

St. Leonard's C of E Primary School



Science

End Points

Early Years

Below are the Early Learning Goals linked to Understanding of the World:

Past and Present	People, Culture and Communities	The Natural World
• Talk about the lives of people around them and their roles in society. • Know some similarities and differences between things in the past and now, drawing on their experiences and what has been read in class. • Understand the past through settings, characters and events encountered in books read in class and storytelling.	• Describe their immediate environment using knowledge from observation, discussion, stories, non-fiction texts and maps. • Know some similarities and differences between different religions and cultural communities in this country, drawing on their experiences and what has been read in class. • Explain some similarities and differences between life in this country and life in other countries, drawing on knowledge from stories, non-fiction texts and – when appropriate – maps.	• Explore the natural world around them, making observations and drawing on pictures of animals and plants. • Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class. • Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.

Year 1/2 Cycle A

	Just at/Securely At	Above/Greater Depth
Materials Everyday Materials	- Naming materials; sorting objects into groups based on the materials they are made from. - Naming everyday objects; identifying the materials objects are made from. - Recalling that a property is how a material can be described; using adjectives to describe everyday materials; recognising that objects are made from materials that suit their purpose. - Naming and sorting materials into groups based on their properties; describing what they notice when testing different materials for absorbency. - Suggesting ways that materials could be tested for waterproofness; making predictions and recognising whether their predictions were accurate. - Describing how materials respond to pulling, twisting, bending and tearing; using these observations to answer questions; beginning to recognise if a test is fair.	- Naming less familiar materials; recognising that materials can be described in different ways. - Recognising when an object is made from more than one material. - Giving examples of how a material's properties help objects to work. - Predicting outcomes based on prior knowledge and recognising that materials can have varying degrees of absorbency. - Using prior knowledge to make predictions; explaining why the properties of materials (fabrics) make them suitable for specific types of clothing. - Drawing on personal experiences to make predictions; comparing the results to their predictions; recognising where they do not match and using new knowledge to explain why.
Animals Including Humans Sensitive Bodies	- Drawing and labelling human body parts, naming animal body parts; using a Venn diagram to group body parts. - Drawing and labelling the body parts associated with each sense, using non-standard units to measure handspan, beginning to recognise patterns in data and using this to answer a question. - Identifying objects using their sense of touch, choosing appropriate words to describe the taste of foods; recording these in a table. - Using their noses (sense of smell) to match a range of different smells to their pictures; recognising that people rely on their sense of sight for a range of everyday activities and why scientists continue to research this area. - Naming the body part used for hearing, identifying objects based on the sounds they make; using their observations to answer a question. "Describing how a firefighter uses their senses at work and giving examples of how the senses are linked to feelings and actions.	- Naming less familiar body parts; describing some of the differences between human and animal body parts. - Describing some of the objects they can sense with their five senses (e.g. smells, textures and sounds); using data already collected to predict trends. - Describing and recording the taste and texture of foods in a table; choosing an appropriate method to record their observations. - Using their noses (sense of smell) and their previous life experience to identify a range of different items; choosing appropriate words to describe different smells. - Drawing and labelling a simple diagram to show that sound travels; beginning to recognise why sound gets quieter as you move further away. - Drawing on their own life experiences to suggest scenarios in which the senses can trigger specific feelings and actions.
Materials Uses of Materials	- Sorting objects according to different criteria, e.g. types of material and uses of objects; naming objects with the same use that are made from different materials; naming a material that is used to make objects with different uses. - Naming objects and the materials they are made from; describing the properties of materials and explaining why they are suitable/unsuitable for an object's use. - Recognising that stretching, twisting, bending and squashing can cause some solid objects to change shape; describing how objects behave after an action has been performed.	- Naming materials that are not suitable for specific objects and explaining why. - Naming materials that are not suitable for specific objects and explaining why. - Explaining why some objects return to their original shapes and why some remain in their new shapes. - Using their life experience to make predictions; using a ruler to measure to the nearest centimetre; using their results to explain how they know which material was the most and least stretchy. - Labelling axis titles and accurately labelling the scale on the y-axis in intervals of two.

	- Working in a group to measure length with non-standard units and recording the results, comparing and using the data collected to answer a simple question. - Measuring strength using non-standard units, labelling categories and recording results in a block graph; using these results to answer questions. - Naming properties that make materials suitable for their use; giving examples of how plastic is harmful to the environment; selecting eco-friendly materials.	Generating ideas for eco-friendly gifts and explaining why certain materials are better for the environment.
Animals inc Humans Comparing Animals	- Naming common animals, describing and comparing their physical features; sorting them into groups by recognising similarities and differences. - Identifying the characteristics specific to each animal group, naming a range of animal body parts and describing animals based on their unique features. - Recognising similarities and differences in animal features; using their observations to sort animals and choose appropriate group labels. - Recalling the diets of carnivores, herbivores and omnivores, sorting animals based on these groups; using non-fiction texts to find out specific animals' diets. - Recognising that there are different ways to gather data, recording data in a block graph and using this to answer questions. - Recalling what the scientist Jane Goodall was known for and some of her key findings.	- Describing the characteristics of different animal groups; using a Venn diagram to sort animals; recognising that some animals may fit into more than one group based on specific criteria. - Understanding how to order riddle clues from general characteristics to unique features; demonstrating prior knowledge of animal habitats, diets or behaviours. - Applying prior knowledge when comparing animal features; describing some non-appearance-related characteristics that animal groups share. - Recognising that animals have adaptations to help them obtain food; describing - Evaluating the efficiency of different data collection methods and using topic-specific vocabulary in their explanations and written work. - Recognising that scientists often have to overcome challenges as part of their work.
Plants Introduction to Plants	- Identifying a range of plants and their features, raising questions about plants; responding to suggestions on how to set up an investigation to answer a question. - Using a magnifying glass to observe the different parts of flowering plants, drawing and labelling a flowering plant; recalling some of the roles that flowering plant parts have. - Using a magnifying glass to observe closely, referring to an identification chart to name flowering plants; sorting them into groups based on specific criteria. - Naming some trees and their parts, identifying similarities and differences between deciduous and evergreen leaves; using non-standard units to measure leaf lengths. - Recognising similarities and differences in seeds and bulbs and using these observations to group them; recalling that seeds and bulbs come from plants; recognising that predictions do not always match observations. - Recognising that scientific research into plants leads to important discoveries; observing plant parts; describing what they notice and identifying which plant parts can be eaten.	- Demonstrating background knowledge to ask questions about plant growth; describing how to interpret data collected to answer a question. - Drawing on prior knowledge and using scientific vocabulary when describing the role of all four plant parts. - Describing differences between wild and garden plants; sorting images into a Venn diagram and recognising that certain plants may fit into multiple categories simultaneously. - Measuring leaf lengths in centimetres; carrying out secondary research to identify and name trees. - Using the data collected to look for patterns and investigating potential relationships between seeds and bulbs and the plants they will grow into. - Recognising that some plants have more than one edible part.

