Harry Gosling Primary School
Science Policy
2018

Aims and objectives

Science teaches an understanding of natural phenomena and encourages children to think creatively. It aims to stimulate a child's curiosity in finding out why things happen and work in the way that they do. It teaches methods of enquiry and investigation to stimulate creative thought. Children learn to ask questions and begin to appreciate the way in which science will affect the future on a personal, national and global level. In science, they are taught to 'Think Scientifically' alongside learning the knowledge skills and understanding of; Life processes and living things, physical processes and materials.

Our objectives in the teaching of science are for all children to:

- ask and answer questions;
- plan, design and carry out scientific investigations and the making of different products, with the correct use of equipment (including computers);
- know about life processes; materials, electricity, light, sound, and natural forces, the nature of the solar system, including the earth.

Planning

Years 1-6, plan science lessons which, where possible, are linked to the classes' topic of work. The national curriculum is used to ensure complete coverage of the science curriculum are being met.

The lessons to be taught are summarised on the half termly medium term planning (see Appendix 1). We have planned the topics in science so that they build on prior learning. We ensure that there are opportunities for children of all abilities to develop their skills and knowledge in each unit. We also build progression into the schemes of work, so that the children are increasingly challenged as they move up through the school. The planning is carried out in year groups and is monitored termly by the subject leaders.

In the foundation stage, science is under the area 'Understanding of the World' within the Curriculum Guidance for the Foundation Stage. These frameworks ensure continuity and progression occur, with many areas being revisited. They also ensure that all the investigative skills are systematically taught and the children apply them in different ways. Science makes a significant contribution to developing a child's knowledge and understanding of the world, e.g. through investigating what floats and what sinks when placed in water.

Teaching and learning style

We use a variety of teaching and learning styles in science lessons. Our principal aim is to develop children's knowledge, skills and understanding. Sometimes, we do this through whole-class teaching, while at other times, we engage the children in an enquiry-based research activity. We encourage the children to ask, as well as answer, questions. They have the opportunity to use a variety of data, such as statistics, graphs, pictures and photographs. They also have opportunity to examine different products, materials and tools where they would use for scientific investigations. Wherever possible, we involve the pupils in real scientific activities e.g. investigating a local environmental problem, or carrying out a practical experiment and analysing the results.

We recognise that in all classes, children have a wide range of abilities, and we ensure that we provide suitable learning opportunities for all children by matching the challenge of the task to the ability of the child. We achieve this in a variety of ways:

- setting tasks which are open-ended and can have a variety of responses;
- setting tasks of increasing difficulty (we do not expect all children to complete all tasks);
- grouping children by ability in the room, and setting different tasks for each ability group;
- providing resources of different complexity, matched to the ability of the child;
- using classroom assistants to support the work of individual children or groups of children.

At Harry Gosling school we plan science activities around 5 key types of scientific enquiry:

- Fair testing
- Research
- Identification and classification
- Observation over time
- Pattern seeking

Teachers are provided with unit overviews for each unit of work. The overviews provide ideas for carrying out different learning intentions and each unit relates to one of the 5 enquiries listed above. Where possible, each lesson should teach knowledge and understanding through working scientifically skills. For example, children learning about animal adaptation might use the working scientifically skill of identification and classification to identify different animals and classify them into different groups.

Equal Opportunities

At our school, we teach science to all children, whatever their ability and individual needs. Science forms part of the school curriculum policy to provide a broad and balanced education to all children. Through our science teaching, we provide learning opportunities that enable all pupils to make good progress. We strive hard to meet the needs of those pupils with special educational needs, those with disabilities, those with special gifts and talents, and those learning English as an additional language, and we take all reasonable steps to achieve this. For further details, see individual whole-school policies: Special Educational Needs; Disability Discrimination; Gifted and Talented Children; English as an Additional Language (EAL).

When progress falls significantly outside the expected range, the child may have special educational needs. Our assessment process looks at a range of factors – classroom organisation, teaching materials, teaching style, and differentiation – so that we can take some additional or different action to enable the child to learn more effectively. Assessment against the National Curriculum allows us to consider each child's attainment and progress against expected levels. This ensures that our teaching is matched to the child's needs.

