

Science Long Term Plan

Including working scientifically objectives and enquiry-based questions.



Year group		Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
R,1&2	A&B	Seasonal changes 1 (year 1) Step 1 Changes in winter Step 2 Gather and record data Plants 1 (year 1) Step 1 Plant – winter Plants (Year 2) Step 2 What do plants need to grow? Step 3 Plan - bulbs and seeds Step 4 Plant - bulbs and seeds		Seasonal changes 2 (Year 1) Step 1 Changes in spring Step 2 Collect and record data Plants 2 (year 1) Step 1 Observe changes Step 2 Plant – spring Growing up (year 2) Step 1 Butterfly diary		Seasonal changes 3 (year 1) Step 1 Changes in summer Step 2 Collect and record data Step 3 What are the main changes in each season Plants 3 (year 1) Step 1 Observe changes Step 2 Plant - summer	
1 & 2	A	Animals including (Year 1) Step 1 Identify and name parts of the human body Step 2 Draw and label parts of the human body Step 3 Sight Step 4 Sound Step 5 Taste Step 6 Touch Step 7 Smell Humans (year 2) Step 1 Exercise Step 2 Food Step 3 Hygiene Step 4 Teeth Growing up (year 2) Step 1 Parent and offspring Step 2 Life cycle of humans Step 3 Life cycles of different mammals Step 4 Life cycle of amphibians Step 5 Life cycle of a butterfly Step 6 Are there patterns between the life cycles of different animals?		Plants (Year 1) Step 1 Plant parts Step 2 Tree parts Step 3 Wild and garden plants Step 4 Plants in my local area Step 5 Deciduous trees Step 6 Evergreen trees Step 7 Trees in my local area Plants 1 (Year 2) Step 1 Findings - light and dark Plants – bulbs and seeds Step 1 Bulb or seed? Plants 2 (Year 2) Step 1 Findings - bulbs and seeds		Living things and their habitat (year 2) Step 1 Habitats in my local area Step 2 Polar habitats Step 3 Desert habitats Step 4 Ocean habitats Step 5 Woodland habitats Step 6 Microhabitats Step 7 Habitats and diet Step 8 Food chains Step 9 Living, dead or never alive? Materials (year 2) Step 1 Explore materials Step 2 Wood, paper and cardboard Step 3 Brick and rock Step 4 Glass and plastic Step 5 Metal Step 6 Fabrics Step 7 Same object, different material Step 8 Test materials - bend, squash, twist and stretch Step 9 Plan - waterproof experiment Step 10 Investigate - waterproof experiment Sustainability (plastic) (Year 2) Step 1 How is plastic helpful and harmful? Step 2 How can we reduce our plastic waste in school?	

	B	Animals including humans (year 1) Step 1 Mammals Step 2 Birds Step 3 Fish Step 4 Amphibians Step 5 Reptiles Step 6 Compare and group animals Step 7 Carnivores Step 8 Herbivores Step 9 Omnivores	Animal needs for survival (year 2) Step 1 Mammals Step 2 Birds Step 3 Fish Step 4 Amphibians Step 5 Reptiles Step 6 Humans	Sustainability (year 2) Step 1 What does wildlife do for us? Step 2 What can we do for wildlife? Materials (Year 1) Step 1 Explore materials - wood, plastic, glass and metal Step 2 Explore materials – rock Step 3 Objects and materials Step 4 Melt and freeze Step 5 Float or sink? Step 6 Does it absorb water? Step 7 Investigate materials	Growing and cooking (year 1) Step 1 Where does my food come from? Step 2 What have I planted and grown this year?	Caring for our planet (year 1) Step 1 Why is it important to care for our planet? Step 2 How can we care for our planet?
--	---	---	---	---	--	---

