Science Year 6 Long Term Plan						
Themes (Number of weeks/Term)	**Autumn 1** **Living things and their habitats** **(8 weeks)**	**Autumn 2** **Electricity** **Sustainability** **(7 weeks)**	**Spring 1** **Light** **Sustainability** **(5 weeks)**	**Spring 2** **Animals, including humans** **(7 weeks)**	**Summer 1** **Evolution and inheritance** **(6 weeks)**	**Summer 2** **Evolution and inheritance** **(6 weeks)**
NC Content/Coverage	**Biology** **Unit 1:** Living things and their habitats	**Physics** **Unit 2:** Electricity **Unit 3**: Renewable energy	**Physics** **Unit 4:** Light **Unit 5:** Light pollution	**Biology** **Unit 6:** The circulatory system **Unit 7**: Diet, drugs and lifestyle	**Biology** **Unit 8:** Variation **Unit 9**: Adaptations	**Biology** **Unit 10:** Fossils
Substantive knowledge teaching sequence	• I can explain the differences between living and non-living things. • I can group animals and plants based on their features. • I can explain what classification keys are and can classify plants. • I can explain what microorganisms are and I can classify them.	• I can explain what a series circuit is, draw circuit symbols and explain what a complete/incomplete circuit is. • I can explain why the brightness of a bulb and the loudness of a buzzer decrease when more components are added to the circuit. • I can plan an experiment and investigate how the voltage in a circuit affects the loudness of a buzzer. • I can evaluate the findings of my experiment. • I can explain what the advantages and disadvantages of non-renewable energy are and	• I can explain how we see and how light travels. • I can explain what a shadow is and what causes them to form. • I can plan an experiment, investigate how the distance from a light source affects the size of a shadow and evaluate my findings. • I can explain what refraction and white light are. • I can explain what light pollution is and explain ways in which we can reduce light pollution.	• I can explain what the circulatory system is and what it is made up of. (Labelled diagram) • I can explain what blood is made of. • I can explain what the function of the heart is. • I can explain how blood flows around the body. • I can explain the difference between oxygenated and deoxygenated blood. • `I can identify the five food groups and their impact on the body. • I can identify different types of drugs and their effect(s) on the body. • I can explain the effects of smoking and vaping on the body. • I can plan, investigate and evaluate an experiment to explore how the duration of	• I can explain what the terms ‘variation’ and ‘inheritance’ mean. • I can explain how some animals have adapted to meet the needs of their environment. • I can explain how some plants have adapted to meet the needs of their environment. • I can explain what evolution is. • I can explain who Charles Darwin was and why his work in the Galapagos Islands was so important. • I can explain what ‘natural selection’ is.	• I can explain what fossils are and how they are formed. • I can investigate how fossils have changed over time and how it provides evidence for evolution. • I can explain who Mary Anning was and what she discovered.

		explain the impact renewable and non-renewable energy sources are having on the environment.		exercise affects heart rate.		
Disciplinary knowledge/Working Scientifically	**Answer questions and make conclusions** I know how to use scientific evidence to answer questions. I know how to make conclusions based on scientific evidence and from my own testing and findings. I know how to identify scientific evidence that has been used to support or refute ideas or arguments. **Gather, record and classify data** I know how to record data and results of increasing complexity using scientific diagrams and labels and classification keys. **Present findings** I know how to report and present findings from enquiries, including conclusions, causal relationships and explanations and explanations of and a degree of trust in results, in oral and written forms	**Gather, record and classify data** I know how to record data and results of increasing complexity using scientific diagrams and labels. **Planning** I know how to make predictions based on scientific knowledge. I know how to plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary. I can plan an experiment and investigate how the voltage in a circuit affects the loudness of a buzzer. **Evaluate** I can evaluate the findings of my experiment about voltage in a circuit. I know how to use test results to make predictions to set up further comparative and fair tests. I know how to suggest investigation	**Answer questions and make conclusions** I know how to use scientific evidence to answer questions. I know how to make conclusions based on scientific evidence and from my own testing and findings. I know how to identify scientific evidence that has been used to support or refute ideas or arguments. **Gather, record and classify data** I know how to record data and results of increasing complexity using scientific diagrams and labels and tables. **Planning** I know how to make predictions based on scientific knowledge. I know how to plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.	**Asking questions** I know how to ask relevant scientific questions and choose which enquiry type would be best suited to answer them. **Answer questions and make conclusions** I know how to use scientific evidence to answer questions. I know how to make conclusions based on scientific evidence and from my own testing and findings. I know how to identify scientific evidence that has been used to support or refute ideas or arguments. **Make observations** I know how to use a range of scientific equipment to make systematic and careful observations with increased complexity. **Present findings** I know how to report and present findings from enquiries, including conclusions, causal relationships and explanations and explanations of and a degree	**Gather, record and classify data** I know how to record data and results of increasing complexity using scientific diagrams and labels. **Answer questions and make conclusions** I know how to use scientific evidence to answer questions. I know how to make conclusions based on scientific evidence and from my own testing and findings. I know how to identify scientific evidence that has been used to support or refute ideas or arguments. **Planning** I know how to make predictions based on scientific knowledge. I know how to plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.	**Answer questions and make conclusions** I know how to use scientific evidence to answer questions. I know how to make conclusions based on scientific evidence and from my own testing and findings. I know how to identify scientific evidence that has been used to support or refute ideas or arguments. **Present findings** I know how to report and present findings from enquiries, including conclusions, causal relationships and explanations and explanations of and a degree of trust in results, in oral and written forms.