Intervention through School Action and School Action Plus will lead to the creation of an Individual Education Plan (IEP) for children with special educational needs. The IEP may include, as appropriate, specific targets relating to science.

We enable all pupils to have access to the full range of activities involved in learning science. Where children are to participate in activities outside the classroom (a trip to a science museum, for example), we carry out a risk assessment prior to the activity to ensure that the activity is safe and appropriate for all pupils.

Role of the Co-ordinator

The Science leader has a range of responsibilities, including monitoring, supporting, liaising and organising resources. They also complete a work survey, with members of the SLT, looking at books covering a range of abilities from all classes. They may also observe some science lessons. Another part of the subject leader's roles is to support colleagues; this could include team teaching or assistance with planning. They also will lead staff meetings and suggest opportunities for colleagues. The Science leader may liaise with colleagues from other schools through borough subject leader meetings. They are also responsible for ordering new resources and enabling staff to make best use of the resources.

Resources

We have sufficient resources for all science units in the school. We keep these in a central store, where there is a box of equipment for each unit of work. The library contains a good supply of science topic books and computer software to support children's individual research.

Assessment for learning

Teachers will assess children's work in science by making informal judgements during lessons. On completion of a piece of work, the teacher assesses it, and uses this assessment to plan for future learning. Written or verbal feedback is given to the child to help guide his/her progress. Older children are encouraged to make judgements about how they can improve their own work.

Last updated: 28.9.17

Every half term, class teachers make a judgement about children's attainment and progress in science. This is recorded, monitored and analysed by the science coordinator. This information is passed on to the next teacher at the end of the year.

Teachers make an assessment of the children's work in science at the end of Key Stage 1 and Key Stage 2. We report these assessments to parents and carers.

Cross- curricular Opportunities

The school has developed links between science and other subjects in its new integrated curriculum, especially literacy, encouraging a range of writing types to be used, both non-fiction and fiction. Opportunities to teach and learn creatively are also considered where appropriate. Practical science work facilities all learners, as well promoting each pupil's personal development and a respect for the environment. Much of the science curriculum has links with other subject areas. The long term planning documents facilitates and encourages these links. For example, pupils record their findings in a variety of ways including drawing and diagrams (linking with art), written descriptions and presentations (linking with literacy), graphs and tables (linking with maths and ICT). ICT links can also be made when using the Internet and CD ROMS for research. Much excellent artwork continues to be done, showing how children can learn a lot scientifically from close observational drawing. In certain geography topics, such as rivers, weather and recycling, there are many opportunities for cross-curricular teaching through using investigational and data handling skills.

Wherever these links can be made, they enrich and broaden children's horizon.

Appendix 1

Last updated: 28.9.17

Medium Term Plan for years 1 and 2 – Science

Subject		**Teachers**		**Term**	
Topic Theme		**Year Group**		**Date**	

The following areas of knowledge, skills and understanding must be included in your planning:
When you have planned an objective into the MTP please highlight it on this table. You will then be able to see what objectives in 'working scientifically' you have covered.

	Investigative skills		
Ideas and evidence in science - **asking simple questions and recognising that they can be answered in different ways(NC).** -to use science experiences to explore the world around me. -to use practical science to raise questions about how things are similar and different. -to use practical science to raise questions about how things change and how they happen.	**Planning** - **performing simple tests(NC).** -to use practical science to begin to work with different scientific enquiries. *(research, observing over time, sorting and classifying, fair testing, pattern seeking)* -to begin to choose ways to might answer scientific questions. -to begin to make predictions. -to ask questions and use simple secondary sources (e.g. internet, CD-ROMS, books, visitors) to find answers.	**Obtaining and presenting evidence** - **observing closely, using simple equipment** - **identifying and classifying** - **using their observations and ideas to suggest answers to questions(NC).** -to make comparisons between different objects, materials and living things and begin to sort them. -to observe changes over different periods of time and talk about what has happened. -to use simple measurements and equipment (e.g. hand lenses, egg timers) to gather data. -to carry out simple tests. -to record simple data. *(bar charts / pictograms / tally chart etc.)* -to gather simple secondary sources (e.g. internet, CD-ROMS, books, visitors) to find answers	**Considering evidence and evaluating** - **using their observations and ideas to suggest answers to questions** - **gathering and recording data to help in answering questions (Year 2 only) (NC).** -to be able to notice patterns and relationships. (with help) -to record and communicate findings from relevant enquiries (including research) in a range of ways and begin to use simple scientific language. (with help)

