

Crofton Junior School



Science Policy

September 2021

Definition of Science

Science is a body of knowledge built up through experimental testing of ideas. Science is also methodology, a practical way of finding reliable answers to questions we make about the world around us.

Intent

In science, we inspire our children by giving them the opportunities to pursue their natural curiosity; promoting the experience of exploring and investigating scientific phenomena, in a range of contexts, to ensure a continually evolving knowledge and understanding of the world around them. Our children will be encouraged to ask questions, take risks, experiment, reflect, make and learn from mistakes, in a safe environment; whereby they acquire and apply core skills, which equip them for an ever-changing world. Our curriculum provides experiences where children can secure and extend their scientific knowledge and vocabulary as well as support their numeracy and literacy skills. While not all children will follow a career in science or related disciplines when they leave the school system, science literacy will influence their lives daily: for example, managing their health and understanding issues such as climate change.

Implementation

Science is taught under three domains chemistry, physics and biology, which are progressively built on through Key Stage 2 so that children can achieve depth in their learning. Science topics are linked whenever possible to our text driver and with other subject areas in order to provide meaningful links in learning across the curriculum.

Teachers have identified the specific knowledge and skills of each topic relating to the Chris Quigley milestone statements; these are mapped across the school, ensuring that knowledge builds progressively and that children develop skills systematically so that they learn more, know more & remember more. This will also ensure that scientific enquiry and topic specific vocabulary will be introduced and built upon progressively.

Tasks are selected and designed to provide appropriate challenge to all learners, in line with the school's commitment to inclusion. Within lessons, tasks are progressive to give all children an opportunity to gain knowledge, apply knowledge and makes links between knowledge, which may cross domains. Scientific enquiry skills are obtained through selected lessons where children can explore and investigate scientific phenomenon. At the end of each topic, scientific enquiry skills are reviewed so that they can be developed progressively through their Key Stage 2 journey.

Impact

Outcomes in topic books, evidence a broad and balanced science curriculum and demonstrate children's acquisition of identified key knowledge and vocabulary relating to each of the identified milestone statements and national curriculum strands.

The impact of the curriculum is monitored through a combination of discussions with pupils and staff, scrutiny of workbooks and lesson observations in order to provide a comprehensive understanding of the quality of the curriculum and highlight areas for further development.

The importance of science in the curriculum

Science stimulates, excites and satisfies pupil's curiosity about phenomena and events in the world around them. Since science links direct practical experience with ideas, it can engage learners at many levels. Scientific method is about developing and evaluating explanations through experimental evidence and modelling. This is a spur to critical and creative thought. Through science, pupils understand how major

scientific ideas contribute to technological change – impacting on industry, business and medicine and improving the quality of life. They learn to question and discuss science-based issues that may affect their own lives, the direction of society and the future of the world.

School aims:

- to stimulate and excite pupils' curiosity about changes and events in the world
- to satisfy children's curiosity with knowledge
- to engage pupils as learners at many levels through linking ideas with practical experience
- to help pupils to learn to question and discuss scientific issues that may affect their own lives
- to help pupils develop, model and evaluate explanations through scientific methods of collecting evidence using critical and creative thought
- to show pupils how major scientific ideas contribute to technological change and how these impact on improving the quality of our everyday lives

Science Curriculum

At Key Stage 2 pupils learn about a wider range of living things, materials and physical processes. They make links between ideas and explain using simple models and theories. They apply their knowledge and understanding of scientific ideas to familiar phenomena, everyday experiences as well as their personal health. They think about the effects of scientific and technological developments on the environment and in other contexts. They carry out more systematic investigations, working on their own and with others. They use a range of reference sources in their work. They talk about their work and its significance, using a wide range of scientific language, conventional diagrams, charts, graphs and computing to communicate their ideas.

Equal Opportunities

The teaching of science in our school takes consideration of our equal opportunities policy and inclusion. All children have access to the science curriculum and are expected to work and achieve to the best of their individual potential. We recognise children as individuals and base our teaching upon our knowledge of their specific needs. A range of teaching methods and resources allow children with a wide range of abilities to achieve their full potential.

