

Year Group 6

Term 1

Living things and their habitats



Living things and their habitats



Evolution and Inheritance



Light

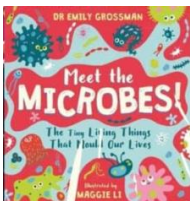


Electricity



Animals including Humans



Enquiry Question	How are living things grouped?		
Scientific Enquiry	<ul style="list-style-type: none"> To be able to record data using scientific diagrams and labels and classification keys. To be able to plan different types of scientific enquiry to answer questions. To be able to identify scientific evidence that has been used to support or refute ideas or arguments. 		
NC Objectives	<ul style="list-style-type: none"> Describe how living things are classified into broad groups according to common observable characteristic and based on similarities and differences, including micro-organisms, plants, and animals. Give reasons for classifying plants and animals based on specific characteristic. 		
Curriculum Coherence	Prior Knowledge <ul style="list-style-type: none"> Recognise that living things can be grouped in a variety of ways. Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird. 		Future Learning Links to KS3 Biology Units.
	Vocabulary Classification, microorganism, habitat, living organism, species, microscopic, ecosystem, kingdom, Linnaean system, cell.	High Quality Text 	Misconceptions All living things can be easily classified into two groups – plants and animals Once a living thing is classified, this will not change

Year Group 6

Term 1

Living things and their habitats



Living things and their habitats



Evolution and Inheritance



Light



Electricity



Animals including Humans



Unit Summary: Building on previous 'Living Things' units, this Year 6 National Curriculum course helps children identify the kingdoms of life and to classify living things within those kingdoms. The children will be introduced to the Linnean system of classification and will be able to develop their practical scientific skills through investigating mould growth on bread and mushroom spore dispersal.

Knowledge Sequence	<p>Lesson 1 – What is the classification system and why do we use it?</p> <p>During the lesson the children will recap of what classification is and why it is important that scientists classify living organisms. The children will be reminded that several factors - including habitat, physical and behavioural characteristics and reproductive strategies - influence how an organism is classified. Children will then consider the different questions they can ask to classify and categorise the animals. DE Lesson 1</p>
	<p>Lesson 2 – What did Carl Linnaean discover and why is it important?</p> <p>Within this lesson the children will discuss the theories of the Swedish scientist Carl Linnaeus, who developed a system to help classify living things. Discuss why this is important. Why do we need to know the names of things? As a class, work through the different levels in the system to help identify an animal and find its scientific name. DE lesson 2</p>
	<p>Lesson 3 – How can we observe specific characteristics in a range of creatures?</p> <p>During this lesson the focus shifts to start by following on from work completed in earlier years by recalling how living things can be grouped under the 'Mrs Gren' acronym. Explain how all living things use these processes to be alive and that it is because they do these things that we know they are a living organism. When exploring this theory, use a plant (like a daffodil) in your classroom to demonstrate what each part of the plant does. DE lesson 3</p>
	<p>Lesson 4 – How do we classify and describe different a living organism?</p> <p>The children will describe the processes which enable something to be classified as a living organism - MRS GREN. Recap the kingdoms which help us understand and classify living organisms. Discuss why the Linnaean system helps to name and classify species and remind the children of some of the predictions they have made and the experiments conducted. What did they learn from these? DE Lesson 4</p>
	<p>Lesson 5 – What are vertebrates and invertebrates an how do they differ?</p> <p>Next up the children begin to will discover that the process of condensation is when a gas is cooled. During condensation, the gas changes state to a liquid. This can be seen when water vapour comes into contact with a cool glass and liquid water droplets. The process of evaporation occurs when a liquid is heated and changes state into a gas. Encourage the children to think of examples where they have seen condensation and evaporation.</p>
	<p>Lesson 6 – How can we classify microorganisms?</p> <p>During this final lesson, the children will challenge the typical association of microbes with disease. Microorganisms which cause disease are called pathogens. The lesson will help explain that microorganisms can be grouped depending on their characteristics and that they can be both helpful and harmful. DE Lesson 6</p>
Aspiration	Your key knowledge will help you to be one of the following: Animal Care worker, Animal technician, Assistance do trainer, Beekeeper, Biologist.
Scientist/Historical figure	Carl Linnaean - KS2 Science: The work of Carl Linnaeus - BBC Teach – Developed the taxonomy for classifying organisms.

