**UKS2 Cycle B**

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| **Electricity:**Pupils should be taught to: * associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit
* compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches
* use recognised symbols when representing a simple circuit in a diagram.
 | **Questions (and different enquiries used to answer them):****Can I discover the importance of the major discoveries in electricity?**Can I observe and explain the effects of differing volts in a circuit? Can I understand the variations in how components function?Can I record data and findings from an investigation?Can I investigate my results further? | **Tests including comparatives and fair tests (include recognising and controlling variables):**Investigate the relationship between wire length and the brightness of bulbs or the loudness of buzzers- comparative test and controlling variables.Investigate, present and report findings on the effect of wire length on the brightness of bulbs or the loudness of buzzers. |
| **Equipment (including thermometers and data loggers):**Electrical wires with crocodile clips, bulbs, batteries (selection with different voltages) buzzers, motors, switches, single and double battery holders. | **Recording and presenting data (scientific language, drawings, classification keys, labelled diagrams, keys, bar/line graphs, and tables):** Reporting on findings from enquiries: oral/written explanationsUsing results to: draw conclusions/make predictions/ set up further comparative tests Identifying differences, similarities or changes related to scientific ideas and processes, including causal relationships and explanation of trust in results:Using scientific evidence to answer questions or to support findings and that which refutes ideas:  |
| **Data gathering (systematic careful observation and accurate, precise recording, standard units of measure, taking repeat recordings when appropriate):**The children select measuring equipment to give the most precise results e.g. bulbs, differing voltages of batteries. During an enquiry, they make decisions e.g. whether they need to: take repeat readings (fair testing); increase the sample size of resources used e.g buzzers, bulbs and wires (pattern seeking); adjust the observation period and frequency when investigating the relationship of wire length on brightness of bulbs/ loudness of buzzers (observing over time). |
| **Other links/information:**Ignite STEAM festival |
| **Living things and their environments:**Pupils should be taught to: * describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals
* give reasons for classifying plants and animals based on specific characteristics.
 | **Questions (and different enquiries used to answer them):**Can I give reasons for classifying animals based on their similarities and differences? Can I describe how living things are classified into groups?Can I describe the characteristics of different types of animals?Can I classify a creature based on its characteristics?Can I describe and investigate helpful and harmful micro-organisms?Can I classify organisms found in my local habitat?Can I explain the classification of organisms found in my local habitat? | **Tests including comparatives and fair tests (include recognising and controlling variables):**What makes mould investigation- observation over time and comparative test comparing and controlling different variables. |
| **Equipment (including thermometers and data loggers):**Bread- for testing micro-organisms, sellable plastic bags, petri dishes, playdough for micro-organisms, access to local habitat, classification texts. | **Recording and presenting data (scientific language, drawings, classification keys, labelled diagrams, keys, bar/line graphs, and tables):** Reporting on findings from enquiries: oral/written explanationsUsing results to: draw conclusions/make predictions/ set up further comparative tests Identifying differences, similarities or changes related to scientific ideas and processes, including causal relationships and explanation of trust in results:Using scientific evidence to answer questions or to support findings and that which refutes ideas:  |
| **Data gathering (systematic careful observation and accurate, precise recording, standard units of measure, taking repeat recordings when appropriate):**During an enquiry, they make decisions e.g. whether they need to: take repeat readings of data and results (fair testing); increase the sample size (pattern seeking) when looking at micro-organisms; adjust the observation period and frequency (observing over time);  |
| **Other links/information:**Local habitat - woods behind school/playground. |
| **Light**Pupils should be taught to: * recognise that light appears to travel in straight lines
* use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye
* explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes
* use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.