Teaching and learning

All lessons have clear learning objectives (WALTs) which are shared and reviewed with the pupils effectively. All Science WALTs will be clearly ear-marked that they are 'science', Milestone 1,2,3 (M1, M2, M3) and scientific enquiry skills where applicable (SC1). Under a learning objective, a question may be used, which is closely linked to the objective, to enable all children to understand their objective and create curiosity. A variety of strategies, including questioning, discussion, concept mapping and marking and feedback, are used to assess progress in accordance of children SC1 Skills.

Science lessons are developed to inspire the pupils to experiment and investigate the world around them and to help them raise their own questions such as "Why...?", "How...?" and "What happens if...?". The set activities develop the skills of enquiry, observation, locating sources of information, selecting appropriate equipment and using it safely, measuring and checking results, making comparisons and communicating results and findings. Each lesson makes effective links with other curriculum areas and subjects, especially literacy, mathematics and computing. Activities are challenging, motivating and extend pupils' learning. Pupils have frequent opportunities to develop their skills in, and take responsibility for, planning investigative work, selecting relevant resources, making decisions about sources of information, carrying out activities safely and deciding on the best form of communicating their findings. Each lesson will provide children with an opportunity to gain basic, advancing and deep understanding of the science curriculum. Staff will use Chris Quigley questioning to support this and it will be made clear to children the level of understanding they are being challenged at.

Planning

Planning is in-line with the requirements of the National Curriculum 2014. The school places a high emphasis on the development of pupils' skills of scientific enquiry (Sc1) also known as milestones. In the substantial majority of lessons, the skills for Sc1 are taught alongside the knowledge and understanding in life processes and living things (Sc2), materials and their properties (Sc3) and physical processes (Sc4). In this way there is an equivalent emphasis on Sc1 as there is on Sc2/3/4 together.

The Contribution of Science to other Aspects of the Curriculum

The teaching of literacy, maths and computing is promoted strongly in science as part of this school's drive to raise standards.

Literacy

The pupils are encouraged to develop their skills of writing to record their planning, what they observe and what they found out. In relation to science, they should be applying their literacy skills at levels similar to those which they are using in their English work. There is a key focus on the children producing the same standard of work (including sentence structure and spelling) through all areas of the curriculum.

Maths

At both key stages the pupils are expected to use their knowledge and understanding of measurement and data handling at the appropriate standard. In science, they should be applying their maths skills at the standard similar to that which they are using in mathematics lessons.

Computing

At both key stages this involves the pupils using computing to: locate and research information (CD ROM, internet); record findings (using text, data and tables); log changes to the environment over time (sensing equipment); gain confidence in using calculators, cameras, and tape-recorder, as well as computers and other devices.

British Values

As with all areas of the curriculum, in science we have a focus on British Values. Within science this is seen as working collaboratively with others and using equipment and resources in and around school respectfully. Further to this, looking at science in the outside world may lead to field trips where we always act sensibly and politely around the local community and members of the public.

Spiritual Development

Spiritual development is encouraged through reminding pupils of the wonder of science and the effect of scientific discoveries on the modern world. Topical scientific issues are also discussed as appropriate.

Personal, Social and Health Education

Health education is taught as part of the units on ourselves, health and growing, teeth and eating, moving and growing, keeping healthy and life cycles.

The Learning Environment

Classrooms may have working walls of current science (or incorporated within their topic wall), including relevant vocabulary accessible through both classroom practice and in their books. The profile of science should reflect its place as a core subject. Resources for the unit of work being covered should be appropriately accessible. Other sources (I.E. SLS library books) of information are available.

Safe practice

Safe practice must be promoted at all times. Teachers must also take into account all relevant Health and Safety issues. Please refer to school's Health and Safety Policy and specific risk assessments.

Extra-curricular opportunities

Within school opportunities may be taken to undertake fieldwork, visits to places of scientific interest and invite visitors to school. This is a fantastic opportunity to support the children's learning within the classroom as well as increasing the WOW factor of science within the real world. Every year, we endeavour to hold a week designated to Science where the children will be engaged and inspired by a given aspect of Science.

