



British School Al Rams (BSR)

Science

**Primary School (Key Stage 1
and Key Stage 2)
Curriculum Book**

Intent

It is our intention to recognise the importance of Science in every aspect of daily life. We give the teaching and learning of Science the prominence it requires. The Scientific area of learning is concerned with increasing pupils' knowledge and understanding of our world, and with developing skills associated with Science as a process of enquiry. We aim to develop the natural curiosity of the child, encourage respect for living organisms and the physical environment and provide opportunities for critical evaluation of evidence. We intend to build a Science curriculum which develops learning and results in the acquisition of knowledge and build a Science curriculum which, enables children to become enquiry-based learners.

Implementation

Science at BSR:

- A clear and comprehensive scheme of work in line with the National Curriculum where teaching and learning should show progression across all key stages within the strands of Science.
- Children have access to relevant scientific vocabulary in order to understand and readily apply to their written, mathematical and verbal communication of their skills.
- Children will use a range of resources to develop their knowledge and understanding that is integral to their learning and develop their understanding of working scientifically.
- Clear and comprehensive scheme of work in line with the National Curriculum where teaching and learning should plan for practical investigative opportunities within Science lessons.
- Children will reflect on previous learning and cross curricular links will be made wherever possible
- Children will be able to build on prior knowledge and link ideas together, enabling them to question and become enquiry-based learners.
- Attainment will be assessed each half term through related topic assessment tasks.
- Where applicable links to Science will be made to develop the children's topical learning.

Impact

As a result of our Science teaching you will see:

- Most children will achieve age related expectations in Science at the end of their cohort year.
- Children will retain knowledge that is pertinent to Science with a real-life context.
- Children will be able to question ideas and reflect on knowledge.
- Children will work collaboratively and practically to investigate and experiment.
- Children will be able to explain the process they have taken and be able to reason scientifically.

Grade KG2

Number of Lessons Per Week		2
Topics Covered		
Term 1	Term 2	Term 3
Our Bodies (Bodies and senses) Seasons (Understand and compare and contrast different seasons)	Everyday Materials (Sorting materials) Animals Including Humans (Differences between Humans and Animals)	Plants (What plants need to grow)
Skills Developed		
<p>With help, carry out a simple test / comparative test.</p> <p>With help, make a simple prediction or suggestion about what might happen.</p> <p>Begin to suggest some ideas e.g. choose which equipment to use, choose which materials to test from a selection.</p> <p>Talk about ways of setting up a test.</p> <p>Measure using non-standard units e.g. how many lolly sticks / cubes / handfuls, etc.</p> <p>Observe closely, using simple equipment (e.g. hand lenses, egg timers).</p> <p>Use senses to compare different textures, sounds and smells.</p> <p>Communicate their ideas to a range of audiences in a variety of ways.</p> <p>Complete a pre-constructed table / chart using picture records or simple words.</p> <p>Contribute to a class display.</p> <p>Add annotations to drawings or photographs.</p>	<p>Begin to use some simple scientific language.</p> <p>Record simple visual representations of observations made.</p> <p>Use recordings to talk about and describe what happened.</p> <p>Sequence photographs of an event / observation.</p> <p>Use recordings to talk about and describe what happened.</p> <p>Sequence photographs of an event / observation.</p> <p>Begin to use simple scientific language to talk about what they have found out or why something happened.</p>	
Assessment		
Marking of Books with What Went Well and Even Better If..... Teacher Judgement and Questioning In Lesson	End of Unit Assessments Practical Experiments Student Self Assessment and Reflection	
Home Learning		
<p>https://www.science-sparks.com/ - Science experiments to try at home.</p> <p>https://pstt.org.uk/resources/curriculum-materials/Science-Fun-at-Home - Primary Science Trust - Home learning links.</p> <p>https://www.nasa.gov/kidsclub/index.html - NASA Kids' Club NASA Kids' Club provides a plethora of space focused games, videos, images and activities to introduce and help kids learn about the world of space.</p>		
Reading List & E-books		
In Science at BSR our teachers use resources from a wide variety of texts and media so there is no set science textbook or reading list.		
Literacy & Numeracy		
<p>Spelling - Key vocabulary and scientific words.</p> <p>Writing - using the 5 question words.</p> <p>Reading - Guided Reading sessions around our topics.</p> <p>Maths - measuring plants</p> <p>Maths - counting in intervals</p>		
Useful Websites		

<https://pbskids.org/apps/play-and-learn-science-.html> - Science exploration for younger children.