Making Connections Ocean Protectors	• Recalling some of the living things within rock pools and describing how they get their needs met; describing how rock pool conditions change throughout the day and year; recording their observations in a tally chart and summarising their observations. • Ordering the stages of a butterfly and ocean animal's life cycle and identifying similarities and differences; posing questions about different ocean animals using observations and scientific knowledge. • Recalling some different types of litter that affect ocean habitats and some of the problems they cause; suggesting ways to reduce how human litter affects the ocean; beginning to plan a method to investigate ocean litter; predicting changes to the litter soaked in water over time; observing and making comparisons of litter soaked in water over time. • Recalling how to write a food chain and producing an example from an ocean habitat; describing how litter can affect an ocean habitat food chain; summarising the results from the investigation and using this to explain which type of litter is worst; giving advice to protect oceans from litter. • Describing the role of a marine biologist; tallying the number of living things observed and recording this as a pictogram; comparing two sets of data as tallies or pictograms.	• Explaining how the removal of one living thing affects another that depends on it. • Posing further questions and explaining why or how these have changed through the lesson; using correct grammar when posing written questions. • Predicting the outcome of a variety of materials or litter soaked in water, with consideration of which will be affected during the lesson or over a week. • Forming an evidence-based argument about why ocean litter is so harmful; suggesting ways to reduce the impact of ocean litter, such as considering 'reduce, reuse, recycle' strategies to reduce what ends up in the ocean and using paper-based materials that can break up in water to make it safer for animals that may eat it. • Predicting what may have caused changes to populations using their knowledge of food chains.
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Year 1/2 Cycle B

	Just at/Securely At	Above/Greater Depth
Living Things Habitats	- Asking questions to further their knowledge; recalling some of the life processes and giving some examples of how they apply to plants or animals. - Using knowledge of the life processes to classify objects into alive, never been alive and was once alive, giving reasons for their choices. - Naming some habitats and describing the conditions and matching different plants and animals to their habitats. - Recalling some plants and animals in a woodland habitat and giving some examples of how animals use the woodland habitat for food and shelter. - Recalling that plants produce their own food for energy, giving examples of how a predator depends on other animals for food and giving examples of how animals depend on plants for shelter. - Naming living things that are producers and placing a producer at the beginning of a food chain; naming some carnivores, omnivores and herbivores and recalling what they eat; correctly orientating arrows to show the order in which living things eat each other in a food chain.	- Asking questions about commonalities between living things; explaining how life processes apply to different living species. - Using a broader range of life processes to explain their reasoning. - Giving examples of what a habitat provides for the plants and animals that live there. - Giving examples of how some animals are adapted to survive in a woodland habitat. - Explaining how some plants and animals have features that help them to find food, to make their own shelters or to protect themselves from predators. E.g. The poison dart frog has poisonous skin that kills the predators who eat it. - Naming living things as producers, prey or predators and using prior knowledge to draw a food chain independently.
Forces and Space Seasonal Changes	- Naming the four seasons and describing the typical weather that occurs in each season. - Naming some activities and events that take place in the four seasons and suggesting appropriate clothing to wear in different weather conditions. - Naming the four seasons in order and describing the appearance of a tree's leaves in each season. - Completing a pictogram and using it to answer simple questions, understanding that summer has the most daylight hours and winter has the least daylight hours. - Understanding that a thermometer can be used to measure temperature; recording data about the temperature across the four seasons, recognising that it is hottest in the summer and coldest in the winter. - Labelling a map of the UK with capital cities and seasonal weather symbols and describing the weather and how to prepare for different conditions.	- Naming the four seasons in order and explaining some of the changes which occur in each season, e.g. the weather, the trees, events and activities. - Explaining why some activities and events take place in a particular season, e.g. people may go camping in summer because it is hot, and suggesting appropriate clothing to wear in different weather conditions. - Describing some changes in trees, plants and flowers throughout the four seasons and linking some of these changes to seasonal weather patterns. - Completing a pictogram and using it to find answers to questions, understanding that the sun rises and sets at different times throughout the year and that this affects the number of daylight hours in each of the four seasons. - Understanding how to use a thermometer to measure temperature in degrees Celsius and making comparisons about the temperature in all four seasons. - Labelling a map of the UK with a range of cities, seasonal weather symbols and temperatures, using key vocabulary to describe the weather and how to prepare for different conditions.

Living Things Microhabitats	• Grouping minibeasts based on observed similarities and differences; organising questions to create a simple classification key. • Asking suitable questions about worms; recognising some ways in which questions can be answered; using a text to answer questions. • Gathering data about minibeasts found in different microhabitats; using data to answer a question; giving examples of how microhabitats suit the needs of the minibeasts that live there. • Asking questions about minibeasts; suggesting how the equipment could be used to carry out an experiment and what observations to make; ordering the steps of the method. • Using simple equipment to gather data; recording tally marks in a table; using their results to answer a question. • Describing the appearance of flowering plants; using an identification chart to name flowering plants; describing the role of a botanist.	• Choosing their own criteria to group minibeasts; creating a classification key with a logical question sequence. • Using a text to find answers to specific questions and writing down the answers; giving reasons for their predictions. • Gathering tally data to record the number of minibeasts found in different microhabitats; giving examples of ways in which microhabitats depend on minibeasts. • Adding adverbs to the method to give more detail; explaining how they will use their observations to answer the question. • Making predictions based on prior knowledge; recognising how the method of an experiment could be improved. • Using a range of adjectives to describe the appearance of flowering plants in detail; recognising similarities and differences.
Animals inc Humans Life Cycles and Health	• Identifying animal offspring; ordering the human life cycle; describing some indicators of each stage of the human life cycle. • Matching animals with their offspring; identifying different stages of specific animal life cycles; ordering an animal life cycle. • Measuring using a tape measure; recording in centimetres; creating a graph; drawing conclusions from the results. • Describing that all animals need air, water and food to survive; identifying that humans gather food differently to animals in the wild; explaining how a specific animal survives. • Describing how germs spread through contact by referencing the glitter experiment; describing how to take care of their personal hygiene; collecting data over time; observing improvements after exercise. • Recognising that a decreasing time or increasing distance indicates improvement; naming foods from each food group; selecting foods to create a balanced shopping list.	• Labelling their life cycle with key indicators for each stage of the life cycle; describing verbally what might happen if we did not stop growing. • Applying knowledge by ordering a life cycle with less familiar stages. • Considering further developments other than height and describing these orally. • Predicting what might happen if only provided with a single food source. • Creating questions to help understand how exercise or hygiene routines change as we get older; using their own knowledge to describe how to keep clean without water. • Recognising different ingredients to create a balanced shopping bag for someone with dietary requirements.
Plants Plant Growth	• Suggesting conditions necessary for seed growth, setting up comparative tests by changing these growth conditions; planning observations and measurements to monitor these changes. • Recalling that seeds have all the necessary parts inside for the plant to grow when the conditions are right; using a ruler to measure and record the height of their plant stem. • Recalling that seeds need water and warmth to germinate, recording plant growth data in a table; comparing plant growth in different test conditions. • Using a magnifying glass to observe and compare plants, recognising that light is required for healthy growth; recording plant growth data over time. • Sequencing and describing the stages of a plant's life cycle; drawing diagrams to represent each stage.	• Suggesting how often the seeds should be watered; explaining why it is important to plant some seeds in standard conditions. • Drawing a detailed diagram of their plant including labels and captions to describe how a seed uses its energy to to grow when the conditions are right. • Predicting how dark conditions will affect the growth of a seedling, explaining their reasoning. • Making links with previous knowledge; recording height in centimetres and millimetres. • Distinguishing between the life cycles of different plant types; adding detail to their diagrams by drawing on prior knowledge.

