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| **Science**  **Year 6**  **2024 – 2025** | | |
| **Autumn 1**  **Living Things: Classifying Big and Small** | | |
| Vocabulary | Knowledge | Objectives |
| * Binomial system * Characteristic * Classify * Classification key * Conifer * Species | * Define the term ‘organism’ and name the seven life processes of all living things. * Describe the work of Carl Linnaeus. * Define the term ‘vertebrate’ and name the vertebrate groups. * Describe the characteristics of fish, amphibians, reptiles, birds and mammals. * Compare the characteristics of the vertebrate groups. * Define the term ‘invertebrate’. * Describe the characteristics of worms, snails, spiders and insects. * Compare the characteristics of the invertebrate groups. * Name the plant groups. * Describe the characteristics of flowering plants, ferns, mosses and conifers. * Define the term ‘micro-organism’ and name some examples. * Use a classification key to group and identify organisms. * Make a simple classification key. | 1. To explain how organisms are classified using the Linnaean system. 2. To classify the cold-blooded vertebrate groups using their common characteristics. 3. To classify the warm-blooded vertebrate groups using their common characteristics. 4. To classify invertebrates. 5. To describe how the plant kingdom is organised (based on shared characteristics). 6. To describe and classify micro-organisms. |
| **Autumn 2**  **Energy- Light and Reflection** | | |
| Vocabulary | Knowledge | Objectives |
| * Incoming ray * Luminous * Periscope * Pupil * Reflected ray * Reflective shadow | * Compare sources of light and explain how the eye is protected from light. * Describe how light travels and how we see luminous and non-luminous objects. * Recall factors that affect the size of a shadow and describe how the distance between an object and the surface its shadow is cast on affects the size of the shadow. * Use ray diagrams to explain why shadows change size and why the shape of a shadow matches the object that cast it. * Recall what happens to light when it reaches a smooth mirror surface. * Identify the incoming and reflected rays and describe the relationship between their angles. * Use mirrors to make a working periscope and explain how a periscope works using ray diagrams. * Recall a range of uses of mirrors and reflection and describe how a mirror reflects light in different situations. * Explain how light is reflected using knowledge of light and reflection. * Make observations about the properties of light. * Use my observations as evidence to support conclusions about light. * Draw ray diagrams. * Pose testable questions in response to observations * Record my measurements as a line graph. * Use my line graph to extrapolate data and make predictions about missing values. * Recall various jobs or inventions that use mirrors and reflection. | 1. To describe the pathway of light. 2. To describe how we see. 3. To explain how shadows change. 4. To investigate what affects the angle of the reflected ray. 5. To explain how a periscope works. 6. To explain how mirrors are helpful. |
| **Spring 1**  **Living Things: Evolution and Inheritance** | | |
| Vocabulary | Knowledge | Objectives |
| * Adaptation * Characteristic * Evolution * Gene * Inherit * Natural selection | * Define and identify variation in organisms and recall that it is caused by inherited and environmental factors. * Recall that living things produce offspring of the same kind but are not normally identical to their parents. * Describe patterns of inheritance from parent to offspring in a given example or family tree. * Describe what an adaptation is; it cannot be chosen and is usually inherited. * Describe key characteristics that would help an organism to survive and explain how an adaptation helps the organism to survive. * Explain how variation may affect survival within a population and recall what natural selection means. * Recall what evolution is, identify differences between a living thing and its ancestor and describe key steps in the evolution of a species. * Recall different types of evidence that can be used to explain evolution and describe methods that make scientists’ results or conclusions more trustworthy. * Sort variation as environmental, inherited or a mixture of both. Evaluate a method by recalling variables that were effectively kept the same and those that were harder to control. * Comment on the reliability of the results and the degree of trust. * Consider how evidence is used to form theories and the degree of trust the evidence offers | 1. To explain why there are differences within a species. 2. To recognise the inheritance of characteristics in plants and animals. 3. To explain why adaptation is necessary. 4. To model how natural selection affects population size. 5. To describe the theory of evolution. 6. To recognise evidence that can be used for evolution. |
| **Spring 2**  **Circuits, batteries and switches** | | |
| **Vocabulary** | **Knowledge** | **Objectives** |
| * Ammeter * Battery * Circuit diagram * Component * Current * Resistance | * 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. * Build an electrical circuit with a switch to control its function, explain how the switch and the electrical circuit solve the problem and recall different examples of problems that can be solved using an electrical circuit. * Draw circuit diagrams with straight lines and using standard circuit symbols. | 1. To use recognised symbols for electrical components. 2. To predict and present results for electrical circuits. 3. To recognise a link between the number of components and resistance. 4. To identify ways to change voltage within an electrical circuit. 5. To investigate how voltage affects bulb brightness. 6. To apply knowledge of circuits and components to a practical solution. |
| **Summer 1**  **Animals: Circulation and Health** | | |
| Vocabulary | Knowledge | Objectives |
| * circulatory system * drug * heart rate * nutrient * rate * resting heart rate | * Recall factors that improve someone’s health and those that impact health negatively and suggest improvements to someone’s health. * Describe the circulatory system as the heart and blood vessels transporting blood around the body and recall that the heart is a pump that pushes blood through the circulatory system. * Describe the pathway of blood through the circulatory system, including passing through the heart twice in a complete circuit through the body. * Describe some of the functions of blood, including transporting substances like oxygen, water and nutrients around the body. * Recall what is meant by heart rate and research using multiple websites to find reliable animal masses. * Identify the pattern between animals’ size and heart rate and quote values as evidence. * Describe how different exercises affect heart rate and explain why heart rate changes during exercise. * Describe what happens to heart rate during and after exercise and compare two sets of heart data to identify a link between heart rate and fitness. * When working scientifically, pupils who are secure will be able to: * Evaluate the trustworthiness of secondary sources that provide health advice. * Evaluate the model blood by considering a strength and a weakness when representing blood and suggesting improvements. * Compare class values and recognise when they do not match. * Use identified patterns to predict new values. * Write a method for an enquiry with consideration of equipment, the different versions of the changed variable and how to complete the measured variable. * Choose a suitable title and axis labels with units for the line graph and plot points on the line graph. | 1. To identify factors that affect our health and how to reduce their negative impact 2. To summarise the key structures and purpose of the circulatory system. 3. To identify the key roles of blood. 4. To explore the relationship between animal size and heart rate. 5. To investigate the relationship between exercise and heart rate. 6. To describe the relationship between heart rate and fitness. |
| **Summer 2**  **Making connections: Are some sunglasses safer than others?** | | |
| Vocabulary | Knowledge | Objectives |
| All key vocabulary from throughout the year | * Recall key knowledge from previous units. * Apply knowledge in new contexts. * Carry out a full scientific enquiry. | 1. To revise the units Circulation and health and Light and reflection 2. To revise the units Light and reflection and Circuits, batteries and switches. 3. To revise the units Light and reflection and Circulation and health. 4. To revise the units Classifying big and small, Evolution and inheritance, Light and reflection and Circulation and health. 5. To revise the units Light and reflection and Circulation and health. |