	such as displays and other presentations.	improvements including accuracy of results. I know how to provide some simple examples of how to extend the investigation. **Answer questions and make conclusions** I know how to use scientific evidence to answer questions. I know how to make conclusions based on scientific evidence and from my own testing and findings. I know how to identify scientific evidence that has been used to support or refute ideas or arguments. **Present findings** I know how to report and present findings from enquiries, including conclusions, causal relationships and explanations and explanations of and a degree of trust in results, in oral and written forms.	I can plan an experiment, investigate how the distance from a light source affects the size of a shadow and evaluate my findings. **Take measurements** I know how to take measurements with increasing accuracy and precision, taking repeat readings when appropriate. **Present findings** I know how to report and present findings from enquiries, including conclusions, causal relationships and explanations and explanations of and a degree of trust in results, in oral and written forms.	of trust in results, in oral and written forms. **Planning** I know how to make predictions based on scientific knowledge. I know how to plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary. I can plan, investigate and evaluate an experiment to explore how the duration of exercise affects heart rate. **Take measurements** I know how to take measurements, using a range of scientific equipment, e.g. a stopwatch, with increasing accuracy and precision, taking repeat readings when appropriate. **Evaluate** I know how to use test results to make predictions to set up further comparative and fair tests. I know how to suggest investigation improvements including accuracy of results. I know how to provide some simple examples of how to extend the investigation.	**Present findings** I know how to report and present findings from enquiries, including conclusions, causal relationships and explanations and explanations of and a degree of trust in results, in oral and written forms.	

Key vocabulary	Organism, Living, Non-living, Vertebrate, Invertebrate, Microorganism	Series circuit, Complete circuit, Incomplete circuit, Switch, Renewable energy, non-renewable energy	Light source, Shadow, Opaque, Transparent, Translucent, Light pollution	Circulatory system, Heart, Blood vessels, Balanced diet, Drug	Organism, Variation, Inheritance, Characteristics, Adaptations, Habitat	Fossil, Rock, Palaeontologist
Additional/ Cross Curricular and continuous opportunities	The children will recap their work on microorganisms when they complete their DT topic which looks at bread. There will also be an opportunity to revisit some of the learning from this unit in their Geography units. E.g. Biomes. <u>Continuous opportunities</u> ○ Living vs Non-Living Sorting Station – real objects, photos, and cards for pupils to sort and justify decisions using life process criteria (e.g. MRS GREN). ○ Classification Table – collections of plant and animal images/specimens for grouping by shared features (e.g. vertebrate/invertebrate, leaf shape, habitat). ○ Classification Keys Workshop – ready-made and blank branching keys for pupils to practise using	This learning can also be regularly revisited when turning classroom lights on and off and taking the opportunity to remind children to turn off the lights when leaving classrooms. Regular opportunities will be taken to remind and question pupils about the role of electricity in items found around the school. <u>Continuous opportunities</u> ○ Circuit Building Station – battery holders, wires, bulbs, buzzers, switches and motors for pupils to build series circuits, test complete vs incomplete circuits and troubleshoot why some circuits don't work. ○ Circuit Symbols Mat – laminated circuit symbol cards and blank circuit maps for pupils to draw and label circuits correctly in their books or on whiteboards.	The meaning of the key vocabulary from this unit will be regularly retrieved through incidental opportunities e.g questioning related to objects in the classroom e.g. Is this book opaque or translucent? Why have I got a shadow right now? <u>Continuous opportunities</u> ○ Light Exploration Station – torches, mirrors, reflective and non-reflective surfaces for pupils to explore how light travels and how we see objects (light source → object → eyes). ○ Shadow Investigation Area – torches/lamp, rulers and a range of objects to create shadows. Pupils can move the light source closer/further away to observe and measure how shadow size changes. ○ Planning and Fair Test Station – investigation prompt cards and planning sheets to	The children will use drama activities to act out how blood travels around the body. The children will write a description of how the blood travels around the body using the passive voice, e.g. Blood is circulated around the body by the heart, which acts as a pump. The children will create a scatter diagram to display the findings from their investigation. <u>Continuous opportunities</u> ○ Circulatory System Diagram Station – labelled and unlabelled diagrams of the human circulatory system for pupils to label and annotate (heart, blood vessels, lungs). ○ Blood Components Table – information cards and simple models/diagrams showing what blood is made of (red blood cells, white blood cells, platelets, plasma) with matching activities. ○ Heart Function Model Area – simple pump	Ask