	Recalling that plants need water, light and warmth for growth, recognising the importance of healthy plant growth; describing some positive and negative influences humans have on plants in the environment.	Justifying why certain conditions are beneficial but not essential for healthy plant growth; drawing on their observations throughout the unit to add detail when describing what plants need for healthy growth.
Making Connections Fairytale Science	- Describing the features of different animal groups; naming the body parts and features of different animals; measuring time in seconds; using time to compare the speeds of different animals. - Naming some common materials; listing some properties of materials; using adverbs of time to order a method; following a simple method. - Building a home with natural materials, suggesting how to test if it is waterproof; recognising that tests should be the same for each group. - Naming the five senses; naming the body parts that sense them; observing different feelings of touch; recording observations in a table. - Using touch to compare different materials; using touch to compare layers of a material; labelling a block graph; colouring the correct number of blocks on a block graph; using a block graph to answer a question.	- Suggesting a method to test the speed of other animals. - Choosing appropriate waterproof materials to design a wet suit or boat for the Gingerbread Man. - Evaluating their homes by identifying improvements; suggesting further testable questions. - Applying their data on touch to explain why touch is an important sense and why it varies in different parts of the body. - Collecting independent data and recording it in a table and block graph.

Year 3/4 Cycle A

	Just at/Securely At	Above/Greater Depth
Animals including Humans Movement and Nutrition	- Recalling the three key functions of the skeleton (movement, support and protection). Describing a vertebrate, invertebrate, endoskeleton and exoskeleton and using this information to group animals. Explaining the key role of joints and identifying them on a skeleton. - Identifying and naming the skull, spine, ribs and pelvis on a diagram. Recording measurements of different bones and using the data to sort them into size order. - Recalling that muscles cause movements in the body, some of which we can control consciously. Describing that muscles can cause a movement by shortening and pulling on a bone. Describing some ways scientific research has improved the field of bionics/prosthetics, such as the choice of materials or linking their movement to muscles in the arm. - Recalling that animals, including humans, need to eat food to survive. Identifying examples of how the body uses energy. Making comparisons about the energy demands of different people. Finding relevant data on food packaging and making numerical comparisons. - Listing the seven nutrient groups. Describing the role of each nutrient group in the body. Identifying foods included in different nutrient groups. - Comparing two different meals and explaining which is more balanced by naming the nutrient groups and commenting on the relevant proportions.	- Applying the functions of the skeleton to predict the consequences of a broken bone. - Evaluating the data collected and suggesting improvements, such as ways to avoid human error and repeating results with more bones from the same species. - Describing the similarities and differences between a real hand and a model or prosthetic hand. - Identifying factors which could affect energy usage of different living things. - Making comparisons between different people's dietary needs. Justifying opinions using scientific vocabulary. - Assessing why certain meal choices may not be suitable for others and suggesting changes to a meal to suit different dietary requirements.
Materials Rocks and Soil	- Defining the term 'rock'; describing the appearance of different rocks; identifying crystals and grains; using a magnifying glass correctly; making and recording detailed observations. - Grouping rocks by their absorbency, reaction to acid rain (vinegar) and hardness; using results to choose the appropriate rock type for a specific use; suggesting better choices of rock for a specific use and predicting how a rock will be affected by the weather. - Describing how different factors break down rocks; using a model to demonstrate fossil formation; using a short film to sequence the steps of fossil formation; researching fossil formation using a single source (Pupil video: Fossil formation); presenting research in short film form. - Identifying fossils in rocks and grouping together rocks that contain fossils; describing the work of a palaeontologist; using a model to determine the relative age of a fossil; using the fossil record to suggest how a living thing has changed over time; using the fossil record to suggest what living things were around in a certain era. - Naming, describing, comparing and grouping some different types of soil; drawing and labelling the bars on a bar chart.	- Observing and describing a greater range of rocks; categorising rocks as sedimentary, metamorphic or igneous. - Using their knowledge of rocks to consider best use and inform design decisions. - Researching how different types of fossils are formed; adapting a model to show how different types of fossils are formed; using a short film to demonstrate how different types of fossils are formed. - Debating a theory using fossil evidence and scientific reasoning. - Observing the grain size of different soils and linking this to how quickly they drain. - Identifying and comparing different categories of soil.

