

Cheadle Primary – the school at the heart of the village, free to flourish, ready to learn and succeed. Progression of Skills and Knowledge: SCIENCE Year 6

	Autumn 1 WW2	Autumn 2 WW2	Spring 1 Mountains	Spring 2/Summer 1 South America	Summer 1 Britain Since 1066	Summer 2 Britain Since 1066
Topic	Electricity	Living things-Microorganisms and Classification	Light and sight	Evolution and Inheritance	Animals inc. Humans, diet and exercise and Sex Education.	Famous Scientists
Scientific enquiry and questioning.	To associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit. 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	To describe how things are classified into broad groups according to common observable characteristics and similarities and differences including microorganisms, plants and animals. To give reasons for classifying plants and animals	To recognise that light appears to travel in straight lines. Use the fact that light travels in straight lines to explain why shadows have the same shape as the objects that cast them. Use the fact that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye	To 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 are adapted to suit their environment in different ways and that adaptation may lead to evolution	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. Describe the way in which nutrients and water are transported within animals including humans. SRE planning	To understand how men and women have changed our understanding of science. To look closely at the lives of famous scientists such as; Stephen Hawking, Alexander Fleming, Libbie Hyman, Marie Maynard Daly and Mary Leakey and Steve Jobs.
Observing	Observe and explain the effects of differing volts in a circuit. Observe how the brightness/ volume of a buzzer and bulb is affected by the thickness of wires/ number of cells/ type of circuit	Predict, observe and explain the changes over time of decaying food in differing environments and in different conditions.	Observe and explain what happens when a light source is close/far from an object. Observe what happens with coloured foil over light sources. Observe and explain refraction. observe what happens when light is directed at a prism		Observe the effects of exercise on the circulatory system	To use recognised symbols when representing a simple circuit in a diagram in the context of the invention of Apple computers and the life of Steve Jobs.
Identifying, and classifying		Classify animals into the 5 animals classes Classify vertebrates/ invertebrates Classify plant life Describe and investigate helpful and harmful microorganisms. Identify the characteristics of different types of microorganisms. Classify organisms found in my local habitat. Explain the classification of organisms found in my local habitat.		Identify the key ideas of the theory of evolution Identify evidence for evolution from fossil records Identify how plants/animals have adapted to their environments identifying hereditary and adaptive traits	Identify and name the parts of the human circulatory system Revise the parts and features of the digestive system Identify the main parts of the heart Recognise the impacts of drugs, diet and exercise on the hear Identify harmful and helpful drugs Identify how water and nutrients are transported Identify the functions of blood Recognise the positive impact of exercise	
Testing, reporting and Finding	Plan an investigation. Understand variations in how components function. Conduct an investigation. Record data and report findings. Investigate results further.	Describe and investigate helpful and harmful micro organisms. Record and use identification keys	Investigate how refraction changes the direction in which light travels. Investigate how a prism changes a ray of light. Investigate how light enables us to see colours.	Find examples of adaptive traits Study fossils to study evolution and adaptation. Find examples of how animals have adapted to their environment. Analyse the advantages and disadvantages of specific adaptations	Plan a scientific enquiry Record, report and present results appropriately. Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate	To recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago in the context of Mary Leakey’s fossil findings in the Olduvai Gorge. To report and present findings from enquiries, including causal relationships, in oral and written forms such as displays and other presentations in the context of Stephen Hawking and his findings on black holes. To record data using scatter graphs in the context of Fleming’s discovery of penicillin.
Key Questions	What is current electricity? Why do light bulbs or buzzers perform differently when more or less cells are used? What will make a buzzer/bulb louder or brighter? What will make a buzzer/bulb quieter or dimmer?	What are the characteristics of the 5 main animal groups? How do keys work to classify animals? How can plant life be classified? What is a microorganism? How do we classify microorganisms? What is cold blooded/ warm blooded?	How do we know that light travels in straight lines? How do we see objects? Why are shadows the same shape as the objects that cast them? Why do shadows appear elongated or shortened? What happens when light hits a prism? Why do objects in water appear bent?	What evidence do we have of evolution and inheritance? What are adaptive and inherited traits? How have animals and plants adapted to their environment? What are the different types of fossils and what do they tell us?	What are the main parts of the circulatory system and how does it work? What is the function of the blood and the heart? How are nutrients transported to the body? What are the impact of drugs on the body? What is the impact of exercise on the body?	Can you investigate the life and work of a famous scientist? Who was Steve jobs, Dr Daniel Hale Williams, Mary Leakey, Alexander Flemming, Libby Hyman, Stephen Hawking and Marie Daly
Key Learning Intentions.	To explain the importance of the major discoveries in electricity. To be able to observe and explain the effects of differing volts in a circuit.	To be able to describe the features of the 5 main animal groups To be able to give reasons for classifying animals based on similarities and differences.	To be able to explain that light travels in straight lines from light sources to our eyes, and from light sources to objects and then to our eyes.	To explain the scientific concept of inheritance. To demonstrate understanding of the scientific meaning of adaptation	To identify and name the parts of the human circulatory system To describe the functions of the main parts of the circulatory system	To report on my findings from an enquiry inspired by Stephen Hawking’s theories about black holes. To use Libbie Hyman’s work to classify invertebrates.