pupils to recall learning from the Y3 Stone Age and explain how man has adapted since that time. Ask pupils to recall learning from the Y3 Stone Age unit to explain how fossils have helped us to understand that period. <u>Continuous opportunities</u> ○ Variation and Inheritance Sorting Station – picture cards of animals, plants and humans for pupils to sort into "inherited" and "environmental" characteristics (e.g. eye colour vs scars, leaf shape vs leaf damage). ○ Inherited Traits Matching Game – parent–offspring matching cards to show how characteristics are passed on, with discussion prompts	Ask pupils to recall learning from the Y3 Stone Age unit to explain how fossils have helped us to understand that period. <u>Continuous opportunities</u> ○ Fossil Exploration Station – real or replica fossils, images, and 3D models for pupils to examine, describe and identify features. ○ Fossil Formation Demonstration Area – sand, clay, plaster, and small objects to simulate how fossils form over time, allowing pupils to create their own "fossils." ○ Evolution Evidence Investigation Table – sets of fossil images showing changes in species over time, for pupils to compare, sequence and explain patterns. ○ Mary Anning Research Station –

	and creating their own keys to classify local plants. ○ Microorganisms Investigation Area – microscope slides/images of bacteria, fungi and protozoa (or virtual microscope resources) to explore what microorganisms are and how they're classified. ○ Fieldwork Corner – plant samples or photos from the school grounds for real-world classification practice using keys. ○ Data Recording and Evaluation Station – science journals, classification charts and reflection prompts for pupils to explain choices and evaluate how effective their keys were. ○ Challenge Cards – extension tasks (e.g. "Create a key to classify five unknown plants" or "Explain why a virus is different from other microorganisms").	○ Brightness & Loudness Investigation Area – identical bulbs/buzzers with extra components to add in series so pupils can observe and record how brightness and loudness change as more components are added. ○ Voltage Testing Station – different voltage batteries (e.g. 1.5V, 3V) with buzzers so pupils can plan and carry out a fair test on how voltage affects loudness, using a results table template. ○ Evaluation and Reflection Station – prompt cards for pupils to explain what their results show, identify patterns, comment on reliability and suggest improvements to their investigation. ○ Energy Sources Comparison Table – information cards and sorting activity comparing renewable and non-renewable energy sources, with advantages, disadvantages and environmental impacts.	support pupils to plan a fair test about how distance from a light source affects shadow size (variables, predictions, method). ○ Refraction and White Light Table – prisms, water-filled containers and clear blocks for pupils to observe refraction and explore how white light can be split into different colours. ○ Evaluation and Reflection Station – sentence starters and question cards to help pupils evaluate results (e.g. patterns, reliability, improvements, anomalies). ○ Light Pollution Awareness Area – information cards and images about light pollution with discussion prompts and a design task (e.g. "Design a streetlight that reduces light pollution"). ○ Reduce Light Pollution Challenge – pupils create posters or action plans suggesting ways to reduce light	models (e.g. squeeze bottles/tubing) to demonstrate how the heart pumps blood around the body and supports understanding of blood flow. ○ Blood Flow Pathway Challenge – sequencing cards for pupils to order the journey of blood around the body, including oxygenated and deoxygenated blood. ○ Oxygenated vs Deoxygenated Sort – sorting activity using statements, diagrams and colour-coded cards to show differences and where each type of blood is found in the body. ○ Healthy Diet Station – food group sorting activity (fruit and veg, carbohydrates, protein, dairy, fats and sugars) with discussion prompts about their impact on the body. ○ Drugs and Body Effects Awareness Area – age-appropriate information cards about different types of drugs (medicines, legal drugs, illegal drugs) and their effects on the body. ○ Smoking and Vaping Impact Display –	about similarities and differences. ○ Animal Adaptations Investigation Table – fact cards and images showing animals adapted to different environments (e.g. desert, Arctic, rainforest) with prompts to explain how features help survival. ○ Plant Adaptations Explorer – real plants or photos showing features such as waxy leaves, thorns, large leaves, deep roots; pupils match adaptations to habitats and explain why they help. ○ Natural Selection Simulation – simple paper-based or model activity (e.g. coloured "bugs" on different backgrounds) to demonstrate how camouflage affects survival over time. ○ Evolution Timeline Area – sequencing cards showing changes in a species over time to support understanding of	information cards, pictures, and timelines about Mary Anning and her discoveries, including ammonites, ichthyosaurs and plesiosaurs. ○ Observation and Recording Station – worksheets, journals, or digital tablets for pupils to record fossil characteristics, compare species over time and note evidence for evolution. ○ Fossil Sorting and Classification Area – activities to group fossils by type, age, or species to practice scientific classification and pattern recognition. ○ Timeline Modelling Activity – cards or digital resources to help pupils sequence fossils chronologically, showing gradual changes in species. ○ Vocabulary and Concept Match – key terms such as fossil, palaeontologist, extinct, sedimentary rock, evolution and