	• Listing some of the benefits of earthworms to the soil; identifying and describing the layers in a sedimentation jar; accurately drawing and labelling the layers of sediment in a sedimentation jar.	
Forces and Space Forces and Magnets	• Defining a force and a contact force; identifying examples of pushes, pulls and twists; adding arrows and labels to create force diagrams. • Listing the effects of forces; defining the term 'friction' and listing some uses of friction; describe how surface roughness affects friction; using evidence to support a conclusion. • Describing and comparing how things move on rough and smooth surfaces; explaining why things move differently on rough and smooth surfaces; identifying the variables they need to change, measure and control. • Defining the terms 'magnetism', 'magnetic material' and 'non-magnetic material'; describing the poles of a magnet and how they attract and repel; naming some of the magnetic metals; writing a method; sorting and classifying materials as magnetic and non-magnetic. • Predicting whether two magnets will attract or repel, depending on which poles are facing; naming some examples of magnets; comparing the strength of different magnets; labelling the axes of a bar chart and drawing the bars accurately. • Listing and describing some of the uses of magnets; identifying key information from a source and using more than one source; creating a revision aid containing key information.	• Giving additional examples of pushes, pull and twists; recognising when opposing forces are acting; drawing their own examples of force diagrams. • Suggesting and describing additional examples of friction being useful or unhelpful. • Gathering repeat data and identifying anomalous results (results that do not fit the pattern); applying their understanding of materials and friction to design a hiking shoe. • Sorting and classifying a greater range of magnetic and non-magnetic materials; naming all the magnetic metals; describing the difference between a magnet and a magnetic material. • Identifying and describing how to improve a bar chart; writing a conclusion and referring to evidence. • Researching and recalling a greater variety of examples of the uses of magnets, including electromagnets; explaining how magnets are used to make different products work.
Energy Light and Shadows	• Recalling examples of light sources and objects that do not give out light; describing ways to protect eyes from light damage; recalling that darkness is the absence of light and we need some light to see. • Describing what reflection is and giving examples of materials that reflect light more; describing factors that may affect the quality of a reflected image. • Describing how shadows form; identifying patterns between opaque, translucent and transparent materials and the types of shadows formed; recalling some factors that affect the way a shadow appears; identifying if a question is testable and explaining why; beginning to plan ways of answering an enquiry question. • Recalling what causes shadows to change throughout the day and describing the pattern of change throughout the day; selecting which variables will be changed and measured in the experiment and a range of control variables to ensure a fair test. • Naming factors that affect the size of a shadow, including the distance of the light source; describing how the distance of the light source affects the size of a shadow; describing patterns in their collected data and quoting values to	• Justifying which light source they think is most important by making comparisons with different examples. • Naming a broader range of light sources and reflective materials and their properties in the acrostic poem. • Suggesting their own examples of testable questions relating to shadows; using a broad range of scientific vocabulary to describe and explain their observations. • Describing with a broad range of scientific vocabulary the relationship between the position of the Sun and the patterns of shadows throughout the day; identifying both similarities and differences when comparing shadows between summer and winter and explaining these based on the position of the Sun; independently suggesting some variables relevant to the experiment. • Measuring the shadows more accurately and with a more precise scale; applying experiences and scientific knowledge to suggest causes of odd data; justifying predictions of missing data using scientific patterns and vocabulary. • Applying knowledge of shadows in more than one way, such as using different types of materials to create different effects or moving the puppet closer to the light source to make it larger.

	prove the relationship; identifying results that do not fit the pattern and suggesting values for missing data. Explaining that opaque materials are most suitable for the shadow puppets as they block light; positioning shadow puppets so that a shadow is cast on the screen; describing an example of how someone works with light or shadows.	
Plants Plant Reproduction	- Identifying the basic needs of plants; describing how some plants fulfil these needs; posing testable questions to help set up an enquiry. - Identifying parts of a flowering plant; describing the function of parts of a flowering plant; creating a table to gather a set of results. - Describing how water moves through a plant; explaining the function of the stem; planning an enquiry using knowledge of a similar enquiry. - Describing the plant life cycle; explaining the role of flowers in pollination; drawing bars on a bar chart to show data. - Identifying the effects of different variables on the growth of plants and using knowledge to draw conclusions; identifying the steps in a method that were challenging to control; commenting on the quality of the results. - Identifying methods of seed dispersal; grouping seeds based on their method of dispersal; using results as evidence for a conclusion.	- Identifying testable questions for enquiries beyond those posed. - Describing plants that differ from most flowering plants; predicting which structures might be affected by lack of water. - Making links between the structures in plants that we eat and their role in water transport. - Identifying any data that does not fit the pattern in the results; identifying the importance of bees in pollination. - Suggesting further steps that could improve the method. - Suggesting ways human technology has copied seed dispersal methods.
Making Connections How does wind force affect seed dispersal?	- Describing that flowering plants use seeds to reproduce; explaining that seed dispersal provides better space and resources for growth; classifying the wind as a pushing force; sorting variables; writing a prediction. - Describing a force as a push, pull or twist; modelling a wind-dispersed seed that is pushed by the wind to gather data; describing the amount of friction in the air compared to in liquids or on solids; measuring distance accurately in centimetres and recording data in a table. - Grouping plants based on characteristics; drawing a bar chart; writing a conclusion that refers to data; explaining the results in terms of the effect of the wind's force and plant survival; evaluating the trustworthiness of a method; suggesting improvements to a method; posing further questions. - Describing how a sound forms and is measured; describing how a sound is heard; making links between the strength of vibrations and the volume of a sound; posing new enquiry questions; comparing different sets of results. - Describing wind dispersal of seeds and explaining why it is useful; describing human impact on seed dispersal; creating a poster to report on their findings; assessing the effectiveness of a presentation.	- Suggesting the changed, measured and control variables for the enquiry question; designing a results table independently with more than two columns; referring to observations of wind-dispersed seeds when writing a prediction. - Justifying the choice of seed and wind source using scientific ideas and language; measuring more precisely using decimals. - Adding multiple sets of data to a bar chart; including details of anomalous results that do not fit the pattern and suggesting explanations for them. - Making links between the wind dispersal and wind volume enquiries, including that the vibrations that cause sound are also a pushing force; drawing a conclusion that uses scientific vocabulary. - Explaining choices of the variables and enquiry type.

Year 3/4 Cycle B

	Just at/Securely At	Above/Greater Depth
Energy Electricity and Circuits	- Recalling a range of electrical appliances and classifying them as mains or battery-powered. Drawing a results table and recording a range of appliances under the correct headings 'Mains' or 'Batteries'. Explaining why something is either mains or battery-powered. - Identifying and drawing simplified electric circuit symbols. Drawing a simplified circuit diagram. Explaining how to test if a circuit works. Identifying when simple electrical circuits will work. - Identifying the symbols for open and closed switches. Predicting whether a circuit will work based on whether the switch is open or closed. Explaining that a switch works by breaking and completing a circuit. Giving examples of how switches are useful. - Describing that a material is a good electrical conductor when it is added to an electrical circuit and the bulb lights and that a material is a good electrical insulator when it is added to an electrical circuit and the bulb does not light. Recalling that metals are good electrical conductors and plastics are good electrical insulators. Writing a method for the investigation that considers appropriate equipment, ordering clearly written steps and considering safety. - Describing that the more bulbs added to a series circuit, the dimmer the bulbs will be. Explaining that the bulbs will be dimmer when more are added to a circuit, as less energy is transferred to each of them. Posing questions relating to bulbs in an electrical circuit. Explaining why a selected question is testable. - Describing precautions for working safely with electricity. Explaining some precautions using knowledge of circuit diagrams, electrical components, conductors or insulators. Suggesting that new inventions will change safety advice.	- Deciding which arguments for and against mains or battery power are the strongest and justifying opinions. Evaluating the model electrical circuit by considering its limitations. Selecting an electrical appliance and explaining why it is either mains or battery-powered. - Explaining why scientists use circuit symbols. Explaining why a circuit will work or not. - Using symbols to create a simple circuit diagram for a complex circuit. Explaining how components work using more complex language, such as the effect of a switch on the flow of charge. - Predicting the conductivity of other objects or materials. Explaining predictions using their results. - Extrapolating relationships by predicting that using more than three bulbs will make them even dimmer. - Explaining a range of safety precautions using a broad range of scientific vocabulary. Justifying why one piece of safety advice may be more important than others.
Materials States of Matter	- Listing the properties of solids; identifying examples of solids; asking questions about the properties of solids; identifying which questions are relevant; identifying which properties to test; testing the properties of solids. - Listing the properties of liquids and gases; identifying examples of liquids and gases; testing the properties of liquids and gases; making careful observations and using these observations to draw simple conclusions. - Describing the conditions needed for melting and freezing; describing the property changes as a material melts or freezes; naming the start and end states when melting and freezing materials; using a thermometer accurately; reading a thermometer accurately. - Describing the conditions needed for melting and freezing; describing the property changes as a material melts or freezes; naming the start and end	- Using a Venn diagram to identify mixtures containing multiple states of matter; testing solids that appear to be compressible due to trapped air. - Testing liquids that provide less obvious results; discussing circumstances that may prevent a state from acting as expected. - Planning a test to compare the melting points of different materials. - Explaining how sweating cools the body through the process of evaporation. - Annotating a diagram; comparing a model water cycle with the real water cycle to identify similarities and differences; applying knowledge of evaporation rates to determine how climate change might affect the water cycle.