<http://www.crickweb.co.uk/ks1science.html#> - Labelling body parts.

<http://www.crickweb.co.uk/ks1science.html#> - Adult and baby animals quiz.

Setting (if any)

At BSR we do not set or stream for Science. Lessons are carefully planned for all styles of learners and for the different abilities within the classroom.

Staff

Pinar Tasci, Habiba Hansrod, Samirah Sadiq, Mariam Iqbal

Grade 1

Number of Lessons Per Week		2
Topics Covered		
Term 1	Term 2	Term 3
Everyday Materials (Materials Matter & Squash, bend, twist and squeeze)	Plants (Ready, Steady, Grow) Living Things and Their Habitat (Gardens)	Animals Including Humans (Healthy Animals) Living Things and Their Habitat
Skills Developed		
<p>Carry out simple comparative tests as part of a group, following a method with some independence.</p> <p>Make a simple prediction about what might happen and try to give a vague reason (even though it might not be correct).</p> <p>With support, make suggestions on a method for setting up a simple comparative test.</p> <p>Talk about a practical way to find answers to their questions.</p> <p>Measure using non-standard and simple standard measures (e.g. cm, time) with increasing accuracy.</p> <p>Begin to make decisions about which equipment to use.</p> <p>Correctly and safely use equipment provided to make observations and/or take simple measurements.</p> <p>Record and communicate their findings in a range of ways to a variety of audiences.</p> <p>Use simple scientific language with increasing accuracy.</p>	<p>Record simple data with some accuracy to help in answering questions; - With support or using frameworks, make decisions about how to complete a variety of tables/charts (e.g. a 2 column table, tally charts, Venn diagram, pictograms, block graphs with 1:1 scale). - Present findings in a class displays. - Sequence / annotate photographs of change over time. Produced increasingly detailed drawings which are labelled / annotated. With guidance, begin to notice patterns in their data e.g. order their findings, sequence best to worst, say what happened over time, etc. Recognise if results matched predictions (say if results were what they expected).</p> <p>Use their recordings to talk about and describe what has happened. Begin to use simple scientific language to explain what they have found out.</p> <p>Give a simple, logical reason why something happened (e.g. I think ... because...).</p>	
Literacy & Numeracy		
<p align="center">Spelling - Key vocabulary and scientific words. Writing - using the 5 question words. Reading - Guided Reading sessions around our topics. Maths - measuring plants Maths - counting in intervals</p>		
Assessment		
<p>Marking of Books with What Went Well and Even Better If..... Teacher Judgement and Questioning In Lesson</p>	<p>End of Unit Assessments Practical Experiments Student Self Assessment and Reflection</p>	
Home Learning		
<p align="center">https://www.science-sparks.com/ - Science experiments to try at home. https://pstt.org.uk/resources/curriculum-materials/Science-Fun-at-Home - Primary Science Trust - Home learning links. https://www.nasa.gov/kidsclub/index.html - NASA Kids' Club NASA Kids' Club provides a plethora of space focused games, videos, images and activities to introduce and help kids learn about the world of space.</p>		
Reading List & E-books		
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Useful Websites		

<http://www.parkfieldict.co.uk/infant/a.swf> - Investigate different types of animals.
<https://pbskids.org/apps/play-and-learn-science-.html> - Science exploration for younger children.
<http://www.crickweb.co.uk/ks1science.html#> - Plant labelling.

Setting (if any)