		○ Impact on the Environment Display Task – pupils create mini-posters or info cards explaining how renewable and non-renewable energy sources affect the environment (e.g. pollution, habitat loss, climate change). ○ Challenge Cards – deeper-thinking tasks (e.g. "Design a circuit with two bulbs and explain how to make one brighter" or "Which energy source would be best for a small village and why?").	pollution at home and in the local area. ○ Vocabulary and Concept Match – key vocabulary cards (reflection, refraction, transparent, opaque, translucent, white light, light source, light pollution) matched to definitions and examples.	information texts, images and short case studies to support pupils in explaining how smoking and vaping affect the heart, lungs and overall health. ○ Heart Rate Investigation Zone – stopwatches, timers, pulse measurement guides and investigation prompt cards to support planning, carrying out and evaluating how exercise duration affects heart rate. ○ Fair Test and Evaluation Station – planning templates, results tables and evaluation sentence starters (e.g. "The pattern I noticed was…", "To improve this investigation, I would…") ○ Health Choices Reflection Area – scenario cards where pupils discuss and record healthy choices that support the circulatory system.	evolution as gradual change. ○ Charles Darwin Research Station – short information texts, maps and images linked to the Galapagos Islands, with questions about why his observations were important. ○ Key Vocabulary Station – definition cards and matching activities for variation, inheritance, adaptation, evolution and natural selection. ○ Evidence for Evolution Table – simple examples (fossils, changes in animals over generations, selective breeding scenarios) for pupils to explain how we know living things change over time. ○ Explain It Board – sentence stems and challenge cards such as "This feature helps the animal survive because…", "Over many generations,	evidence matched to definitions and examples. ○ Explain It Board/ Discussion Area – prompts and sentence starters for pupils to explain how fossils provide evidence for evolution or how Mary Anning contributed to science.

					this species changed because…". ○ Discussion and Reflection Area – scenario cards asking pupils to explain how an animal or plant might need to change if its environment changes (e.g. colder climate, less food).	
	• Each science lesson will start with a 'Quick Quiz' which will recall information taught in the last lesson, last week, two or three weeks ago and last term or last year. • Exit quizzes will be used as and when appropriate. • Wherever possible, a quick verbal quiz of scientific knowledge, e.g. lining up at the door, waiting to get their things for home time. • Teachers will display the vocabulary related to their particular units on their working wall as well as the types of enquiry so children can relate to this when completing activities in class as well as retrieval activities. • Vocabulary Bingo! Teachers to create bingo cards with science terms or concepts and call out definitions or descriptions. This could be used within science lessons or as a recall activity at an opportune time for the class teacher.					
Commentary: Why are we teaching what we are teaching, in the order we are teaching global it? What does each unit build on/prepare children for? How are resources and skills changing over time?	**Living things and their habitats** This is the first Y6 unit as pupils have a strong understanding of this from previous year groups. Learners will be able to use their prior knowledge from Year 3 to help identify why a plant is living, and their knowledge from Year 5 to recap different organisms including flowering and non-flowering plants, vertebrates (mammals, birds, fish, amphibians and reptiles) and invertebrates. Pupils will also use their prior	**Electricity** This unit starts by building on pupils' understanding of circuits from Y4 to construct and draw series circuits using circuit symbols. It is essential at this stage that the children draw circuits accurately, using a ruler to draw wires. When pupils plan their voltage experiment, they will use prior knowledge of variables from Year 5, identifying and explaining the independent, dependent and controlled variables as well as the necessary equipment.	**Light** Light is taught in the spring term as pupils will be ready for the increased cognitive demands of this particular unit. In this unit's first lesson, pupils revisit and retrieve knowledge from Y3 about light, light sources and how light travels. In this unit the learners will use the fact that light travels in straight lines to look at how shadows are formed building further on the work from Y3 and revisiting the terms opaque, transparent and translucent.	