	states when melting and freezing materials; predicting how temperature and wind will affect evaporation rates. - Naming, ordering and describing the stages of the water cycle; drawing and labelling a diagram using key information. - Describing the effect of climate change on temperature; linking temperature change to evaporation rates; describing how climate change affects the water cycle; identifying key information from a source; using more than one source to research.	Using web resources to find out additional details about how climate change affects the water cycle; providing more examples of how climate change affects the water cycle.
Animals including Humans Digestion and Food	- Labelling key organs found in the digestive system and describing each of their functions. Explaining how the model represented each key function of the digestive system. - Evaluating a strength or weakness of the model. - Identifying and describing the functions of the four different types of adult, human teeth. Describing how X-rays can be used as evidence to study teeth. Making predictions about which teeth are missing in different diagrams. - Knowing that good dental care involves brushing their teeth twice a day with toothpaste and a soft toothbrush. Identifying limitations with the method. Knowing that scientific research needs repeated results before use in society. "Naming different teeth and describing what kind of diet they are used for. Producing a food chain that begins with a plant and has arrows that move up the food chain. - Defining a producer, predator and prey and identifying examples in food chains. Identifying trends in a predator-prey graph. - Drawing a results table that has space for observations about different poo samples. Describing digestion, teeth and diets when talking about the observed poo clues. Writing a letter that uses a range of scientific vocabulary from the unit.	- Evaluating the effectiveness of the model digestive system by considering strengths and weaknesses and suggesting improvements. - Explaining how humans would be affected by having missing teeth or only one type of tooth, using key vocabulary to justify opinions. - Considering strengths and weaknesses when evaluating a method and suggesting improvements for the limitations. Explaining why one set of results is not enough in scientific research before use in society. - Comparing teeth between animals. Explaining why animals have different teeth, and justifying opinions using scientific ideas and vocabulary. - Predicting missing values from a graph, explaining their choice using scientific vocabulary. Explaining how factors other than feeding relationships may affect population sizes. - Drawing a results table that also has space for a conclusion about the animal's diet. Linking digestion, teeth and diets in descriptions. Writing a letter that uses a broad range of scientific vocabulary from the unit.
Energy Sounds and Vibrations	- Defining the term 'vibration', identifying the part of an instrument making a sound and how different instruments make a sound; sensing different sounds using sight, touch and hearing; recording observations in a data table. - Describing how a sound waves travels through the air to the ear; comparing how sound travels through different mediums; explaining why sound travels faster and farther in water than air; using an article to research how whales and dolphins communicate; identifying the important information and using it to answer questions. - Defining the term 'volume'; identifying the unit of volume; describing how to change the volume of different musical instruments; drawing bars on a bar chart; reading the bars on a bar chart; using data to answer questions. - Describing what happens to the volume of a sound as the distance from the source increases and decreases; estimating the comparative loudness of a sound based on it's volume and distance; identifying which variables should be	- Describing using keywords how an instrument makes a sound and how the sound reaches your ears. - Explaining why sound travels fastest in solids and slowest in gases; describing how volume changes with distance; describing how whales and dolphins use echolocation to navigate. - Measuring the volume of everyday sounds and determining if they are safe; identifying how long a sound can be safely listened to; creating an infographic to display information. - Calculating the decibel change with distance, applying a pattern to predict which sound will be louder. - Drawing data tables with three columns, comparing pitch and volume; drawing sound waves to represent different pitch and volume sounds. - Designing ear protectors with consideration for the properties of the materials used; designing and drawing a results table.

	measured, how long to measure them for and what measuring equipment to use. - Defining the term 'pitch'; identifying the unit of pitch; describing how to change the pitch of different musical instruments; drawing a table with two columns; putting the headings in the correct place; filling data in a table. - Explaining why some jobs require ear protection; describing how insulating materials can be used to protect the ears; listing some examples of materials that are good insulators of sound; identifying a result that does not match a prediction; suggesting reasons it does not match.	
Living Things Classification and Changing Habitats	- Sorting living things into groups based on shared characteristics; identifying broad groups of animals (vertebrates and invertebrates); recording data in a Carroll diagram; recording data in a Venn diagram. - Sorting plants into groups based on shared characteristics; identifying broad groups of plants (flowering and non-flowering); choosing appropriate questions for a classification key; using a classification key. - Observing and describing the characteristics of different organisms from labelled pictures; using a classification key to group, identify and name local living things; drawing a classification key. - Recognising that different living things live in different types of habitats; describing and presenting how habitats change over the seasons; recording observations of how a habitat changes over the seasons. - Describing how human activities can change environments; identifying the positive and negative impacts humans can have on environments; identifying the key information from their research; using it to answer questions. - Describing how wildfires, earthquakes and floods affect habitats; identifying some of the impacts of natural disasters on wildlife.	- Creating Carroll and Venn diagrams; debating how humans should be sorted and classified. - Writing appropriate questions for a classification key; deducing missing questions from a completed classification key. - Creating more complex classification keys for larger groups of living things; observing the key characteristics of local birds from an unlabelled photograph and using these to classify them using a classification tool. - Researching additional detail on their season; deducing how a lack of seasons might impact the animals and plants that live in a woodland. - Researching in more detail; using multiple resources to research. - Describing how climate change might increase the incidences of flooding.
Making Connections How does food affect muscle fatigue?	- Naming different forms of energy; categorising different examples of energy form; forming a prediction; identifying variables; designing a results table. - Describing the change of chemical energy into movement energy; listing reasons for muscle fatigue; gathering data; recording data; measuring accurately in minutes and seconds. - Describing how the digestive system breaks up food to bring nutrients and energy into the body; explaining that muscles use carbohydrates absorbed from food in the digestive system to give muscles energy; drawing a bar chart; writing a conclusion; evaluating the trustworthiness of the method. - Making a simple circuit; describing the change of energy in a circuit; posing new questions. - Describing how shadows are formed; describing the role of joints in the skeleton; summarising their findings; writing a script to report on their findings; presenting their findings.	- Explaining why they think the other predictions are wrong using scientific reasoning; explaining what makes testing fair. - Identifying anomalous results; explaining how to correct for anomalous results using repeat data. - Adding multiple sets of data to a bar chart; including details of anomalous results that do not fit the pattern and suggesting explanations for them. - Drawing a circuit diagram for the fruit-powered circuit; explaining the function of a calorimeter and naming some scientists who use them. - Summarising how trustworthy the data collected was; describing how the investigation was extended.