Year Group 6

Term 2

Evolution and Inheritance



Living things and their habitats



Evolution and Inheritance



Light

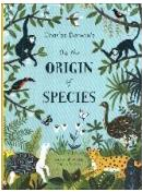


Electricity



Animals including Humans



Enquiry Question	How do living things adapt to their environment?		
Scientific Enquiry	<ul style="list-style-type: none"> To be able to record data using scientific diagrams and labels and classification keys To be able to plan different types of scientific enquiry to answer questions. To be able to identify scientific evidence that has been used to support or refute ideas or arguments. 		
NC Objectives	<ul style="list-style-type: none"> Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago. Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents. Identify how animals and plants adapt to suit their environment in different ways and that adaptation may lead to evolution. 		
Curriculum Coherence	Prior Knowledge: Identify that humans and some other animals have skeletons and muscles for support, protection and movement Recognise that living things can be grouped in a variety of ways		Future Learning Links to KS3 Biology Units.
	Vocabulary Electricity, batteries, circuits, voltage, current, bulb, conductor, insulator, switch, control, wind turbines, hydropower.	High Quality Text 	Misconceptions Evolution is a process of gradual change: Environmental change can be inherited, e.g. if a dog loses a limb, its puppies will be born missing a limb

Year Group 6

Term 2

Evolution and Inheritance



Living things and their habitats



Evolution and Inheritance



Light



Electricity



Animals including Humans



Unit Summary: This unit introduces the children to the key concepts of evolution and inheritance by building upon previous topics, including animal characteristics and fossils. The children will learn about inherited traits and apply their knowledge to various animals and plants, before being introduced to the work of Mary Anning and Charles Darwin. Through the presentations and tasks, the children will learn about the fascinating history of the human race and discover links between extinct animals and those which are still living today.

Knowledge Sequence	<p>Lesson 1 – What makes us different? This lesson explains how offspring inherit different characteristics from their parents and this produces variations in animals. The children will examine the offspring produced from both same breed dogs and cross breed dogs. In both cases, the children will begin to understand that there is always some variation between parents and their offspring. The children will also be given the opportunity to think about the ways in which environmental factors might bring about variation in species. DE Lesson 1</p>
	<p>Lesson 2 – Why does the environment change and how do we keep up? Within this lesson recap on the children’s learning from the previous lesson. This also an opportunity to enable the children to think back to their learning in Year 4, which looked at adaptations in animals. The lesson recaps on the different habitats around the world. It expands on knowledge first introduced in Year 4, around the adaptation of the camel to suit its environment. DE lesson 2</p>
	<p>Lesson 3 – Why is evolution important for survival? During this lesson the focus shifts to look at what makes Earth the perfect environment to make it habitable for humans and other animals. The children will explore the different eras and how some animals have been able to survive for millions of years, others have not. The children will discover the work and life of Mary Anning, the famous palaeontologist. In the presentation, the children will find out some of the most important fossils that she discovered. They will then be able to compare these findings to living creatures we see today. DE lesson 3</p>
	<p>Lesson 4 – What characteristics do we need to survive? This lesson progresses the children’s learning to consider the conditions that exist in the desert and the adaptations of animals that live there. For example, the sand cat is an animal that lives in the desert and has several adaptations. E.g. the hairy foot protects against hot and cold temperatures, their sandy colour helps protect them from predators. The children then start to explore how plants have adapted to survive. DE Lesson 4</p>
	<p>Lesson 5 – What did Darwin find and how do we know it is true? Explore the term natural selection, which was the term Charles Darwin chose to describe the process in which living things adapt to their habitat. He put forward the idea that the living things which hadn’t been able to adapt were the ones that went extinct. Discuss some examples of animals which are now extinct; for example, scientists believe woolly mammoths became extinct around 4,000 years ago due to climate change and lack of food. This is an example of an animal which was driven to extinction by environmental factors, rather than human activity. DE Lesson 5</p>
	<p>Lesson 6 – How have Humans evolved over time? During this final lesson, the children explore human evolution. Following the extinction of the dinosaurs, new species of mammals were able to evolve. The first ever primate appeared around 55 million years ago. This primate slowly evolved to homo sapiens, present day humans. Discuss differences in skulls, how this links to brain capacity and how they evolved to use tools. DE Lesson 6</p>
Aspiration	Your key knowledge will help you to be one of the following: Archaeologist, palaeontologist
Scientist/Historical figure	Mary Anning and Charles Darwin