**The circulatory system** Pupils learned about the digestive system in Y4. In this unit, they are introduced to the circulatory system for the first time. Learners should understand that the circulatory system is another system within our bodies that has a different overall function. Pupils' prior knowledge from Year 3 about muscles and their function will help them when they look at the heart as a muscle. In KS3, learners' will build upon their knowledge of the circulatory system and study the detailed structure of the	**Variation** Evolution and inheritance is taught in the summer term, split over three blocks, to avoid cognitive overload for learners. This unit begins by introducing pupils to the term 'variation' for the first time. They used the term 'organism' in autumn unit 1 to describe a living thing. They will now extend this to explore the term 'species' as a group of similar organisms where two parent plants can reproduce to	**Fossils** In Year 3, pupils explored the process of fossilisation. This will be revisited and their understanding deepened in this unit. When exploring fossils, pupils will revisit and retrieve the fact that evolution is the process where descendants develop different characteristics to their ancestors, creating new species. Pupils will link this learning to fossils, as a source of valuable evidence to show how organisms have changed over time. This

	knowledge from Year 4 regarding classification keys to help group and classify living things, but will look at these systems in more detail and discuss reasons why animals are placed in one category and not another. When classifying plants in previous years, pupils will have used the term "deciduous" and "evergreen", but this is now the first time they are introduced to the term "coniferous". During this unit, learners will explore microorganisms for the first time and will recap this knowledge during their DT project where they will make bread later in the year. Building upon this learning, in KS3, the children will use the Linnaean system to classify living things as well as look at complex food webs, energy transfer and the human impacts, conservation and ecosystem balance.	In KS3, pupils will build upon this learning by analysing series and parallel circuits with scientific symbols and measurements. They will also be introduced to static electricity and charge. **Renewable energy** This unit follows the electricity block so that pupils can apply the knowledge learned. They will compare the use of renewable energy to the burning of fossil fuels and the impact they have on the environment. This builds upon and further extends learners' knowledge of global warming from Year 5, revisiting understanding of terms including 'greenhouse gases, 'the greenhouse effect' and 'climate change'. In KS3, pupils build upon this knowledge when they continue to learn about renewable energy as part of the energy and electricity topics in the physics curriculum. They will study how different energy sources work,	In KS3, pupils will use this foundational knowledge to develop a deeper understanding of how light behaves as a wave, how it interacts with materials and its applications in the real world. **Light pollution** This unit follows the light block so that prior knowledge can be applied to this sustainability unit. Learners will further their understanding of light by exploring three types of light pollution, (glare, light trespass and skyglow) and their impact on living things. This learning will also help them to become more responsible global citizens as they move into secondary education and then adulthood.	heart, blood vessels and blood composition. They will also look at the specific functions of red/white cells, plasma and platelets as well as lifestyle effect and circulatory diseases. **Diet, drugs and lifestyle** In this unit, pupils explore the impacts of diet, drugs and lifestyle on overall body health. They will make links to learning from the previous unit about the circulatory system as much as possible to identify how diet can have positive or negative effects on the heart. Pupils will also build upon their learning from Year 3, where they explored the concept of a balanced diet and learnt about the five food groups and now exploring the impact of diet on overall heart health. In KS3, the children will learn how diet, drugs and lifestyle choices affect their health, particularly in relation to the circulatory, respiratory and digestive systems. This builds on the simple healthy eating knowledge from KS2 and introduces a more scientific view of nutrition and the effects of substances on the body.	create offspring. Having looked at sexual reproduction in Year 5, pupils should be aware that offspring from sexual reproduction are similar to the parents but are not identical. In KS3, this learning will be built upon when pupils explain variation using genes, environment and mutations. They will also link variation to evolution and natural selection. **Adaptations** In this unit, the pupils will look at plant adaptations, building on their knowledge from Y3 about the functions of plant parts. They will now describe and explain specific adaptations for plants to survive in desert environments. In this unit, pupils learn about Charles Darwin as their scientist which will help them with future learning in this block. In KS3, learners will build on this knowledge when they look at	unit will also build on and extend pupils' Y3 learning in literacy about Mary Anning. In KS3, this learning will be further extended when pupils undertake a detailed study of how fossils form and how they are used to explain evolution. They will also explore transitional fossils, dating methods and evolutionary significance.

		their environmental impacts and their role in society.			structural, behavioural and physiological adaptations. They will also conduct a detailed study of evolution by natural selection and look at fossils and genetics used to support evolutionary theory.	