Year 5/6 Cycle A

	Just at/Securely At	Above/Greater Depth
Animals including Humans Circulation and Health	- Recalling factors that improve someone's health and those that impact health negatively; suggesting improvements to someone's health; evaluating the trustworthiness of secondary sources that provide health advice. - Describing the circulatory system as the heart and blood vessels transporting blood around the body; recalling that the heart is a pump that pushes blood through the circulatory system; describing the pathway of blood through the circulatory system, including passing through the heart twice in a complete circuit through the body. - Describing some of the functions of blood, including transporting substances like oxygen, water and nutrients around the body; describing that nutrients and water are absorbed from the digestive system into the blood to be transported around the body; evaluating the model by considering a strength and weakness when representing blood and suggesting improvements. - Recalling what is meant by heart rate and researching using multiple websites to find reliable animal masses; identifying the pattern between animals' size and heart rate and quoting values as evidence; comparing class values and recognising when they do not match; using the identified patterns to predict new values. - Describing how different exercises affect heart rate; explaining why heart rate changes during exercise; writing a method for an enquiry with consideration of equipment, the different versions of the changed variable and how to complete the measured variable. - Describing what happens to heart rate during and after exercise; comparing two sets of heart data; identifying a link between heart rate and fitness; choosing a suitable title and axes labels with units for the line graph; plotting points on the line graph.	- Considering the likelihood of their advice being adopted by a patient to support evaluating its impact, such as suggesting someone takes the stairs instead of using a lift is more likely to be done than taking up a gym membership. - Identifying similarities and differences between the human and fish circulatory systems. - Evaluating the blood model by discussing both strengths and weaknesses of its representation of blood and suggesting improvements with justification of why it is better. - Evaluating the research of animals' masses and explaining why the class may have different values. - Planning how to investigate the effect of further exercises or factors on heart rate, considering the changed, measured and controlled variables. - Plotting two sets of heart rate data on the same line graph with greater accuracy and independence.
Forces and Space Earth and Space	- Describing the geocentric model and heliocentric models of the Solar System; describing the shape of celestial bodies; posing questions about the movement of the celestial bodies in our Solar System; identifying testable questions and which enquiry type is best used to answer them; asking further questions about the Solar System. - Naming the celestial bodies in the solar system and the force that keeps them in their positions; describing the orbits of celestial bodies in the Solar System; using a model to represent the Solar System; identifying the problems with the model; making improvements to the model. - Defining the term 'moon'; naming some of the phases of the Moon; describing the orbit of the Moon around the Earth; designing and draw a table to record data on moons; choosing appropriate headings for a table.	- Using evidence to support an argument; listing evidence to prove the Earth is not flat. - Independently researching the dwarf planet Pluto; explaining why Pluto does not fit the criteria to be a planet. - Naming all of the phases of the Moon; explaining the phases of the Moon using a model; researching the names of other moons. - Using knowledge of day and night and the tilt and orbit of Earth to explain why Polar North and South do not have a 24 hour day and night cycle. - Comparing a sundial and a watch; identifying the disadvantages of a sundial. - Independently researching a person of interest; writing a biography for a person of interest.

	- Describing how the Earth rotates on its axis; describing the tilt of the Earth; describing the orbit of the Earth around the Sun; shading day and night on the Earth; labelling the day and night and seasons diagrams; researching the time of day and night in other parts of the world. - Naming the parts of a sundial; explaining how a sundial works; calibrating a sundial using a compass and torch; using a sundial to measure time. - Listing some of the uses of satellites; explaining why space junk poses a problem to satellites; analysing patterns in temperature data for the Earth; drawing a line of best fit; predicting temperature values for the Earth in the future.	
Forces and Space Unbalanced Forces	- Defining the term gravity; explaining why unsupported objects fall towards the Earth; describing the relationship between mass and gravity; analysing data and identifying anomalies; comparing data to a prediction; describing the relationship between two variables. - Defining the term air resistance; describing the relationship between surface area and air resistance; identifying variables; writing a method. - Defining the term water resistance; describing the effects of water resistance; describing the relationship between surface area and water resistance; measuring time accurately; designing a results table for repeat data; calculating an average. - Defining the term friction; describing the effects of forces; predicting the outcomes of balanced and unbalanced forces; evaluating the degree of trust; identifying steps that need improving; suggesting improvements. - Explaining the purpose of levers, pulleys and gears; drawing a diagram of a wind powered pulley; labelling a diagram. - Naming the three things needed for a lever; listing uses of levers; explaining how changing the length of a lever will affect the effort needed to lift the load; labelling the axes on a line graph; plotting data on a line graph; drawing a line of best fit.	- Describing the relationship between distance and gravity; explaining the interplay between mass and distance and how these affect the gravity of different planets. - Describing the relationship between weight and air resistance. - Applying knowledge of air and water resistance and surface area to design streamlined objects; explaining the features that make them streamlined. - Extending an experiment into a new context; applying knowledge of friction to meet a design challenge. - Annotating a diagram to explain the important design features; identify design improvements; explain how pulleys work. - Extrapolating a line graph; estimating missing data using a line graph.
Energy Light and Reflection	- Describing similarities and differences between light sources; describing that light travels from these light sources to our surroundings, which enables us to see; describing that light travels in a straight line; describing observations that are evidence of light travelling in a straight line. - Describing how we see luminous and non-luminous objects; explaining how the eyes can be protected from too much light; drawing ray diagrams using a pencil and ruler, with light rays travelling in continuous, straight lines from a light source to the eye. - Recalling that the position and distance of the light source can affect a shadow's size; describing that the closer an object is to a screen, the smaller the shadow will be; explaining why shadows are affected by the distance	- Explaining why the choice of material of the equipment can impact the results, for example, opaque materials block light but transparent ones allow light to pass through easily. - Explaining how changing the material of objects in a ray diagram can affect the outcome; explaining why some animals have eyes on the side of their heads and how this affects what they see. - Describing that shadows cast closer to a light source appear sharper but shadows cast further from the light source have blurrier edges; explaining that multiple light sources can cause a shadow's edge to appear blurry as different shadows are being cast at the same time; suggesting improvements to the practical method to improve the maintenance of control variables and quality of results.