Year Group 6

Term 3

Electricity



Living things and their habitats



Evolution and Inheritance



Light

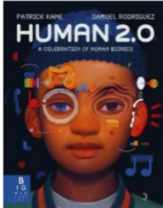


Electricity



Animals including Humans



Enquiry Question	How many men did it take to invent the lightbulb?		
Scientific Enquiry	<ul style="list-style-type: none"> To be able to plan different scientific enquiry to answer questions. To be able to record data using scientific diagrams To be able to report and present findings from enquiries, including conclusions, casual relationships, and explanations of and degree of trust in results, in oral and written forms. 		
NC Objectives	<ul style="list-style-type: none"> To recognise and use symbols in a circuit diagram. To compare and give reasons for variations in how components function including: the brightness of bulbs, volume of buzzers and switches. To associate the brightness of a lamp or buzzer with the number and voltage of the cells, used in a circuit. 		
Curriculum Coherence	<p>Prior Knowledge</p> <ul style="list-style-type: none"> Electrical conductors allow electricity to flow through them and materials that don't are called insulators. Simple electrical components such as cells, wires, bulbs, switches and buzzers and know that they can be used to present a simple circuit diagram. 	<p>Future Learning</p> <p>Links to KS3 Physics Units.</p>	
	<p>Vocabulary</p> <p>Circuit, battery, electricity, resistor, variable resistor, switch, output, systematically, synchronised, signal, conductor, insulator.</p>	<p>High Quality Text</p> 	<p>Misconceptions</p> <p>The size of a battery will affect the brightness of a bulb:</p> <p>All metals conduct electricity equally</p>

Year Group 6

Term 3

Electricity



Living things and their habitats



Evolution and Inheritance



Light



Electricity



Animals including Humans



Unit Summary: This unit 'Electricity' takes children through six lessons where they learn how to: **associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit;** they learn how to **compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches;** and finally, they use **recognised symbols when representing a simple circuit in a diagram.**