Adaptations for LA pupils	• Pre-teach key vocabulary using pictures, word banks and simple definitions. • Use clear visual aids, real objects and examples to support understanding of living things, classification and microorganisms. • Break learning into small, manageable steps with clear modelling and frequent repetition. • Provide scaffolded classification keys with limited choices before increasing complexity. • Use practical sorting and matching activities (e.g. living/non-living,	• Pre-teach key vocabulary using pictures, word banks and simple definitions. • Use clear circuit diagrams, real components and demonstrations to support understanding. • Break learning into small, manageable steps with clear modelling and repetition. • Provide scaffolded circuit diagrams with partially completed symbols for pupils to finish. • Use hands-on activities to build simple circuits with adult support where needed.	• Pre-teach key vocabulary using pictures, simple definitions and word banks. • Use practical demonstrations (torches, objects, shadow experiments) to show how light behaves. • Break learning into small, manageable steps with clear modelling and repetition. • Provide visual diagrams and step-by-step explanations of how we see and how shadows are formed. • Use scaffolded investigation sheets for shadow experiments with	• Pre-teach key vocabulary using labelled diagrams, word banks and simple definitions. • Use clear visuals, models and videos to support understanding of the heart, blood and circulatory system. • Break learning into small, manageable steps with clear modelling and frequent repetition. • Provide scaffolded labelled diagrams of the circulatory system for pupils to complete. • Use hands-on or visual activities to sequence blood flow through the body. • Provide sorting activities (e.g. oxygenated/deoxygenated blood,	• Pre-teach key vocabulary using pictures, simple definitions and word banks. • Use clear visual examples (animals and plants) to support understanding of variation, inheritance and adaptation. • Break learning into small, manageable steps with clear modelling and repetition. • Provide sorting and matching activities (e.g. inherited traits vs learned traits, adapted/not adapted examples).	• Pre-teach key vocabulary using pictures, word banks and simple definitions. • Use fossils, images, videos and simple models to support understanding of fossil formation and change over time. • Break learning into small, manageable steps with clear modelling and repetition. • Provide sequencing activities to show how fossils are formed step by step. • Use scaffolded investigation sheets with prompts to

	animal/plant groups, microorganisms). • Encourage paired talk before independent work to build understanding and confidence. • Provide sentence stems and key words (e.g. "A living thing is…", "This belongs to the group because…", "A microorganism is…"). • Allow alternative recording methods such as drawing, labelling, matching, sorting tables or oral explanations instead of extended writing. • Reinforce key scientific vocabulary and concepts through regular recap and retrieval activities.	• Provide sorting activities (e.g. renewable/non-renewable energy, working/not working circuits). • Encourage paired talk before independent work to build understanding and confidence. • Provide sentence stems and key words (e.g. "A circuit is…", "The bulb is dimmer because…", "Renewable energy is…"). • Allow alternative recording methods such as drawing, labelling, matching or oral explanations instead of extended writing. • Reinforce key scientific vocabulary and concepts through regular recap and retrieval activities.	prompts for observations. • Provide sorting activities (e.g. light sources / not light sources, materials that block light / do not block light). • Encourage paired talk before independent work to build understanding and confidence. • Provide sentence stems and key words (e.g. "We see because…", "A shadow is formed when…", "Refraction is…"). • Allow alternative recording methods such as drawing, labelling, matching or oral explanations instead of extended writing. • Reinforce key scientific vocabulary and concepts through regular recap and retrieval activities.	healthy/unhealthy choices, food groups). • Encourage paired talk before independent work to develop understanding and confidence. • Provide sentence stems and key words (e.g. "The heart's job is…", "Blood carries…", "Smoking affects…"). • Allow alternative recording methods such as drawing, labelling, matching or oral explanations instead of extended writing. • Reinforce key scientific vocabulary and concepts through regular recap and retrieval activities.	• Use diagrams and simple models to explain natural selection and evolution over time. • Encourage paired talk before independent work to build confidence and understanding. • Provide sentence stems and key words (e.g. "Variation means…", "An adaptation is…", "Natural selection is…"). • Allow alternative recording methods such as drawing, labelling, matching or oral explanations instead of extended writing. • Use real-life examples to make abstract ideas more accessible (e.g. camouflage, different beak shapes). • Reinforce key scientific	support observation and simple explanations. • Encourage paired talk before independent work to build confidence and understanding. • Provide sentence stems and key words (e.g. "A fossil is…", "Fossils are formed when…", "This shows evolution because…"). • Allow alternative recording methods such as drawing, labelling, matching, sequencing or oral explanations instead of extended writing. • Use timelines and visual comparisons to support understanding of change over time. • Reinforce key scientific vocabulary and concepts through

					vocabulary and concepts through regular recap and retrieval activities.	regular recap and retrieval activities.
	○ Use structured templates and sentence stems to scaffold planning, observations, comparisons, explanations, evaluation of experiments, and classification tasks. ○ Incorporate sorting, matching and sequencing activities to reinforce understanding. ○ Break practical and written tasks into small, guided steps with adult support and frequent checks for understanding.					