	between the object and the screen using a ray diagram; explaining why the shape of the shadow is the same as the object that cast it using a ray diagram. - Describing how light is reflected from a smooth mirror surface, naming the incoming and reflected rays; describing the relationship between the angle of the incoming ray and the angle of the reflected ray; using a protractor to gather data about angles and recording this as a line graph; using the line graph to extrapolate and predict missing values. - Building a working periscope using two mirrored surfaces that reflect light; describing the pathway of light from an object, through the periscope and into the eye; drawing a labelled ray diagram to explain how the periscope works. - Recalling a range of uses of mirrors; describing how the mirror is useful in a particular scenario; describing how light is reflected in the particular scenario; identifying a similarity or difference between different uses of mirrors.	- Explaining why this relationship is only true for a smooth, reflective surface such as a mirror; predicting what may be observed if a different material or surface was used in the experiment; identifying similarities and differences between the demonstrations of light passing through a hose and a stream of water. - Designing their own working periscope using provided materials; evaluating the strengths and weaknesses of their design and suggesting improvements. - Evaluating how useful a mirror is in a particular scenario by considering the advantages and disadvantages; drawing comparisons between different uses of mirrors, including both similarities and differences.
Materials Properties and Changes	- Defining the term 'hardness'; testing, comparing and grouping hard and soft materials; selecting materials for a specific purpose based on their hardness; identifying variables which are difficult to control; judging how these variables affect the degree of trust in results. - Defining the term 'transparency'; testing, comparing and grouping transparent, translucent and opaque materials; selecting materials for a specific purpose based on their transparency; identify which information should be recorded in a table and drawing a results table. - Defining the terms 'thermal conductivity' and 'electrical conductivity'; testing and comparing the thermal conductivity of different materials; choosing the appropriate material for a specific purpose; using sequential steps to write a method in a logical sequence; including necessary details in a method (variables, measurements, equipment and safety). - Defining the term 'reversible change'; describing how to reverse mixing and dissolving using separation techniques; describing how to reverse changes of state by heating and cooling; using previous scientific knowledge and evidence to inform predictions. - Defining the term 'irreversible change'; identifying and describing burning and rusting as irreversible changes; using observations to determine the necessary conditions for rusting. - Identifying and describing cooking and mixing vinegar and bicarbonate of soda as irreversible changes; measuring the circumference of a balloon accurately using string and a ruler.	- Testing soft materials with surprising results and explaining why they do not scratch. - Testing a greater range of materials; recording observations of how the clarity of an object viewed through different transparency material differs; suggesting uses for the materials tested based on their transparency. - Designing a multi-layered insulated cup; comparing the results of multi-layered cups with those of a single-material cups; analysing how the combination of materials affects heat retention. - Describing a greater range of reversible changes; identifying examples of reversible changes in everyday life; considering how reversible changes are linked to the water cycle. - Accurately recording how long each material burnt for; writing an independent conclusion. - Calculating an average using repeat data.
Making Connecti	- Describing some of the uses of space blankets; comparing different methods of heating; forming a prediction; identifying variables; designing a results table. - Describing the short and long-term effects of exercise on the human body; explaining why a space blanket is used after a marathon race by runners;	- Explaining why the incorrect predictions are wrong using scientific reasoning about reflection and heat; explaining what makes testing fair. - Identifying anomalous results; explaining how to correct for anomalous results using repeat data and a mean average.

	gathering and recording data accurately; measuring accurately in degrees Celsius. • Describing how light is reflected by shiny materials; explaining the difference between how light is reflected between shiny and matt materials; drawing a line graph; writing a conclusion; evaluating the trustworthiness of the method. • Describing different methods of separation; identifying a mixture; posing new questions. • Describing how light travels and how we see; explaining why sunglasses are needed to maintain health; summarising my findings; using the results as evidence of my conclusions; referring to the trustworthiness of my results as part of advertising space blankets.	• Estimating from a line graph; extrapolating a line of best fit; predicting new values. • Designing tests for other properties. • Using a broad range of scientific vocabulary; evaluating the degree of trust in their results when concluding about their investigations.
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Year 5/6 Cycle B

	Just at/Securely At	Above/Greater Depth
Living Things Classifying Big and Small	- Defining the term organism; naming some of the life processes; briefly describing the work of Carl Linnaeus; reproducing the Linnaean system diagram. - Defining a vertebrate and naming the vertebrate groups; describing some of the characteristics of fish, amphibians and reptiles and using a branching classification key. - Describing and comparing some of the characteristics of birds and mammals and using a branching key to classify them. - Defining invertebrates and naming, describing and comparing some of their characteristics; using a number key to classify invertebrates. - Naming the plant groups and describing some of the characteristics of mosses, ferns, conifers and flowering plants; making either a simple number key or a branching key to classify leaves. - Defining a micro-organism and naming some examples; describing some of the structures found in bacteria; using a classification key to classify shapes of bacteria.	- Naming all the life processes and describing each of them (except for respiration); explaining how modern science has refined the Linnaean system. - Researching and describing the characteristics of fish, amphibians and reptiles in greater detail; comparing the similarities and differences between cold-blooded vertebrates. - Researching, describing and comparing the characteristics of birds and mammals in more depth; comparing vertebrate groups; writing appropriate questions for a classification key to sort and classify birds and mammals. - Describing and modelling invertebrates in more detail; creating and using a table to compare the characteristics of invertebrates. - Researching and describing the characteristics of mosses, ferns, conifers and flowering plants in more detail; making a more complex branching and number key to classify more leaves. - Explaining why some bacteria have certain structures, linked to adaptation; drawing a bacterium diagram.
Materials Mixture and Separation	- Defining the term 'mixture' and naming some common examples; researching a mixture to find out what substances it is made from. - Defining the term 'sieving' and explaining how it can be used to separate mixtures; identifying when sieving should be used and alternatives (magnetism); drawing and annotating a diagram to explain how sieving separates a solid-solid mixture. - Defining the term 'filtering' and explaining how it separates mixtures; identifying when filtering should be used; identify and justify which type of enquiry to use to answer testable questions. - Defining dissolving and describing the formation of mixtures and solutions and how to tell the difference; naming some examples of mixtures and solutions. - Listing factors that affect the time taken to dissolve; suggesting variables to change, measure and control; recording data correctly; analysing a graph to draw simple conclusions. - Defining the term 'evaporation', describing the evaporation technique and identifying when it should be used.	- Describing how to identify a mixture (by appearance); describing the properties of the components of a mixture; suggesting how different mixtures could be separated. - Annotating a diagram in more detail; suggesting and describing real world applications of sieving (including in farming, gold panning and cooking). - Listing real world examples of filtering; applying their knowledge of filtering to real world examples such as making a cup of tea; explaining why solutions cannot be separated using filtering. - Describing the particle arrangement before and after dissolving; using the terms soluble and insoluble. - Explaining how to implement changing, measuring and controlling variables; taking accurate repeat measurements; measuring the temperature of the water and considering the implications for fair testing; analysing a graph to describe the relationship between the variables being changed and measured (the hotter the water, the faster the sugar dissolved). - Identifying conditions that will increase the time taken to evaporate (including wind and temperature).