Knowledge Sequence	<p>Lesson 1 – What conventional circuit symbols represents different components within a circuit? Start by revising components from Year 4 - cells, wires, bulbs, switches and buzzers. The children will learn about the appearance and function of different electrical components, including switches, bulbs, buzzers, batteries/cells, motors and wires. Provide the children with the equipment needed to create the displayed series circuit (bulb, battery, wires and switch). Identify how to accurately draw a circuit diagram. DE Lesson 1</p>
	<p>Lesson 2 – What impact does voltage have on the brightness and volume of a bulb? Within this lesson The children discover how a battery produces electricity and that the rate of electricity following through a circuit is the current. They learn about voltage (V) and that connecting cells in a battery adds their voltages together. Voltage can be measured using a voltmeter which is connected in parallel. Ask them to create several electrical circuits with different numbers of bulbs and predict whether the bulb will be brighter than the control. Measure and record the voltmeter readings and link the voltmeter readings to the number of cells and brightness of the bulb in the circuit. DE lesson 2</p>
	<p>Lesson 3 – What factors can influence how complete a circuit is? During this lesson the children will build on the children's understanding of voltage, use the presentation to explain that bulbs have a V on them to indicate how much voltage it can handle. Provide the children with the opportunity to look closely at different bulbs. Explore the uses and importance of resistors and variable resistors. The children will work in pairs to create 'deliberately broken' circuits. This could be because the voltage is too high or low, the circuit is incomplete or there are too many components. DE lesson 3</p>
	<p>Lesson 4 – What is the effect of adding more components to a circuit with only one cell? This lesson will expect the children will plan an investigation to find out 'how the number of components in a circuit affects the output.' Discuss ideas for possible variables the children could test and explore how to set up a fair test and use a control. Encourage the class to test a variety of variables to discuss after the investigation. DE Lesson 4</p>
	<p>Lesson 5 – What effect does have multiple cells have on how many competes can be added to a circuit? This lesson explores the idea of how traffic lights are central to road safety as they control the flow of traffic and allow pedestrians to cross the road. Explore what each colour of traffic light means. The children will learn that timers provide a signal to change the colour of the traffic lights. Get the children to think about how they could possibly get only one bulb within a circuit to illuminate.DE Lesson 5</p>
	<p>Lesson 6 – What is the importance of conductors and insulators in our homes? During this final lesson the children to explore some games that use electric circuits and discuss how they work. Explain how a wire loop game works. Recap learning from Years 4 & 5 to discuss materials that are conductors and insulators. Reinforce the idea that the handle should be wrapped in an insulator to keep the children safe but the end of the hook needs to be a conductor to complete the circuit. Contact with the wire loop will close the circuit, switching the bulb and buzzer on. DE Lesson 6</p>
Aspiration	Your key knowledge will help you to be one of the following: Electrician, Product designer, Operations manager, Mechanic, Solar farm manager, Engineer.
Scientist/Historical figure	Mildred S Dresselhaus - Research cards: electricity - The Ogden Trust – helped to invent the rechargeable batteries used today in modern equipment.

Year Group 6

Term 4

Light



Living things and their habitats



Evolution and Inheritance



Light

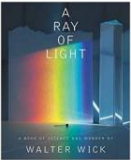


Electricity



Animals including Humans



Enquiry Question	Why do we need eyes to see?		
Scientific Enquiry	<ul style="list-style-type: none"> To be able to plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary. To be able to take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate. To be able to record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar, and line graphs. 		
NC Objectives	<ul style="list-style-type: none"> Recognise that light appears to travel in straight lines. Know that light travels in straight lines to explain that objects are seen because they give out reflect light into our eyes. Explain that we see things because light sources to our eyes or from light sources to objects and then to our eyes. Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them. 		
Curriculum Coherence	<p>Prior Knowledge</p> <ul style="list-style-type: none"> We need light in order to see things in that dark is the absence of light. Light is a form of energy and come from different sources. Light is reflected off surfaces. Shadows are formed when light is blocked. 	<p>Future Learning</p> <p>Links to KS3 Physics Units.</p>	
	<p>Vocabulary</p> <p>Light, source, reflected, variable, angle, mirror, opaque, transparent, sunshade, rotate, optical, spectrum.</p>	<p>High Quality Text</p> 	<p>Misconceptions</p> <p>Light travels from our eyes to an object, allowing us to see it.</p> <p>Light travels instantaneously.</p>

Year Group 6

Term 4

Light



Living things and their habitats



Evolution and Inheritance



Light



Electricity



Animals including Humans



Unit Summary: This unit 'Light' takes children through six lessons where they learn how to: **recognise that light appears to travel in straight lines; use the idea that light travels in straight lines to explain that 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;** and finally, children learn how to **use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.**

Knowledge Sequence

Lesson 1 – How does light travel and how do we know?