Lower key stage 2

3 & 4	A	Animals including humans (Y3&Y4) Skeletons (year 3) Step 1 Identify and name bones in the human body Step 2 Functions of the skeleton Step 3 Identify and name bones in a range of animals Step 4 Animals with and without a spine Step 5 Are all skeletons the same? Enquiry question How can animals be sorted and grouped based on their skeletons? Working scientifically 3	Rocks (Year 3) Identify rocks Step 1 Groups Step 2 Rocks Step 3 Test rocks Step 4 Local rock survey Enquiry question How can rocks be identified and grouped based on their properties? Working scientifically 5, 1, 6	Light (year 3) Step 1 Light sources Step 2 The Sun Step 3 How we see Step 4 Shadows Step 5 Opaque, translucent or transparent? Step 6 Plan - shadow experiment Step 7 Investigate - shadow experiment Step 8 Evaluate - shadow experiment Working scientifically – 4, 8, 7	Electricity (Year 4) Common appliances that use electricity Build and draw series circuits What has gone wrong? Conductors and insulators Conductivity within a circuit Enquiry question What materials are conductors or insulators of electricity and is there a pattern? Working scientifically, 1, 8, 12, 4	Living things (Year 4) Teeth - carnivores, herbivores and omnivores Human teeth Layers of the teeth Plan - tooth decay experiment The digestive system The digestive system - model Findings - tooth decay experiment Enquiry question What is the digestive system and how does it work? Working scientifically 7,4, 14, 11,8, 3, 12,
		Movement (year 3) Step 1 Joints Step 2 How we move Working scientifically 10	Fossils Step 1 Explore fossils Step 2 Fossil formation Enquiry question How are fossils formed? Working scientifically 4, 3			

Yellow
Year 3
objectives

Green
Year 4
objectives

		<p align="center"><u>Nutrition and diet</u> <u>(year 3)</u></p> <p>Step 1 Food groups Step 2 Understand the five food groups Step 3 Balanced diets Step 4 Compare diets Step 5 Animal diets</p> <p>Enquiry question What is a balanced diet and is it important?</p> <p>Working scientifically 1,2, 3,</p>				
	B	<p align="center"><u>Forces and magnets</u> <u>(year 3)</u></p> <p>Step 1 Explore forces Step 2 Friction Step 3 Plan - friction experiment Step 4 Investigate - friction experiment</p> <p>Working scientifically 7, 2, 11, 12, 3</p>	<p align="center"><u>Animals including (Year 4)</u></p> <p>Step 1 Group animals Step 2 vertebrates and invertebrates Step 3 Classification keys (animals) Step 4 group plants classification keys (plants)</p> <p>Enquiry question How can living things be grouped and classified?</p> <p>Working Scientifically 1, 4, 6, 3,</p>	<p align="center"><u>Sound</u> <u>(Year 4)</u></p> <p>Step 1 Vibrations Step 2 The ear Step 3 Investigate sounds Step 4 Explore volume Step 5 Explore pitch Step 6 Plan - volume experiment Step 7 Investigate - volume experiment Step 8 Evaluate – volume experiment</p> <p>Enquiry question How does the distance from the sound source affect the volume of the sound?</p> <p>Working scientifically 9, 8, 5, 11, 7, 12</p>	<p align="center"><u>Plants</u> <u>(year 3)</u></p> <p>Step 1 Parts of a plant and their functions Step 2 Plant dissection Step 3 Plan - plant growth Step 4 Plant - plant growth Step 5 The stem and water transportation Step 6 Looking at seeds Step 7 Reproductive parts in plants Step 8 Pollination Step 9 Seed dispersal Step 10 Life cycle of plants</p> <p>Enquiry question Does the number of seeds within one plant pot affect the growth of the plants?</p> <p>Working scientifically 9, 2,1,11,7, 8, 13</p>	<p align="center"><u>States of matter</u> <u>(Year 4)</u></p> <p>Explore solids, liquids and gases Think differently - solids, liquids and gases Change states Step 4 Use equipment Plan - melting experiment Investigate - melting experiment The water cycle Plan - evaporation experiment Investigate - evaporation experiment Evaluate - evaporation experiment</p> <p>Enquiry question How does the temperature of the water affect the time it takes for ice to melt?</p> <p>Working scientifically 1, 7, 9, 5, 6, 4, 12</p>
		<p align="center"><u>Magnets</u> <u>(Year 3)</u></p> <p>Step 2 Magnetic and non-magnetic materials Step 3 Investigate metals</p>	<p align="center"><u>Food chains</u> <u>(year 4)</u></p> <p>Step 1 What is a food chain? Step 2 Interpret food chains</p>		<p align="center"><u>Plants 2</u></p> <p>Step 1 plant growth</p>	