Living Things Evolution and Inheritance	- Defining variation as differences between individuals of the same species; identifying variation in organisms; recalling that variation is caused by inherited and environmental factors and sorting examples as environmental variation, inherited variation or a mixture of both. - Identifying variation within a species and examples of inherited characteristics; recalling that living things produce offspring of the same kind but are not normally identical to their parents; describing patterns of inheritance from parent to offspring in a given example or family tree. - Recalling that an adaptation is a characteristic that helps an organism to survive in its habitat; recalling that adaptations cannot be chosen and are usually inherited; describing key characteristics that would help an organism to survive; explaining how an adaptation helps the organism to survive. - Describing relevant variation in a given population; explaining how variation can affect the survival of some individuals over others; recalling that natural selection is the process where living things that are better adapted are more likely to survive, whereas those worse adapted are more likely to die. - Recalling what evolution is; identifying differences between a living thing and its ancestor; describing key steps in the evolution of a species, including variation and those better adapted surviving and reproducing; describing some of the evidence used to form the theory of evolution, including fossils. - Recalling different types of evidence that can be used to explain evolution; describing methods that make scientists' results or conclusions more trustworthy.	- Identifying their own examples of variation that can be added to the Venn diagram. - Considering the ethics of selective breeding by considering why people may think it is right or wrong and whether rules should vary for different living things. - Evaluating a creature's chances of survival by explaining how multiple features help survival and suggesting improvements for any detrimental characteristics. - Considering other factors that may affect the finch's survival and explaining using scientific ideas. - Using a comic strip template with limited prompts to independently summarise some of the key steps involved in the evolution of mammoths; suggesting different environmental factors that may cause a species to evolve differently, such as warmer weather causing mammoths to evolve with less fur. - Using both the advantages and disadvantages of a type of evidence when justifying their opinions about the degree of trust.
Energy Circuits, Batteries and Switches	- Identifying and using standard circuit symbols; describing the function of key electrical components; explaining how the models used in the lesson represent electrical components. - Correctly predicting if an electrical circuit will work or not; explaining why a circuit will work or not using their knowledge of complete loops, power sources and presence of components; drawing circuit diagrams with straight lines and using standard circuit symbols. - Describing the relationship between the number of bulbs in a circuit and the bulb brightness; describing the link between the number of components and the amount of resistance; explaining that increasing the number of components increases the resistance and this affects the flow of current and energy transferred. - Identifying that batteries are a voltage source and that they come in different voltages; describing how voltage affects bulb brightness; designing a results table with an appropriate number of columns and headings with units. - Describing that voltage can be changed by using different numbers of cells in a circuit; identifying the changed variable and the measured variable; suggesting some control variables; describing that more cells or a higher voltage causes	- Evaluating the models of electrical circuits by considering the strengths and weaknesses of their representation. - Deciding how to best advise other people about working with electrical circuits safely. - Suggesting situations that would benefit from knowing how the number of components/bulbs affects the output/brightness. - Planning an experiment to test how voltage affects the brightness of a bulb, with consideration for the changed, measured and control variables; explaining how control variables can be kept the same. - Designing a new experiment to investigate the relationship between voltage and motor function; naming the changed variable and suggesting a measured variable; suggesting control variables. - Evaluating how effective the circuits are in solving the problem, considering the advantages and disadvantages of the circuit and build.

	brighter bulbs; using the relationship between voltage and bulbs to predict what will happen with buzzers and motors. Building an electrical circuit with a switch to control its function; drawing a circuit diagram that represents the circuit used, including standard circuit symbols; explaining how the switch and the electrical circuit solve the problem.	
Living Things Life Cycles and Reproduction	- Describing the plant life cycle; describing sexual reproduction in plants; dissecting a flower; observing the parts of a flower in detail using a magnifying glass; comparing equivalent parts in different flowers. - Describing the life cycle of a mammal; comparing the life cycles of different mammals; describing sexual reproduction in mammals; researching using a fact sheet; identifying relevant information. - Describing the life cycle of a bird; comparing the life cycles of different birds and the life cycles of mammals and birds; posing relevant questions about the life cycle of a bird; using technology to answer those questions; assessing the value of a question. - Describing the life cycle of an amphibian; comparing the life cycles of different amphibians; analysing data; using data to draw conclusions; identifying what further data is needed. - Describing the three-stage life cycle of an insect; describing the four-stage life cycle of an insect; comparing the life cycles of insects and amphibians; identifying patterns in data; using data to make predictions. - Describing the changes to a cutting as it grows; explaining the difference between a clone and other offspring; plotting data accurately on a line graph; estimating missing data from a line graph; extrapolating a line graph.	- Designing a three-column table; using sensitive scales to measure mass. - Explaining the unique method of diapause; linking life cycles to habitat adaptation. - Making links between life cycle stages and habitats; predicting how habitat changes might impact life cycles. - Planning and writing a detailed method to observe over time how the breeding seasons of amphibians change, accounting for variables. - Researching a greater range of insects; naming the larval and nymph stages of specific insects; explaining why insects often lay large numbers of eggs. - Drawing multiple data lines on a line graph; comparing model data to their data and suggesting reasons for any differences.
Making Connections Human Timeline	- Ordering the stages in growth and development from birth to old age; describing physical and developmental changes from a baby through to old age; describing growth from baby to adult; identifying where on a graph the rate of growth changes; using a line graph to make predictions about height. - Describing changes that occur in males and females during puberty; suggesting ways to manage the changes that occur during puberty. - Recalling what is meant by a gestation period; describing how gestation varies across animals and comparing this to humans; choosing a suitable title and axes labels for the scatter graph; plotting data on the scatter graph.	- Independently adding their own examples to the human timeline; explaining why some are more difficult to sort than others. - Explaining which aspect of puberty they would most like to remove and justifying scientifically. - Plotting the points on the scatter graph accurately; comparing the dependency of newborn animals to that of humans alongside the gestation period.

Making Connections How does light affect the direction of plant growth?	• Describing the plant life cycle; naming and drawing the components in a simple circuit; forming a prediction; identifying variables; designing a results table. • Grouping living things into the vertebrate, invertebrate and plant groups; explaining the advantage of phototropism; building a working circuit; following a method; recording data. • Naming and describe the forces of gravity, friction and air and water resistance; identifying evolutionary advantages and disadvantages of a specific adaptation; evaluating the trustworthiness of the method; summarising my findings; using the results as evidence of my conclusions.	• Explaining why the incorrect predictions are wrong using scientific reasoning about plant growth and adaptation; explaining what makes testing fair; designing a box with a route through it to see directional growth more clearly. • Explaining how advantageous traits (like phototropism) are passed on in a population and why phototropism gives an evolutionary advantage. • Debating a counter-argument effectively.
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