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Staff

Thomas Graham, Melane Mostert, Rachel Ellison

Grade 2

Number of Lessons Per Week		2
Topics Covered		
Term 1	Term 2	Term 3
Animals Including Humans (Diet, Skeletons, Muscles) Forces and Magnets (Acting Forces)	Plants (Parts of a plant, Seed dispersal) Rocks (Fossils and Soil)	Light (Reflections, Shadows)
Skills Developed		
<p>Help to decide about how to set up a simple fair test and begin to recognise when a test is not fair.</p> <p>Make a prediction based on everyday experience.</p> <p>With support / as a group, set up simple practical enquiries including comparative and fair tests e.g. make a choice from a list of a things (variables) to change when conducting a fair test. (e.g. choose which magnets to compare and which method to use to test their strength).</p> <p>As a group, begin to make some decisions about the best way of answering their questions.</p> <p>Find / suggest a practical way to compare things e.g. rocks, magnets.</p> <p>Collect data from their own observations and measurements using notes / simple tables / standard units.</p> <p>Help to make some decisions about what observations to make, how long to make them for, the type of simple equipment that might be used and how to work safely.</p> <p>Make simple accurate measurements using whole number standard units, using a range of equipment.</p> <p>Gather data in a variety of ways to help in answering questions.</p> <p>Use equipment accurately to improve the detail of their measurements / observations (e.g. microscopes, measuring syringes, measuring cylinders, hand lenses).</p>	<p>Record and present findings using simple scientific language and vocabulary, including discussions, oral and written explanations, notes, annotated drawings, pictorial representations, labelled diagrams, simple tables, bar charts (using scales chosen for them), displays or presentations.</p> <p>With scaffold / support record, and present data in a variety of ways to help in answering questions.</p> <p>Communicate their findings in ways that are appropriate for different audiences.</p> <p>With scaffold / support, describe and compare the effect of different factors on something (e.g. we noticed that larger magnets are not always stronger).</p> <p>With help, look for changes and simple patterns in their observations, data, chart or graph.</p> <p>Use their results to consider whether they met their predictions.</p> <p>Use their experience and some evidence or results to draw a simple conclusion to answer their original question.</p> <p>Write a simple explanation of why things happened (using the word 'because') and using simple scientific language and vocabulary.</p> <p>Say whether what happened was what they expected and notice any results that seem odd.</p> <p>Begin to recognise when a test is not fair and suggest improvements.</p>	
Literacy & Numeracy		
<p>Writing - Accurately annotating diagrams, expanded sentences describing reasoning, .</p> <p>Reading - Guided Reading sessions around our topics.</p> <p>Maths - Using graphs, data and charts.</p> <p>Maths - Identifying patterns.</p>		
Assessment		
Marking of Books with What Went Well and Even Better If..... Teacher Judgement and Questioning In Lesson		End of Unit Assessments Practical Experiments Student Self Assessment and Reflection
Home Learning		
<p align="center">https://www.science-sparks.com/ - Science experiments to try at home.</p> <p align="center">https://pstt.org.uk/resources/curriculum-materials/Science-Fun-at-Home - Primary Science Trust - Home learning links.</p>		

<https://www.nasa.gov/kidsclub/index.html> - NASA Kids' Club NASA Kids' Club provides a plethora of space focused games, videos, images and activities to introduce and help kids learn about the world of space.

Reading List & E-books

In Science at BSR our teachers use resources from a wide variety of texts and media so there is no set science textbook or reading list.

Useful Websites

http://www.jinxthemonkey.com/drip/game_forceandmotion.swf - A bit of fun! Change the magnet between poles to speed the mouse up or slow it down to collect cheese.

<http://www.e-learningforkids.org/science/lesson/norway-plants-and-their-properties/> - Find out more about the parts of a plant.

http://www.rigb.org/insideout/anatomy/skeleton_territory/skeleton_elements.swf - This game lets you build different animal skeletons.