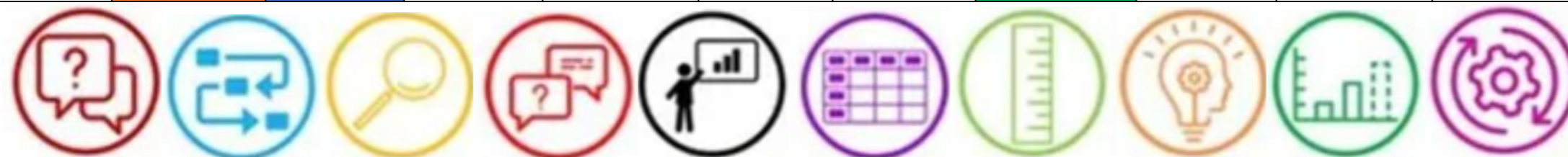
		<p>Step 4 North and South Poles attract and repel</p> <p>Working scientifically 6, 7, 11</p>	<p>Step 3 Draw food chains Step 4 What would happen if?</p> <p>Working scientifically 2,8,3</p>			
5 & 6	A	<p>Animals including human (year 5)</p> <p>Step 1 Life cycles of mammals Step 2 Life cycles of amphibians (frogs) Step 3 Life cycles of insects Step 4 Life cycles of birds</p> <p>Enquiry question</p> <ul style="list-style-type: none"> How are the life cycles of animals similar and how are they different? <p>Working scientifically 21,20, 19</p>	<p>Living things (year 5)</p> <p>Reproduction 1</p> <p>Step 1 Sexual reproduction in mammals Step 2 Reproductive parts in plants Step 3 Pollination Step 4 Asexual reproduction Step 5 Plan - cloning plants Step 6 Plant - cloning plants</p> <p>Working scientifically 21, 19, 20, 18, 23, 26,</p>	<p>Materials (year 5)</p> <p>Step 1 Dissolving Step 2 Separate materials - filtering and sieving Step 3 Solutions and evaporating Step 4 Reversible changes Step 5 Irreversible changes - burning Step 6 Irreversible changes - acid</p> <p>Enquiry question</p> <ul style="list-style-type: none"> Which material is the best insulator of heat? <p>Working scientifically 21, 29, 26, 25, 19, 30</p>	<p>Light (year 6)</p> <p>Step 1 How we see Step 2 Light and straight lines Step 3 Shadow formation Step 4 Plan shadow experiment Step 5 Investigate - shadow experiment Step 6 Evaluate - shadow experiment Step 7 Refraction Step 8 Explore light</p> <p>Enquiry question</p> <p>How does the distance from a light source affect the size of the shadow?</p> <p>Working scientifically 23, 19, 17, 26, 19, 27, 33</p>	<p>Evolution and inheritance (year 6)</p> <p>Variation</p> <p>Step 1 Variation Step 2 Inheritance and characteristics</p> <p>Working scientifically 21, 19</p>
		<p>Life Cycles (year 5)</p> <p>Step 1 The human life cycle Step 2 Babies and children Step 3 Adolescence and puberty Step 4 Adults and the elderly Step 5 Gestation periods of mammals Step 6 Gestation periods and lifespan</p> <p>Working scientifically 15, 16, 17, 18, 19, 20</p>	<p>Reproduction 2</p> <p>Step 1 Findings - clone plants Step 2 Interpret data</p> <p>Working scientifically 29,</p>	<p>Plastic pollution</p> <p>Step 1 What is plastic pollution? Step 2 What are the impacts of plastic pollution on the planet?</p> <p>Working scientifically 27,28</p>	<p>Light pollution (year 6)</p> <p>Step 1 What is light pollution? Step 2 How can we reduce light pollution?</p> <p>Working scientifically 27, 31</p>	<p>Adaptions</p> <p>Step 1 Animal adaptations Step 2 Plant adaptations Step 3 Evolution Step 4 Charles Darwin Step 5 Natural selection Step 6 Darwin's finches</p> <p>Enquiry question</p> <p>Is the type of food a bird eats related to the shape of its beak?</p> <p>Working scientifically 35, 27, 36, 31,</p>
	B	<p>Living things and their habitats (year 6)</p> <p>Step 1 Conditions for life Step 2 Group organisms Step 3 Classify animals Step 4 Classify plants Step 5 Microorganisms</p>	<p>Animals including (year 6)</p> <p>The circulatory system</p> <p>Step 1 The circulatory system Step 2 Blood Step 3 The heart Step 4 Blood flow in the heart Step 5 Oxygenated and deoxygenated blood</p>	<p>Forces and Magnets (year 5)</p> <p>Step 1 Friction Step 2 Air resistance Step 3 Plan – parachute experiment Step 4 Investigate - parachute experiment</p>	<p>Earth and space (year 5)</p> <p>Step 1 The Solar System Step 2 The planets Step 3 Modelling Step 4 Motion of the Earth and planets Step 5 The Solar System - ideas over time</p>	<p>Electricity – physics (year 6)</p> <p>Construct and draw series circuits using symbols Step 2 Complete and incomplete circuits Step 3 Variations within circuits Step 4 Plan - voltage experiment</p>











