Pudsey Bolton Royd Primary School Science Long-Term Plan

Year 6

Autumn 1	*Autumn 2*	*Spring 1*
Enquiry Questions		
Why are living things put into groups?	How have living things changed?	How can I make my circuit more powerful?
Outcomes		
Are all micro-organisms harmful? (Research) Present research as a double page spread, including conclusion on findings.	Is there a pattern between the size and shape of a bird's beak and the food it will eat? (Pattern seeking) Choose a way of recording results and write a conclusion about what it shows.	How does the voltage of the batteries in a circuit affect the volume of the buzzer? (Fair test) Full investigation with hypothesis, equipment, method, results, conclusion.
Linked Texts		
Microbes Meet the microbes My first book on microbes Plants! Explorer	Amazing evolution: The journey of life Charles Darwin: Little people, big dreams On the origin on species	Nikola Tesla: Little people, big dreams
Linked Experiences		
Overview		
In this unit, pupils will learn how life is classified into broad groups. They will look at the work of Carl Linnaeus, the man who standardised the classification process. Using complex scientific vocabulary, pupils will also discuss the limitations of other scientist's concepts of classification. Through the main enquiry type of research, pupils will explore a range of sources, both in books and online, to prove/disprove the hypothesis that all micro-organisms are harmful. They will then organise their ideas, using complex scientific vocabulary, and present their ideas to their peers, commenting on each other's findings.	In this unit, pupils will build on their knowledge of life-cycles from Year 5, understanding that living things produce offspring of a similar kind. Pupils will study the work early evolutionary scientists, including Charles Darwin, and discuss the reliability of their work, politely pointing out limitations. Building on their knowledge of fossils from Year 3, pupils will investigate how fossil records provide a glimpse of life on Earth millions of years ago. Through the main enquiry type of pattern seeking, pupils will investigate how the size and shape of a bird's beak affects its ability to eat certain foods. They will link this to the work of Charles Darwin, and consider concepts such as 'survival of the fittest' and 'adaptations lead to evolution'. Pupils will consider the best way to present their results and use their knowledge from earlier in the unit to conclude on their findings.	In this unit, pupil will build on their knowledge of electricity from Year 4. Pupils will become familiar with the common symbols used for circuit diagrams, using this to record their plans for electrical investigations. Pupils will develop their understanding of how switches work, creating their own switch and using it in their own circuits. As well as this, pupils will investigate the effect of adding and taking away components on the circuit. Finally, pupils will use their knowledge from this unit and previous units to plan and carry our their own investigation, with a full write-up as they go.
Knowledge and/or Skills Covered		
Thoughtfully select, organise and use relevant information from a range of sources to inform responses, justify their opinions, and politely point out the limitations of other people's ideas.	Thoughtfully select, organise and use relevant information from a range of sources to inform responses, justify their opinions, and politely point out the limitations of other people's ideas.	Plans scientific enquiries to answer questions of their own, linking to what they have studied, and referring to previous and future investigations Explain their choices about where, when and how to

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Start to apply vocabulary in sophisticated ways, for instance in different areas of science, or in other subjects. Organise evaluations carefully, selecting by relevance and linking to scientific knowledge.	Make links between what they see and a range of scientific content (e.g. including content from all years) Show an awareness of scientific ethics, and display a sensitivity when critiquing others	record an enquiry. Group and redraft into useful formats like tables, diagrams, flow-charts etc Draw complex graphs by hand (e.g. scatter/ line graphs)
National Curriculum Attainment Targets		
Report and present findings from enquiries, including conclusions and causal relationships in oral and written forms such as displays and other presentations, using appropriate scientific language. 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.	Explain degree of trust in results. Identify and evaluate scientific evidence (their own and others') that has been used to support or refute ideas or arguments. 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 parents. Identify how animals and plants are adapted to suit their environment in different ways and that adaption may lead to evolution.	Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in a circuit. Use recognised symbols when representing a simple circuit in a diagram. Compare and give reasons for the variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches. Plan different types of scientific enquiries to answer their own questions, including recognising and controlling variables where necessary.
Important Vocabulary		
(Micro)organism, species, microbes, phylum, order, genus, kingdom, class, family, fern, moss, flowering plant, conifers.	Evolution, natural selection, adaptation, competition, genes, DNA, chromosomes, inherit(ance), survival of the fittest, fossil records.	simple/series/parallel circuits, voltage, power, symbols

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Spring 2	*Summer 1*	*Summer 2*
Enquiry Questions		
How do we see?	What affects my heart rate?	
Outcomes		
Can you identify all the colours of light that make white light when mixed together? What colours do you get if you mix different colours of light together? (Identifying and classifying) Written prediction and conclusion for investigation.	How does my heart rate change over the day? (Observing over time)	
Linked Texts		
The speed of starlight Amazing Muslims who changed the world	Human body encyclopedia	
Linked Experiences		
Overview		
In this unit, linked to our topic on Early Islamic Civilisation, pupils will prove that light travels in straight lines using a ray box. Pupils will also demonstrate that white light is made up of a spectrum of colours. Linking to the work of Ibn Al-Haytham, the children will understand how light reflects of surfaces, enabling us to see. Pupils will also revisit their work from Year 3 on how shadows are formed, understand how the shape and position of a shadow will change throughout the day. They will apply this in a practical context. Finally, pupils will investigate the amount of light which is able to pass through different coloured, translucent plastics. They will make a reasoned prediction as well as writing a detailed evaluation, commenting on the reliability of their results and commenting on the replicability of their investigation.	During this unit, pupils will learn the scientific names for the main parts of the circulatory system. Using their knowledge of the Digestive system from Year 4, pupils will understand how water and nutrients travel to the cells of the body. Pupils will use this knowledge to answer hypothetical questions such as 'What would happen if there was no water on earth?' and 'What is more important, exercise or healthy eating. As part of this unit, pupils will also look at the effect of diet, exercise and drugs on the body, linking to their understanding of the circulatory system. As part of this, pupils will carry out an investigation, looing at how their heart rate changes throughout the day. As part of this, pupils will plot a line graph, labelling any key information on the graph.	
Knowledge and/or Skills Covered		
Predict, using evidence, and with reference to concepts like reliability, significance, replicability Make comments about reliability of results, replicability, methodology. Understand and explain why different levels of	Ask/answer perceptive questions (e.g. hypothetical, extrapolatory) Link their experience to a range of scientific content (i.e. from previous years) Use a range of presentation forms to show	

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accuracy are appropriate	discernment in selection, awareness of audience, and perceptive conclusions	
National Curriculum Attainment Targets		
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. 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. Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings where appropriate.	Identify the main parts of the 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. Use test results to make predictions to set up further comparative and fair tests.	
Important Vocabulary		
Refraction, reflection, wave, spectrum	circulatory system, blood vessels, capillaries, red/white, blood cells, plasma, haemoglobin, clotting, respiratory system, respire, carbon dioxide, (de)oxygenated, aerobic, vein/artery, gaseous exchange, drugs	