Adaptations for GD pupils	• Encourage pupils to explain *why* classific ation systems are used, linking them to how scientists organise and understand biodiversity. • Use higher-order questioning (e.g. "Why might scientists disagree on how to classify a living thing?" "How do classification systems change over time?"). • Challenge pupils to design their own classification keys and justify the criteria they have chosen. • Encourage pupils to compare classification methods and explain similarities and differences between	• Encourage pupils to explain *how and why* electrical circuits behave, linking cause and effect when components are added. • Use higher-order questioning (e.g. "How does adding components affect the flow of electricity?" "Why does brightness or volume change?"). • Challenge pupils to design and draw increasingly complex circuits using correct scientific symbols, justifying their choices. • Encourage pupils to predict outcomes of circuit changes and explain their reasoning using scientific	• Encourage pupils to explain *how and why* light behaves in different ways, linking ideas of reflection, refraction and shadow formation. • Use higher-order questioning (e.g. "Why does light travel in straight lines?" "How does refraction change what we see?"). • Challenge pupils to apply their understanding to unfamiliar contexts, such as explaining real-world visual effects (e.g. rainbows, distorted images in water or glass). • Encourage pupils to predict and explain how changing variables (light source position,	• Encourage pupils to explain *how and why* the circulatory system works, linking structure to function across all components. • Use higher-order questioning (e.g. "Why is the circulatory system vital for survival?" "How do lifestyle choices affect the system over time?"). • Challenge pupils to explain and compare the roles of different blood components, linking them to their functions in detail. • Encourage pupils to trace and explain the full pathway of blood through the heart and body, using precise scientific vocabulary. • Explore how oxygenated and deoxygenated blood differ and how this	• Encourage pupils to explain *how and why* variation leads to differences within species, linking this to survival and reproduction. • Use higher-order questioning (e.g. "Why are no two offspring exactly the same?" "How does adaptation increase survival chances?"). • Challenge pupils to explain natural selection as a process over time, using cause-and-effect reasoning and scientific evidence. • Encourage pupils to compare adaptations across different species and explain how these help them	• Encourage pupils to explain *how and why* fossils provide evidence for evolution, linking changes in organisms over time to environmental adaptation. • Use higher-order questioning (e.g. "What can fossils tell us about how life on Earth has changed?" "Why do some organisms leave better fossil records than others?"). • Challenge pupils to evaluate how reliable fossil evidence is and what limitations scientists face when interpreting it.

	groups using scientific reasoning. • Explore microorganisms in greater depth, considering their role in ecosystems (e.g. helpful vs harmful microbes). • Challenge pupils to apply classification skills to unfamiliar organisms, explaining their decisions using evidence and precise vocabulary. • Provide opportunities for independent enquiry using real biological data and examples. • Expect pupils to synthesise learning and explain patterns across different groups of living things.	understanding of electricity flow. • Explore and compare renewable and non-renewable energy sources in depth, evaluating their environmental impact and sustainability. • Challenge pupils to consider real-world energy challenges and propose justified solutions for reducing environmental damage. • Encourage pupils to use precise scientific vocabulary and support explanations with evidence and reasoning. • Provide opportunities for independent enquiry into energy generation, efficiency and environmental impact.	object distance) affects shadow size and shape. • Explore white light as a combination of colours and consider how this links to natural phenomena. • Challenge pupils to evaluate the impact of light pollution and propose well-reasoned solutions at local and global levels. • Encourage pupils to use precise scientific vocabulary and support explanations with diagrams, reasoning and evidence. • Provide opportunities for independent enquiry and practical investigation into light behaviour.	supports respiration in cells. • Challenge pupils to evaluate the impact of diet, drugs, smoking and vaping on health, using evidence-based reasoning. • Encourage pupils to analyse how lifestyle choices can lead to long-term health consequences and propose informed health advice. • Provide opportunities for independent enquiry using scientific data, case studies or health information sources.	survive in specific environments. • Explore evolution as a gradual process and consider evidence that supports it, including fossil records and variation within populations. • Encourage pupils to evaluate the significance of Charles Darwin's work and explain its impact on scientific understanding. • Provide opportunities for independent enquiry, interpretation of evidence and use of scientific vocabulary to explain evolutionary change. • Expect pupils to construct reasoned explanations linking variation, inheritance, adaptation and evolution.	• Encourage pupils to compare fossils from different time periods and explain what this shows about evolution and adaptation. • Explore how changes in environments may have influenced the evolution of different species over time. • Encourage pupils to use scientific reasoning to link fossils, variation, and natural selection to broader evolutionary theory. • Provide opportunities for independent enquiry into palaeontology and the work of significant scientists such as Mary Anning. • Expect pupils to construct clear, evidence-based explanations using

						precise scientific vocabulary.