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Staff

Karen Page, Anya Reavley

Grade 3

Number of Lessons Per Week		2
Topics Covered		
Term 1	Term 2	Term 3
Living Things and Their Habitat (Classifying) Animals Including Humans (Digestion)	States of Matter (Solids, Liquids, Gases) Sound (Pitch, Tone, Vibration)	Electricity (Simple Circuits)
Skills Developed		
<p>Carry out simple fair tests with increasing confidence investigating the effect of something on something else.</p> <p>Start to make their own decisions about the most appropriate type of science enquiry they might use to answer scientific questions (is a fair test the best way to investigate their question?)</p> <p>Make a prediction based on the knowledge acquired from previous explorations / observations and apply it to a new situation.</p> <p>Explain their planning decisions and choices.</p> <p>Make some of the planning decisions about what to change and measure / observe.</p> <p>Begin to recognise when a fair test is necessary.</p> <p>Begin to identify where patterns might be found and use this to begin to identify what data to collect.</p> <p>Make more of the decisions about what observations to make, how long to make them for and the type of equipment that might be used.</p> <p>Recognise obvious risks and how to keep themselves and others safe.</p> <p>Learn how to use new equipment, such as data loggers and measure temperature in degrees Celsius (°C) using a thermometer.</p> <p>Collect data from their own observations and measurements, using notes / simple tables / standard units.</p> <p>Make accurate measurements using standard units [and more complex units and parts of units] using a range of equipment and scales.</p>	<p>Record findings using relevant scientific language and vocabulary, including discussions, oral and written explanations, notes, drawings (annotated), pictorial representations, labelled diagrams, tables and bar charts [where intervals and ranges agreed through discussion], displays or presentations.</p> <p>Begin to select the most useful ways to collect, record, classify and present data from a range of choices.</p> <p>Make decisions on how best to communicate their findings in ways that are appropriate for different audiences.</p> <p>Notice / find patterns in their observations and data. (Describe the effect of something on something else). (e.g. as I lengthen the ruler I notice that the pitch gets lower).</p> <p>With some independence, analyse results / observations by writing a sentence that matches the evidence i.e. deciding the important aspect of the result and summarising in a conclusion (e.g. metals tend to be good conductors of electricity).</p> <p>Begin to develop their ideas about relationships and interactions between things and explain them. Use relevant scientific language and vocabulary to begin to say / explain why something happened.</p> <p>Use results to suggest improvements, new questions and / or predictions for setting up further tests.</p> <p>Compare their results with others and give reasons why results might be different.</p>	
Literacy & Numeracy		
<p align="center">Writing - Accurately annotating diagrams, correctly draw, label and annotate scientific diagrams.</p> <p align="center">Reading - Guided Reading sessions around our topics.</p> <p align="center">Maths - Using graphs, charts and tables to draw conclusions. Independently draw and label a bar chart.</p> <p align="center">Maths - Accurately measure temperature.</p>		
Assessment		
<p>Marking of Books with What Went Well and Even Better If.....</p> <p>Teacher Judgement and Questioning In Lesson</p> <p>GL Assessment Progress Tests in Science - End of Year</p>		<p>End of Unit Assessments</p> <p>Practical Experiments</p> <p>Student Self Assessment and Reflection</p>
Home Learning		
<p align="center">https://www.science-sparks.com/ - Science experiments to try at home.</p>		

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<https://www.q-files.com/life/human-body/ear/> - This site has information about how the human ear hears sounds.
https://www3.epa.gov/safewater/kids/flash/flash_watercycle.html - This interactive activity shows each stage of the water cycle.
<http://www.learningcircuits.co.uk/flashmain.htm> - Find out about electricity basics, simple circuits and circuit diagrams by using this activity.

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Staff

Deon Mostert, Gabrielle Williams

Grade 4

Number of Lessons Per Week		2
Topics Covered		
Term 1	Term 2	Term 3
Properties And Change of Materials (Melting, Boiling) Space (Earth, Sun, Moon)	Living Things And Their Habitats (Life Cycles) Animals Including Humans (Keeping Healthy)	Forces (Air Resistance, Water Resistance, Pulleys, Gears and Levers)
Skills Developed		
<p>Carry our fair tests and other investigations with increasing independence.</p> <p>Suggest more than one possible prediction and begin to suggest which is the most likely. Justify their reason with some knowledge and understanding of the scientific concept.</p> <p>Make decisions about which variables to change, measure and keep the same.</p> <p>Make most of the planning decisions for an investigation.</p> <p>Recognise when it is appropriate to carry out a fair test.</p> <p>Make their own decisions about what observations to make or measurements to use and how long to take them for (recognising the need for repeat readings on some occasions).</p> <p>Take measurements using a range of scientific equipment with increasing accuracy and using more complex scales / units.</p> <p>Identify possible risks to themselves and others and suggest ways of reducing these.</p> <p>Choose the most appropriate equipment and make accurate measurements.</p> <p>Use their developing scientific knowledge and understanding and relevant scientific language and terminology to communicate more abstract concepts.</p>	<p>Present and explain their findings through talk, in written forms or in other ways (e.g. using technology) for a range of audiences / purposes.</p> <p>Record data and results of increasing complexity using different formats e.g. tables, annotated scientific diagrams, classification keys, graphs and models.</p> <p>Make decisions about the most appropriate way of recording data.</p> <p>Describe straightforward patterns in results linking cause and effect e.g. using er or the word 'more' (e.g. the longer, thinner shapes move through the water more quickly OR the larger the wings, the longer it takes the spinner to fall).</p> <p>Look for / notice relationships between things and begin to describe these.</p> <p>Comment on the results and whether they support the initial prediction.</p> <p>Use their scientific knowledge and understanding and appropriate scientific language and terminology to explain their findings and data and answer their initial question.</p> <p>Draw a valid conclusion (explain why it happened) based on their data and observations.</p> <p>Begin to recognise how repeated readings improve the reliability of results.</p> <p>Compare results with others and comment on how reliable they are.</p>	
Literacy & Numeracy		
<p align="center">Writing - Beginning to write scientific reports using non-fiction text features. Reading - Guided Reading sessions around our topics. Maths - Numbers to 1,000,000, using units of length, measuring time and distance.</p>		
Assessment		
<p>Marking of Books with What Went Well and Even Better If.....</p> <p>Teacher Judgement and Questioning In Lesson</p> <p>GL Assessment Progress Tests in Science - End of Year</p>	<p>End of Unit Assessments</p> <p>Practical Experiments</p> <p>Student Self Assessment and Reflection</p>	
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Reading List & E-books