	<p>To understand the difference in a series and parallel circuit. To be able to plan and conduct an investigation. To be able to understand variations in how components function.</p> <p>To be able to record my data and report my findings. To be able to investigate my results further.</p>	<p>To be able to describe how living things are classified into groups. To be able to identify the characteristics of different types of animals. To be able to classify a creature based on its characteristics. To be able to describe and investigate helpful and harmful microorganisms. To be able to identify the characteristics of different types of microorganisms. To be able to classify organisms found in my local habitat. To be able to explain the classification of organisms found in my local habitat.</p>	<p>To understand how mirrors reflect light, and how they can help us see objects. To investigate how refraction changes the direction in which light travels. To be able to investigate how a prism changes a ray of light. To know how light enables us to see colours. To be able to explain why shadows have the same shape as the object that casts them. To be able to explain why shadows appear elongated or shortened.</p>	<p>To identify the key ideas of the theory of evolution To identify evidence for evolution from fossil records To understand how human beings have evolved To explain how adaptations can result in both advantages and disadvantages To know the difference between adaptive and in hereditary adaptation To understand DNA To explain how human intervention affects evolution</p>	<p>To explain how water and nutrients are transported within the body To describe how diet and exercise impact on human bodies To plan a scientific enquiry To record, report and present results appropriately To explain the impact of drugs and alcohol on the body To describe how scientific evidence highlighted the dangers of smoking</p>	<p>To identify the evidence scientists used to prove the structure of DNA To record and interpret data on the effects of penicillin using a scatter graph To describe the importance of the fossils found by Mary Leakey To explain how Steve Jobs used electronics to design computers To explain how diet affects the way the body functions in the context of Marie Daly. To label the parts and functions of the heart. To explain Dr Daniel Hale Williams' accomplishments</p>
Key Knowledge National Curriculum.	<p>Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit.</p> <p>Compare and give reasons for variations in how components function.</p> <p>Use recognised symbols when representing a simple circuit in a diagram.</p>	<p>Describe how things are classified into broad groups according to the common observable characteristics and based on similarities and differences, including plants, animals and microorganisms.</p> <p>Give reasons for classifying plants and animals based on specific characteristics.</p> <p>To know the difference between helpful and harmful bacteria</p>	<p>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. Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them. Know that light is made from a spectrum of colours</p>	<p>Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago.</p> <p>Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents.</p> <p>Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.</p>	<p>Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood.</p> <p>Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function.</p> <p>Describe the way in which nutrients and water are transported within animals including humans.</p>	<p>Not applicable as this is a non-statutory unit of work.</p>
Key vocabulary.	<p>voltage, brightness, volume, switches - on/off, danger, series circuit, parallel circuit, circuit diagram, bulb, buzzer, motor and recognised symbols.</p>	<p>Classification, taxonomist, warm/cold blooded, key ,Virus, Fungi, Microbe, Disease, Decay, Decompose, Microorganisms, Bacteria, Yeast, Germ, Mould, Reproduce and Vaccination.</p>	<p>object, shadows, mirrors, periscope, rainbow, filters, light source, reflect, reflection, refraction, incident ray, prism, straight, spectrum, travels , opaque, transparent, translucent and light.</p>	<p>living things, change, fossils, offspring, vary, not identical, characteristics, variation, adapt, environment,extreme, conditions, advantages, disadvantages, evolution, adaptation, inheritance, and inherit.</p>	<p>Internal organs, heart, liver, lungs, kidneys, brain, skeleton, muscle, digest, blood vessels, impact, diet, exercise,drugs, lifestyle, nutrients,water, damage, alcohol, substances and circulatory system.</p>	<p>black holes, fossils, invertebrates, penicillin, DNA, inheritance, structure,</p>
Key challenge.	<p>What is the difference in a parallel and series circuit?</p>	<p>What is a taxonomist? Research unfamiliar animals and plants from a broad range of habitats and decide where they belong.</p>	<p>Why do objects appear bent in water?</p>	<p>Who was Charles Darwin?</p>		
Resources	<p>Wires, bulbs, buzzers, batteries, circuit breakers</p>		<p>torches, prisms, batteries, coloured films, lenses, opaque objects, paper,</p>		<p>stopwatches</p>	<p>Tin foil sheets, Pins,Sheets of stretchy fabric (tubular bandages cut open on one side and straightened out work well) Marbles, Heavy balls (boules ball is ideal), Balloon pump, glue scissors</p>