Resources/approaches	Rosenshine principles ○ **BBC Bitesize (KS2 Science – Living Things & Classification)** – explanations and interactive content on living vs non-living things, classification keys and microorganisms. ○ **Oak National Academy** – ready-made KS2 lessons on classification, identification,and understanding microorganisms. ○ **Royal Institution / Science Museum** – videos and practical demonstrations on classifying living things and exploring microorganisms. ○ **Practical resources / visuals (plants and animal identification guides, classification keys, microscopes or microscope images of microorganisms, charts for recording observations)** – to support hands-on classification and	Rosenshine principles ○ **BBC Bitesize (KS2 Science – Electricity & Energy)** – explanations and interactive content on series circuits, circuit symbols, complete and incomplete circuits, and renewable vs non-renewable energy. ○ **Oak National Academy** – ready-made KS2 lessons on electricity, investigating voltage and comparing renewable and non-renewable energy sources. ○ **Royal Institution / Science Museum** – videos and practical demonstrations showing series circuits, buzzer experiments and the environmental impact of different energy sources**.** ○ **Practical resources / visuals (circuit kits, batteries, bulbs, buzzers, wires, voltmeters, labelled diagrams, posters on energy sources)** – to	Rosenshine principles ○ **BBC Bitesize (KS2 Science – Light)** – clear explanations and short videos on how light travels, how we see, shadows, refraction and white light. ○ **Oak National Academy** – ready-made KS2 lessons covering light, shadow investigations, refraction and environmental issues such as light pollution. ○ **STEM Learning** – practical classroom activities and enquiry-based investigations focused on light, refraction and fair testing. ○ **Practical resources / equipment (torches, light boxes, screens, rulers or tape measures, prisms, mirrors, data tables, posters on reducing light pollution)** – to support hands-on investigation,	Rosenshine principles ○ **BBC Bitesize (KS2 Science – Circulatory System & Healthy Living)** – explanations, diagrams, and interactive content on the heart, blood, circulation, food groups, and effects of drugs, smoking and vaping. ○ **Oak National Academy** – ready-made KS2 lessons on the circulatory system, nutrition, effects of drugs and exercise investigations. ○ **Royal Institution / Science Museum** – videos and demonstrations on blood flow, heart function, and the impact of exercise and substances on the body. ○ **Practical resources / visuals (labelled heart and blood diagrams, pulse monitors or stopwatches, charts for recording exercise and heart rate, food models, images of drugs, smoking/vaping posters)** – to support hands-on investigation, observation and	Rosenshine principles ○ **BBC Bitesize (KS2 Science – Evolution & Inheritance)** – explanations, diagrams, and interactive content on variation, inheritance, adaptation, evolution and natural selection. ○ **Oak National Academy** – ready-made KS2 lessons on variation, adaptation, inheritance, natural selection and the contributions of Charles Darwin. ○ **Natural History Museum** – videos, exhibits, and interactive resources on evolution, adaptation and species variation. ○ **Practical resources / visuals (adaptation cards, images of plants and animals in different habitats, diagrams of inheritance, evolution timelines, Galapagos case**	Rosenshine principles ○ **BBC Bitesize (KS2 Science – Fossils & Evolution)** – explanations, diagrams, and interactive content on fossil formation, changes over time and evidence for evolution. ○ **Oak National Academy** – ready-made KS2 lessons on fossils, their role as evidence for evolution and notable palaeontologists. ○ **Natural History Museum** – videos, virtual exhibits, and practical resources on fossils, palaeontology and evolutionary evidence. ○ **Practical resources / visuals (fossil replicas, labelled diagrams, timelines showing evolutionary changes, Mary Anning case study materials)** – to

	observation of living organisms.	support hands-on experiments, data collection, and discussion of environmental impacts.	measurement and evaluation.	discussion of healthy living.	**studies)** – to support enquiry, comparison, and discussion of how species adapt and evolve.	support hands-on observation, investigation and understanding of fossil evidence in evolution.
Career links	Scientist: Libbie Hyman Unit 1 careers: Microbiologist Medical laboratory scientist Immunologist Food safety scientist	Scientist: Alexander Graham Bell Unit 2 careers: Electrical engineer Electrician Automotive electrician Unit 3 careers: Renewable energy engineer Wind turbine technician Energy scientist Electric vehicle engineer	Scientist: Ibn al-Haytham (Alhazen) Unit 4 careers: Optical physicist Astronomer Lighting designer Photographer Unit 5 careers: Sustainability consultant Urban planner Ecologist Environmental scientist	Scientist: William Harvey Unit 6 careers: Cardiologist Cardiac surgeon Nurse Paramedic Unit 7 careers: Nutritionist Dietician Sports nutritionist Personal trainer Public health officer	Scientist: Charles Darwin Unit 8 careers: Geneticist Evolutionary biologist Taxonomist Wildlife biologist Unit 9 careers: Evolutionary biologist Geneticist Medical researcher Forensic scientist	Scientist: Mary Leakey Unit 10 careers: Palaeontologist Geologist Archaeologist Museum curator