Isaac Newton (prism colour separation)**



#### Working scientifically (throughout the term)

Explain and use a diagram to show the life cycle of different living things (mammals, amphibians, insects and birds).

Critically examine your results and findings to identify whether you did or did not prove the prediction.

Explain whether the results are valid, and why.

<p>Define questions to investigate.          Control variables in their own investigation.          Suggest equipment and method.          Make and justify a prediction.          Plan entire investigations and suggest risks and safety.          Use recognised symbols when representing a simple circuit in a diagram.          Suggest contexts where electrical science and circuits are applied today and explain how they work.</p>	<p><b><u>Working scientifically (throughout the term)</u></b></p> <p>Specifically identify the variables.          Graphing and tabulating data.          Begin to apply the terms solute, solvent, solution and saturation to the world around them.          Spot patterns, draw and explain conclusions.          Make accurate judgements about the accuracy and reliability of experimental data.          Identify and classify materials.          Test a range of separation techniques.</p>	 <p>Record data and explain what the data 'appears' to suggest.          Identify problems with the experimental design and suggest how to improve them next time.          Using previously found data, design a scientific model to test an idea or observation further.          Use a range of classification trees.          Use scientific equipment, such as mini bioreactor.          Undertake an experiment over an extended period of time, and assess the effectiveness of the design.          Create detailed food chains.</p>
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