		<p>Enquiry question How can animals, plants and microorganisms be identified, grouped and classified?</p> <p>Working scientifically 18, 30, 32,31, 21</p>	<p>Step 6 Dissection of the heart</p> <p>Enquiry question What is the circulatory system and how does it work?</p> <p>Working scientifically 34, 21,</p>	<p>Step 5 Evaluate – parachute experiment Step 6 Plan - water resistance Step 7 Investigate - water resistance Step 8 Explore gravity Step 9 Use small forces for greater effects</p> <p>Enquiry question Does the size of a parachute affect the time it takes for it to fall to the ground?</p> <p>Working scientifically 21, 22 24, 25, 26, 27</p>	<p>Step 6 Planet Earth Step 7 Night and day Step 8 The Moon</p> <p>Enquiry question How have ideas about the Solar System changed over time?</p> <p>Working scientifically 28, 21, 28, 19, 20, 27</p>	<p>Step 5 Investigate - voltage experiment Step 6 Evaluate - voltage experiment</p> <p>Enquiry question How does the voltage in a circuit affect the loudness of a buzzer?</p> <p>Working scientifically 19, 25, 26, 29, 31</p>
		<p>Fossils (year 6)</p> <p>Step 1 Fossil formation Step 2 Explore fossils Step 3 Mary Anning</p> <p>Enquiry question How have fossils changed over time and does this provide evidence for evolution?</p> <p>Working scientifically 36, 27, 31,</p>	<p>Diet, drugs and lifestyle (year 6) X curricula with PSHE</p> <p>Step 1 Diet Step 2 Drugs Step 3 Cigarettes Step 4 Plan - heart rate experiment Step 5 Investigate - heart rate experiment Step 6 Evaluate - heart rate experiment</p> <p>Enquiry question How does the duration of exercise affect heart rate?</p> <p>Working scientifically 27, 35, 15, 26, 29</p>	<p>Global Warming (year 5)</p> <p>What is global warming? Step 2 What are the impacts of global warming on living things</p> <p>Working scientifically 27. 22</p>		<p>Renewable energy (year 6)</p> <p>What is renewable energy? Using renewable energy</p> <p>Working scientifically 27,28</p>

1. Talk about criteria for grouping, sorting and classifying (non-statutory).
2. using straightforward scientific evidence to answer questions or to support their findings.
3. Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions
4. Asking relevant questions and using different types of scientific enquiries to answer them.
5. Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers
6. Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions Identifying differences, similarities or changes related to simple scientific ideas and processes.
7. Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts and tables
8. Asking relevant questions and using different types of scientific enquiries to answer them.
9. Communicate their findings in ways that are appropriate for different audiences (non-statutory).
10. Setting up simple practical enquiries, comparative and fair tests.
11. Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions
12. Use relevant scientific language to discuss their ideas and communicate their findings in ways that are appropriate for different audiences (non-statutory).
13. Recognise when and how secondary sources might help them to answer questions that cannot be answered through practical investigations (non-statutory).
14. Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.
15. Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.
16. Use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas (non-statutory).

17. – Identifying scientific evidence that has been used to support or refute ideas or arguments.
18. recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.
19. Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations.
20. Use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas (non-statutory).
21. Recognise which secondary sources will be most useful to research their ideas (non-statutory).
22. – Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary
23. using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.
24. Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.
25. Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.
26. – Identifying scientific evidence that has been used to support or refute ideas or arguments.
27. Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions
28. Using test results to make predictions to set up further comparative and fair tests.
29. Use and develop keys and other information records to identify, classify and describe living things and materials (non-statutory).
30. Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations
31. Use and develop keys and other information records to identify, classify and describe living things and materials, and identify patterns that might be found in the natural environment (nonstatutory).
32. Talk about how scientific ideas have changed over time (non-statutory).
33. Explore ideas and raise different kinds of questions (non-statutory).
34. Recognise which secondary sources will be most useful to research their ideas and begin the separate opinion from fact (non-statutory).
35. Use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas and should talk about how scientific ideas have developed over time (non-statutory).

1	Animals including		plants	Materials					Seasonal changes				
2	Animals including	Living things	Plants	Materials									
3	Animals including		plants		rocks					Light	Forces and magnets		
4	Animals including	Living things				States of matter	Electricity		sound				
5	Animals including	Living things		Materials				Earth and space			Forces and magnets		
6	Animals including	Living things					Electricity			Light		Evolution and inheritance	



									
asking scientific questions	planning an enquiry	observing closely	taking measurements	getting and recoding results	presenting results	interpreting results	drawing conclusions (KS2)	making predictions (KS2)	evaluating an enquiry