	Learning Intention and Success Criteria- *ensure these are shared with the children. Are the steps clear so the children can be successful?*	**Activity (including differentiation)-** *Note where CT and TA will be supporting (ensure this changes daily)* *Have you planned any mini-plenaries to address misconceptions?* *Is your differentiation clear and based upon where your pupils are currently operating?* *Have you planned how you will model the activity?*	**Key Questions**-*record key questions. Are the questions differentiated to support and challenge all pupils? Have you used any open ended questions?*	**Resources**	**Cross-reference to English/ maths learning and computing objectives**
	Beginning a unit - Give the children **a science glossary** for the unit of work you are studying - Assess the children's prior knowledge. Eg, Class, group or individual mind map / KWL chart / unit test - Gather questions from the children about the unit you are covering				
Lesson1	L.I: S.C:	Introduction: Main activity: HA: MA: LA: Plenary:			
Lesson 2	L.I: S.C:	Introduction: Main activity: HA: MA: LA: Plenary:			

Lesson 3	L.I: S.C:	Introduction: Main activity: HA: MA: LA: Plenary:			
Lesson 4	L.I: S.C:	Introduction: Main activity: HA: MA: LA: Plenary:			
Lesson 5	L.I: S.C:	Introduction: Main activity: HA: MA: LA: Plenary:			

End product and evaluation of each session

Medium Term Plan for years 3 and 4 – Science

Subject		**Teachers**		**Term**	
Topic Theme		**Year Group**		**Date**	

The following areas of knowledge, skills and understanding must be included in your planning: *When you have planned an objective into the MTP please highlight it on this table. You will then be able to see what objectives in 'working scientifically' you have covered.*	
Ideas and evidence in	**Investigative skills**

<u>science</u> - **asking relevant questions and using different types of scientific enquiry to answer them** -to use practical science to ask questions about the world around me. -to decide which type of enquiry to use to answer the questions I come up with. *(research, observing over time, sorting and classifying, fair testing, pattern seeking)* -to identify when to plan and carry out a fair test.	**<u>Planning</u>** - **setting up simple practical enquiries, comparative and fair tests.** -to suggest how to plan a fair test. -to suggest criteria for grouping, sorting and classifying information. -to recognise when secondary sources of information should be used when my questions cannot be answered practically. -to make predictions.	**<u>Obtaining and presenting evidence</u>** - **asking systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, inc. thermometers and data loggers.** - **gathering, recording, classifying and presenting data in a variety of ways to help in answering questions.** - **recording findings using simple scientific language, drawings, labelled diagrams, bar charts, and tables** -to sort information into criteria that I have decided, -to identify where patterns might be found and what data to collect to identify them. -to make decisions about observations - what to make, how long to make them for and what equipment to use. (with help) -to use equipment like data loggers and microscopes. -to collect data from observations and measurements by using notes, tables and standard units. -to help make decisions on how to record and analyse this data.		**<u>Considering evidence and evaluating</u>** - **reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.** - **using results to draw simple conclusions, make predictions for new values, suggest improvements, and raise further questions.** - **identifying differences, similarities or changes related to simple scientific ideas and processes .** - **using straight forward scientific evidence to answer questions or to support their findings.** -to identify simple changes, patterns, similarities and differences in data. (with help) -to draw simple conclusions from data or relevant enquiries (including research) to answer questions. (with help) -to identify new questions arising from the data, information and research. (with help) -to find ways of making improvements -to use scientific language to discuss ideas and communicate findings.