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Useful Websites

<http://www.absorblearning.com/media/attachment.action?quick=9y&att=708> - This animation shows the Earth's rotation.
<http://www.sellafieldsites.com/resources/theforcefactor/index.html#home> - Find all the forces acting in different scenarios.
http://resources.hwb.wales.gov.uk/VTC/plant_repro/eng/Introduction/activity1pop.htm - Investigate the parts of a flowering plant.

Setting (if any)

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Staff

Farag Mohamed

Grade 5

Number of Lessons Per Week		2
Topics Covered		
Term 1	Term 2	Term 3
Space (Planets and The Solar System) Forces (Motion, Magnets)	Electricity and Light (Circuits) Living Things And Their Habitat (Animal Characteristics)	Animals Including Humans (Respiratory System) Revision topic
Skills Developed		
<p>Predict what a graph might look like before collecting results. Make a hypothesis where they say how one thing will affect another and give a reason for their suggestion with a developing understanding of the scientific concept.</p> <p>Identify variables to change, measure and keep the same in order for a test to be fair.</p> <p>Independently plan investigations and explain planning decisions. Decide when it is appropriate to carry out a fair test investigation, comparative test or alternative.</p> <p>Decide whether to repeat any readings and justify the reason for doing so.</p> <p>Make their own decisions about what measurements to take (and begin to identify the ranges used).</p> <p>Make, and act on, suggestions to control / reduce risks to themselves and others.</p> <p>Use equipment fit for purpose to take measurements which are increasingly accurate and precise.</p> <p>Decide the most appropriate equipment to use to collect data</p>	<p>Record data and results of increasing complexity using scientific diagrams and labels, recognised symbols, classification keys, tables, bar and line graphs, and models.</p> <p>Make decisions about how to present and explain their findings through talk, in written forms or in other ways.</p> <p>Spot unexpected results that do not fit the pattern (anomalies). Identify patterns in results collected and describe them using the change and measure variables (causal relationships) (e.g. as we increased the number of batteries the brightness the bulb increased).</p> <p>Identify evidence that refutes or supports their ideas. Independently form a conclusion which draws on the evidence from the test.</p> <p>Use scientific language and terminology (to explain why something happened).</p> <p>Be able to suggest reasons for unexpected results (anomalies). Describe how to improve planning to produce more reliable results. Say how confident they are that their results are reliable and give a reason.</p>	
Literacy & Numeracy		
<p>Writing - Create classification keys, write unaided scientific reports about a given topic.</p> <p>Reading - Guided Reading sessions around our topics. Identify famous scientists in Biography unit.</p> <p>Maths - Using appropriate measurements (length, volume, Newtons), creating and labelling line graphs.</p>		
Assessment		
<p>Marking of Books with What Went Well and Even Better If..... Teacher Judgement and Questioning In Lesson GL Assessment Progress Tests in Science - End of Year</p>	<p>End of Unit Assessments Practical Experiments Student Self Assessment and Reflection</p>	
Home Learning		
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Useful Websites

http://www.cleo.net.uk/consultants_resources/science/circuitWorld/circuitworld.html - Try to build an electrical circuit by dragging and dropping electrical symbols.

<http://splash.abc.net.au/res/i/L41/index.html> - Investigate what chemical changes you can make in an intergalactic cooking contest.

<http://www.microbiologyonline.org.uk/students/microbe-passports-1> - Look down the microscope to find out more about different microbes.

Setting (if any)

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Staff

Laura Campbell