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YEAR GROUP	6
SUBJECT	Science
KEY VOCABULARY	Living Things: binomial system, bird, amphibian, reptile, mammal, fish, characteristic, classify, classification key, number key, cold-blooded, warm blooded, exoskeleton, conifer, fern, moss, flowering, plant, snail, spider, insect, worm, invertebrate, vertebrate, Linnaean system, Light and Reflection: cast, incoming ray, light ray, light source, luminous, mirror, non-luminous, opaque, transparent, translucent, periscope, pupil, ray diagram, reflected ray, reflective shadow. Evolution and Inheritance: adaptation, ancestor, characteristic, competition, environmental, evidence, evolution, extinct, fossil, gene, habitat, inherit, natural selection, offspring. Circuits, batteries and switches: ammeter, appliance, battery, bulb, buzzer, cell, circuit, circuit diagram, component, current, electricity, motor, power, source, resistance, insulator, conductor Circulation and Health: balanced diet, blood, bloodstream, blood vessels, carbon dioxide, circulatory system, diet, drug, exercise, fitness, health, heart, heart rate, lifestyle, lungs, mass, nutrient, oxygen, pulse, pump (verb), rate, resting heart rate, transport, water
END POINTS KNOWLEDGE	Animals including humans To know the main parts of the human circulatory system (heart, blood vessels and blood). To know that the heart pumps blood around the body. To know that the blood vessels transport blood around the body. To know that the blood transports vital substances around the body, including oxygen and nutrients. To understand the relationships between different organ systems. To understand the impact of diet, exercise, drugs and lifestyle on the way a body functions. To know that the heart rate is the number of beats per minute. To know that exercise increases heart rate. Living things and their Habitats To know that 'organism' is a term used to refer to an individual living thing. To know that micro-organisms are incredibly small and cannot usually be seen by the naked eye. To know the characteristics of the different groups of vertebrates and commonly found invertebrates. To know that living things have changed over time. To know that fossils provide us with information about living things that inhabited the Earth millions of years ago.

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	To know that characteristics are passed from parents to their offspring, but that all offspring vary from their parents. To know that over time, variation in offspring can affect animals' chances of survival in particular environments. To know that animals and plants have adapted to suit their environment over many millions of years and that this process can be called evolution <u>Light and Reflection</u> To know that light travels in a straight line from a light source. To understand that luminous objects are seen as a result of light directly entering the eye, whereas non-luminous objects reflect light into the eye. To know that shiny surfaces reflect light uniformly. To know that when light is reflected off a surface, its direction changes. To know that mirrors and periscopes work using reflection of light on smooth surfaces. To understand why shadows have the same shape as the objects that cast them as a result of light travelling in straight lines. To understand relationships between light sources, objects and shadows To understand how and why the distance between the object and the screen affects the size of the shadow. To understand how the angle of a reflected ray is affected by the angle of the incoming ray on a smooth surface. <u>Electricity</u> To know a wider variety of components in a series circuit (including buzzer and motor). To know the conventions used to draw circuit diagrams, including the recognised symbols for common components and using straight lines. Describe the function of key electrical components and explain how the models used in the lesson represent these. Correctly predict if an electrical circuit will work or not, explaining why using their knowledge of complete loops, power sources and presence of components. Describe the relationship between the number of bulbs in a circuit, the bulb brightness and the amount of resistance. Explain that increasing the number of components increases the resistance, affecting the flow of current and energy transferred. Identify that batteries are a voltage source; they come in different voltages, affecting bulb brightness. Describe that voltage can be changed using different numbers of cells in a circuit and that more cells or a higher voltage causes brighter bulbs. Use the relationship between voltage and bulbs to predict what will happen with buzzers and motors.