 | **Questions (and different enquiries used to answer them):**Can I explain that light travels in straight lines from light sources to our eyes, and from light sources to objects and then to our eyes?Can I understand how mirrors reflect light and how they can help us see objects?Can I explain why shadows have the same shape as the object that casts them? | **Tests including comparatives and fair tests (include recognising and controlling variables):**Investigate how shadows are formed and how light affects shadows. |
| **Equipment (including thermometers and data loggers):**Modelling clay, mirrors, torches protractors, junk modelling for making a periscope.Cellophane squares. | **Recording and presenting data (scientific language, drawings, classification keys, labelled diagrams, keys, bar/line graphs, and tables):** Reporting on findings from enquiries: oral/written explanationsUsing results to: draw conclusions/make predictions/ set up further comparative tests Identifying differences, similarities or changes related to scientific ideas and processes, including causal relationships and explanation of trust in results:Using scientific evidence to answer questions or to support findings and that which refutes ideas:  |
| **Data gathering (systematic careful observation and accurate, precise recording, standard units of measure, taking repeat recordings when appropriate):**Children decide whether they need to: take repeat readings when investigating light and refraction and (fair testing); increase the sample size of resources (pattern seeking);  |
| **Other links/information:** |
| **Evolution and Inheritance:**Pupils should be taught to: * recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago
* recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents
* identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.
 | **Questions (and different enquiries used to answer them):**Can I explain the scientific concept of inheritance and identify inherited characteristic that are passed on from parent to offspring? Can I identify adaptive traits? Can I show how animals have evolved to suit their environment?Can I identify evidence for evolution from fossil records?Can I understand how human beings have evolved?Can I explain how adaptations can result in both advantages and disadvantages?  Can I explain how human intervention affects evolution. | **Tests including comparatives and fair tests (include recognising and controlling variables):**Compare the known hominins in terms of physical appearance and skeletons. |
| **Equipment (including thermometers and data loggers):**Images of fossils and replicas created from clay/plaster of paris | **Recording and presenting data (scientific language, drawings, classification keys, labelled diagrams, keys, bar/line graphs, and tables):** Reporting on findings from enquiries: oral/written explanationsUsing results to: draw conclusions/make predictions/ set up further comparative tests Identifying differences, similarities or changes related to scientific ideas and processes, including causal relationships and explanation of trust in results:Using scientific evidence to answer questions or to support findings and that which refutes ideas:  |
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| **Other links/information:** |
| **Animals (including humans):**Pupils should be taught to: * identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood
* recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function
* describe the ways in which nutrients and water are transported within animals, including humans.
 | **Questions (and different enquiries used to answer them):**Can I understand the workings of the heart? Can I explain what the circulatory system is and its main parts? Can I investigate how exercise effects the heart?Can I explain how water and nutrients are transported within the body?Can I explain the impact of drugs and alcohol on the body?Can I describe how scientific evidence highlighted the dangers of smoking? | **Tests including comparatives and fair tests (include recognising and controlling variables):****Exercise investigation-** Children take more ownership and plan their own scientific enquiries to answer questions, including recognising and controlling variables where necessary taking measurement with increasing accuracy and precision, taking repeat readings when appropriate by creating an enquiry that compares and categorises different forms of exercise and by taking accurate pulse measurements to gather data.To record data their data gathered and results of increasing complexity using classification keys, tables, scatter graphs, bar and line graphs. To report findings from enquiries, including conclusions and degree of trust in results, in written forms by reporting and presenting the findings of their enquiry.  |
| **Equipment (including thermometers and data loggers):**Laptops/computers/tablets for internet research and graphing software, squared paper. | **Recording and presenting data (scientific language, drawings, classification keys, labelled diagrams, keys, bar/line graphs, and tables):** Reporting on findings from enquiries: oral/written explanationsUsing results to: draw conclusions/make predictions/ set up further comparative tests Identifying differences, similarities or changes related to scientific ideas and processes, including causal relationships and explanation of trust in results:Using scientific evidence to answer questions or to support findings and that which refutes ideas:  |
| **Data gathering (systematic careful observation and accurate, precise recording, standard units of measure, taking repeat recordings when appropriate):**Duringan enquiry, they make decisions e.g. whether they need to: take repeat readings of heart rate during exercise investigation (fair testing); increase thesample size of children (pattern seeking); adjust the observation period and frequency (observing over time); or check further secondary sources (researching impact of diet, exercise, drugs, alcohol and smoking on body); in order to get accurate data (closer to the true value). |
| **Other links/information:**Virtual dissection for investigating the heart. |