Start by recapping on the children's learning on the light unit covered in Year 3. The children have previously learnt how to recognise that they need light in order to see things and that dark is the absence of light. They have also learnt how to notice that light is reflected from surfaces. The children will carry out a mini experiment to find out that light travels in straight lines from a light source to our eyes so that we can see. [DE Lesson 1](#)

Lesson 2 – How does light travel to the eyes?

Within this lesson the children will start to understand that light travels through space as a form of electromagnetic radiation, moving at a constant speed of approximately 299,792,458 meters per second. It can be refracted, reflected, and absorbed as it encounters different media and surfaces, and its wavelength determines its colour. [DE lesson 2](#)

Lesson 3 – What impact does reflection have on helping us to see?

In this lesson, the children will explore that reflection plays a critical role in how we see the world around us. When light reflects off an object, some of that light enters our eyes, where it is focused onto the retina by the cornea and lens. The retina contains photoreceptor cells that convert the light into electrical signals, which are then sent to the brain for processing. Without reflection, we would not be able to see anything. The children will attempt to make a periscope to explore how reflection can help us to see different objects. [DE lesson 3](#)

Lesson 4 – Do shadows have the same shapes as the object that cast them?

This lesson starts by ensuring the children have the key knowledge relating to light: The fact that shadows have the same shape as the object that casts them is due to the way that light travels in straight lines. When light encounters an object, it is either absorbed, transmitted, or reflected. If the object is opaque and reflects some of the light, it will create a shadow behind it where the light cannot reach. The shape of the shadow is determined by the outline of the object, since light cannot bend around corners. The children will replicate this through an experiment and observe their findings. [DE Lesson 4](#)

Lesson 5 – Why do we have rainbows?

In this lesson, the children will begin by discussing the sun and the essential role it plays for life on Earth. The sun's energy sustains all life on Earth; without it, there would be no light, plants or animals. It would be completely dark on Earth and all the water would cool down and freeze. The children may also discuss how rain and wind patterns would be different without the sun, since the sun causes evaporation of water molecules from oceans and rivers. The children will then conduct 4 experiments which will mirror the effects of a rainbow and allow scientific discussions around this. [DE Lesson 5](#)

Aspiration

Your key knowledge will help you to be one of the following: Optometrist, film production, doctor, sunglasses producer/designer.

Scientist

Ibn al-Haytham (Alhazen) [KS2 Science: The work of the 'father of optics' Alhazen - BBC Teach](#)– Physicist who developed the theory that light travels in straight lines and explored it through different experiments.

Year Group 6

Term 5 & 6

Animals including Humans



Living things and their habitats



Evolution and Inheritance



Light

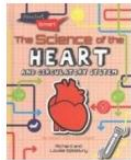


Electricity



Animals including Humans



Enquiry Question	What is the cost of being heartless?			
Scientific Enquiry	<ul style="list-style-type: none"> Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar, and line graphs. Identifying scientific evidence that has been used to support or refute ideas or arguments. Reporting and presenting findings from enquiries, including conclusions, casual relationships, and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations. 			
NC Objectives	<ul style="list-style-type: none"> Identify and name the main parts of the human circulatory system and describe the functions of the heart, blood vessels and blood Recognise the impact of diet, exercise, drugs, and lifestyle on the way their body's function. Describe the ways in which nutrients and water are transported within animals, including humans. 			
Curriculum Coherence	Prior Knowledge <ul style="list-style-type: none"> Identify and label the basic parts of the human body (Y1). Describe the importance for humans to eat healthy, exercise and good hygiene (Y2). Identify that humans have skeletons and muscles (Y3). Describe the basic functions of the digestive system and the different types of teeth (Y4). Describe the changes in humans from birth to old age (Y5). 		Future Learning Links to KS3 Biology Units.	
	Vocabulary Circulatory system, BMP, diet, pulse, oxygenated, deoxygenated, atrium, ventricle, vessel, valve, diffusion, osmosis.	High Quality Text 	Misconceptions	Assessment/outcomes Retrieval Practice Written Task Online Platform