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Working Scientifically **Begin in yr 5 consolidate in yr 6**	**Posing questions** Raising questions throughout the enquiry process. Identifying testable questions. Selecting the most appropriate enquiry method to answer questions and give justification. **Planning** Suggesting which variables will be changed, measured and controlled. Making and explaining decisions about what observations to make and how long to make them for. Writing a method including detail about how to ensure control variables are kept the same. Writing a method that considers reliability by planning repeated readings. Suggesting the most appropriate equipment to make observations and measurements and justifying their choices. **Predicting** Making increasingly scientific predictions by: Using previous scientific knowledge and evidence to inform their predictions. Using scientific language to describe a potential outcome or explain why they think something will happen. Making links between topics to evidence a prediction. **Observing (qualitative data)** Using their senses to describe, in detail and with a broader range of scientific vocabulary, what they notice or what has changed. **Measuring (quantitative data)** Using standard units to measure and compare with increasing precision (decimals). Reading a wider variety of scales with unmarked intervals between numbers. **Researching** Gathering answers to open-ended questions from a variety of sources. **Recording (diagrams)** Drawing scientific diagrams by: Using a wider range of standard symbols. Drawing with increasing accuracy.

	Labelling with a broader range of scientific vocabulary. Annotating diagrams to explain concepts and convey opinions. **Recording (tables)** Using tables with columns that allow for repeat readings. Suggesting headings to tables, including units. Designing results tables with increasing independence with consideration of variables where applicable. Calculating the mean average **Grouping and classifying** Grouping in a broader range of contexts. Organising the layout of number and branching keys. Formulating appropriate questions for classification keys. **Graphing** Representing data by using line graphs and scatter graphs. Plotting points with greater accuracy. Reading the value of plotted points with greater accuracy. **Analysing and drawing conclusions** Writing a conclusion to summarise findings using increasingly complex scientific vocabulary. Suggesting with increasing independence how one variable may have affected another. Quoting relevant data as evidence of relationships. Identifying anomalies in repeat data and excluding results where appropriate. Comparing individual, class and/or model data to the prediction and recognising when they do not match. Using identified patterns to predict new values or trends **Evaluating** Identifying steps in the method that need changing and suggesting improvements. Identifying which variables were difficult to control and suggesting how to control them better. Commenting on the degree of trust by also reflecting on: Accuracy (human error with equipment). Reliability (repeating results). Sources of information (e.g. websites, books). Posing new questions in response to the data that would extend the enquiry. Deciding what data to collect to further test direct relationships.

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IT HELPS IF I ALREADY KNOW	Animals including humans Order the stages in growth and development from birth to old age. Describe physical and developmental changes from a baby through to old age. Describe changes that occur in males and females during puberty. Suggest ways to manage the changes that occur during puberty. Recall what is meant by a gestation period. Describe how gestation varies across animals and compare this to humans. Living things and their Habitats Describe the life cycle of a plant, including the reproductive stage. Describe the life cycle of a mammal. Describe the life cycle of a bird and compare it with that of a mammal. Describe the life cycle of an amphibian. Describe the life cycle of an insect and compare it with that of an amphibian. Describe asexual reproduction in plants. Light and Reflection To know that light travels from a source (e.g. the Sun, light bulbs and torches). To know that light is needed to see things and that dark is the absence of light. To know that light from the Sun can be dangerous and how to protect their eyes. To know that all materials reflect light. To know that shadows are formed when the light from a light source is blocked by an opaque object. To know that shadows change as a result of different factors: - Changing the position of the light source. - Changing the distances between the light source, object and surface. To know that shadows change position and length throughout the day as the Sun changes position in the sky Electricity To know that all electrical appliances need a power source, including batteries or mains electricity. To know that an electrical circuit needs a complete path for the electrical charge to flow through. To know the main components in a simple series circuit. To know the precautions for working safely with electricity. To know that some materials allow electrical charge to pass through them quickly and these are known as electrical conductors (e.g. metals). To know that some materials do not allow electrical charge to pass through them easily and these are known as electrical insulators (e.g wood and plastic). To know that metals are used for cables and wires because they are good conductors of electricity.

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	To know that plastic is used to cover cables and wires because it is a good insulator. To understand that an open switch breaks a series circuit so the components will be off. To understand that a closed switch completes a series circuit so the components will be on. To understand the relationship between bulb brightness and the number of bulbs in a circuit.