	Learning Intention and Success Criteria- *ensure these are shared with the children. Are the steps clear so the children can be successful?*	**Activity (including differentiation)-** *Note where CT and TA will be supporting (ensure this changes daily)* *Have you planned any mini-plenaries to address misconceptions?* *Is your differentiation clear and based upon where your pupils are currently operating?* *Have you planned how you will model the activity?*	**Key Questions**-*record key questions. Are the questions differentiated to support and challenge all pupils? Have you used any open ended questions?*	**Resources**	**Cross-reference to English/ maths learning and computing objectives**

Last updated: 28.9.17

	Beginning a unit - Give the children **a science glossary** for the unit of work you are studying - Assess the children's prior knowledge. Eg, Class, group or individual mind map / KWL chart / unit test - Gather questions from the children about the unit you are covering				
Lesson 1	L.I: S.C:	Introduction: Main activity: HA: MA: LA: Plenary:			
Lesson 2	L.I: S.C:	Introduction: Main activity: HA: MA: LA: Plenary:			
Lesson 3	L.I: S.C:	Introduction: Main activity: HA: MA: LA: Plenary:			

Lesson 4	L.I: S.C:	Introduction: Main activity: HA: MA: LA: Plenary:			
Lesson 5	L.I: S.C:	Introduction: Main activity: HA: MA: LA: Plenary:			

End product and evaluation of each session

Medium Term Plan for years 5 and 6 – Science

Subject		**Teachers**		**Term**	
Topic Theme		**Year Group**		**Date**	

The following areas of knowledge, skills and understanding must be included in your planning: *When you have planned an objective into the MTP please highlight it on this table. You will then be able to see what objectives in 'working scientifically' you have covered.*	
Ideas and evidence in science - ***asking meaningful scientific***	**Investigative skills**

questions. - to use my scientific experiences to raise different kinds of questions. - to use my scientific experiences to select and plan the most appropriate line of enquiry to answer scientific questions. *(research, observing over time, sorting and classifying, fair testing, pattern seeking)* - to talk about how scientific ideas have developed over time.	**<u>Planning</u>** - **planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.** -to recognise when and how to set up fair tests and explain which variables need to be controlled and why -to use and then develop scientific keys and information records -to identify, classify and describe living things and materials, and identify patterns that might be found in the natural environment. -to recognise which secondary sources will be most useful --to research ideas and begin to separate opinion from fact. -to make predictions and hypotheses.	**<u>Obtaining and presenting evidence</u>** - **taking measurements, using a range of scientific equipment, with increasing accuracy and precision.** - **recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, bar and line graphs.** -to make decisions about what observations to make. -to make decisions about what measurements to make and how long to make them for. -to make decisions about when readings, measurements or observations need to be repeated. -to make decisions about what equipment to use to measure. -to explain how to use measuring equipment accurately. -to make decisions about how to record data and information.	**<u>Considering evidence and evaluating</u>** **- reporting and presenting findings from enquiries, including oral and written explanations of results, explanations involving causal relationships, and conclusions.** **- using test results to make predictions to set up further comparative and fair tests** **-using simple models to describe scientific ideas** **- identifying scientific evidence that has been used to support or refute ideas or arguments.** -to look for different causal relationships in data and identify evidence that refutes or supports my ideas. -to identify anomalies in results. -to use results from relevant enquiries (including research) to write conclusions and explanations -to identify when further comparative tests and observations might be needed. -to use relevant scientific language and illustrations to discuss, communicate and justify scientific ideas -to talk about how scientific ideas have developed over time.

	Learning Intention and Success Criteria- *ensure these are shared with the children. Are the steps clear so the children can be successful?*	**Activity (including differentiation)-** *Note where CT and TA will be supporting (ensure this changes daily)* *Have you planned any mini-plenaries to address misconceptions? Is your differentiation clear and based upon where your pupils are currently operating?* *Have you planned how you will model the activity?*	**Key Questions**-*record key questions. Are the questions differentiated to support and challenge all pupils? Have you used any open ended questions?*	**Resources**	**Cross-reference to English/ maths learning and computing objectives**
	Beginning a unit - Give the children **a science glossary** for the unit of work you are studying - Assess the children's prior knowledge. Eg, Class, group or individual mind map / KWL chart / unit test - Gather questions from the children about the unit you are covering				
Lesson 1	L.I: S.C:	Introduction: Main activity: HA: MA: LA: Plenary:			
Lesson 2	L.I: S.C:	Introduction: Main activity: HA: MA: LA: Plenary:			

Lesson 3	L.I: S.C:	Introduction: Main activity: HA: MA: LA: Plenary:			
Lesson 4	L.I: S.C:	Introduction: Main activity: HA: MA: LA: Plenary:			
Lesson 5	L.I: S.C:	Introduction: Main activity: HA: MA: LA: Plenary:			

End product and evaluation of each session