Year Group 6

Term 5 & 6

Animals including Humans



Living things and their habitats



Evolution and Inheritance



Light



Electricity



Animals including Humans



Unit Summary: 'Animals, including humans' takes children through six lessons where they learn how to: **identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood; recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function;** and finally, they learn how to **describe the ways in which nutrients and water are transported within animals, including humans.**

Knowledge Sequence	<p>Lesson 1 – How does the heart keep us alive? During the lesson the children explore the circulatory system and the heart. Discuss whether the heart works on its own or if it is part of a system. The children will learn that the heart consists of 4 key structures: 2 atria and 2 ventricles. The atria contract to draw blood into the ventricles (either from the lungs or the body). Then, the ventricles contract to squeeze the blood upwards and out of the heart. The children learn which vessels carry the blood to and from the heart and how valves keep the oxygenated and deoxygenated blood separate. Children to then explore a pigs heart with the support of the local butches surgery. DE Lesson 1</p>
	<p>Lesson 2 – What role does the circulatory system play in keeping us alive? This objective will be split over 2 lessons firstly, looking at the role the different blood vessels and capillaries play and secondly the role of the blood. The children will learn that there are 3 types of blood vessels. Arteries take blood away from the heart; they have thick, muscular walls and a small space for the blood to flow. Veins bring blood back to the heart, they have thinner walls and a larger space for blood to flow. Capillaries are microscopic and connect the arteries and veins. They are very small and so they can reach all parts of the body. DE lesson 2 The children will discover the different components of blood. They will learn that red blood cells carry oxygen, white blood cells fight infection as part of the immune system, platelets help to clot (thicken) the blood and form a scab and that plasma is the fluid part of the blood in which these components are suspended. The children will describe the functions of red blood cells, white blood cells, platelets and plasma and create a pie chart showing the percentage of each component by volume in a typical sample of blood. DE lesson 3</p>
	<p>Lesson 4 – What impacts our heart rate? During this lesson the children will Ask the children to design and conduct an investigation of their choosing associated with heart rate, diet and exercise. They should pose their own questions and plan the investigation to answer it, identifying their variable, control variables, prediction and method. Questions that they might explore are: What effect do different types of exercise have on my heart rate? What effect does time spent exercising have on my heart rate? How long does it take for my heart rate to return to resting following the different exercises? What impact does food have on my performance in exercise? DE lesson 4</p>
	<p>Lesson 5 – What is harmful to our bodies? This lesson progresses the children’s learning by learning that other lifestyle factors can also affect health, such as drugs and alcohol. They will learn that drugs can be used for medical or recreational purposes. Explore some drugs and their uses with the children. Explore how drugs can be classified into 4 groups: painkillers, stimulants, depressants and hallucinogens. The children will learn the negative effects of the 4 types of recreational drugs - including alcohol - such as liver damage, poor sleep, high cost, high blood pressure and different types of cancer. DE Lesson 5</p>
	<p>Lesson 6 – What does research tell us about how to maintain a healthy lifestyle? This lesson allows the children to link their learning from their PSHE lessons and consider what are the requirements for a healthy lifestyle. We will explore the inhibiting factors to this and what is needed to maintain this.</p>
	<p>Lesson 7 – Why do we need water and food and how is it transported around the body? During this final lesson in the sequence, the children should recall that nutrients come from the food we eat and that the food gets broken down by our digestive system; this recaps work from Year 4. The children learn that the nutrients must be absorbed into the blood. They learn that this happens by processes called diffusion and osmosis. DE Lesson 7</p>
	Aspiration
Scientist/Historical figure	Richard Doll – Epidemiologist - Sir Richard Doll Health The Guardian