Learning Resources

Learning resources are kept in the school resource area centrally for all members of staff to access. Relevant equipment for a lesson is taken to the class by teachers. The scheme of work covers training the pupils in the safe and considerate use of equipment and materials. They are taught not to be careless and to use consumables efficiently.

Assessment and Recording

Teachers' summative assessment of the children's SC1 skills takes place on a termly basis. As a unit of work is taught, the children are assessed against the scientific enquiry milestones. Year 3 and 4 are working towards milestones two and Year 5 and 6 working towards milestone three. With children's work presented in topic books and knowledge the teacher has gained from discussion with the child and peer to peer discussion, ongoing assessment tracking grids are completed. This gives the teacher an overall understanding of the standard for each child, directly linked to their specific end of year age related objectives. Teachers will use the information to inform future learning and as part of transition processes.

Monitoring

All teachers are responsible for monitoring standards using the scientific enquiry assessment grids. This is monitored by the Science leader and Head teacher termly. The Science leader is also responsible for the production and implementation of the action plan. The subject leader monitors the standards of the teaching and learning of science through book scrutiny, professional dialogue and pupil interviews.

Policy Review

This policy will be reviewed every two years in line with the school's policy review programme. The Headteacher is responsible for reporting to the Governors' about the quality of its implementation and its impact on standards. In the light of this, policy amendments may be made.

Signed:

Date: September 2021

Date for review: September 2023

Appendix A

Resource	Number	Resource	Number
light and seeing / electrical circuits		Living things including animals and humans	
push switch	30 x (estimation)	toothpaste	2 x tubes
wiring	assorted examples	vegetable glycerine	1 x litre bottle
wires with crocodile clips	50 x wires – PLEASE PACK AWAY FLAT!	pulse beep	1 x (batteries included but removed)
bulb holders	50 x	reaction measures	4 x
motors	25 x (estimation)	body with movable organs	1 x
bulbs	30 x (estimation)	toothbrushes	2 x
buzzers	14 x	large foam tooth with removal parts	1 x
switches	30 x (estimation)	felt heart with removal parts & labels	1 x
battery holders	numerous sizes PLENTY!	pumping heart	1 x
electricity kit	1	Ear Model	1x
block prisms	2 x packs (7 assorted shapes) 3 x boxed triangular		
colour paddles	assortment of colours		
light metre	2 x		
kaleidoscope	2 x		
torches (with batteries)	9		
silver slim line torches (with batteries)	6		
electricity kit	1 x		
1.5V Bulbs (pack of 10)			
AA Batteries (pack of 10)			
D Batteries (pack of 12)			
Understand movement, forces and magnets		Investigate materials	
magnet wands	6	soil test kit (no soil included)	1
oversized horse shoe magnets	4	fossils	2x boxes
iron filings	2 x boxes	rocks	1x box
alnico bar magnets	11 (not boxed)	fossils collection	1x box

alnico bar magnets	10 (in boxes)	sedimentary rock collection	1 x box
horse shoe magnets	15 (most de-magnetised)	metamorphic rock collection	1x box
N/S bar magnets	28 (most de-magnetised)	igneous rock collection	1x box
double magnets	9 pairs (these were donated)	mineral rock collection	1 x box
hanging weights	5 x 1kg packs	class rock set with soils	1 x tray
forces – ramp set	2 x wooden cards 2 x ramps mixture of material	coloured sand	1x bag
force meters	10 x newton/grams 6 x grams mixture of springs	mineral pack	1 x tray
angle measure	1 x	Assorted Metals	x2
magnet kit	1 x includes: horseshoe magnet iron filings bubble 2 80mm bar magnets 4 magnetic rubbed squares 3 alnico button magnets 2 alnico square bar magnets 4 plotting compasses 2 alnico bar magnets (50mm) 1 alnico horseshoe magnet 1 stomped metal disc set 2 chrome steel bar magnets (100mm) 2 x block magnets (50mm) 2 x alnico rod magnets 10 x ferrite ring magnets		
magnet field pattern window	magnets & iron filings		
Push/Pull Springs (pack of 6)	x3		
Magnetic Wands (pack of 6)	x4		
Investigate sound and hearing		Understand evolution and inheritance	
tuning forks	15 x	fossils	2x boxes
		rocks	1x box
		fossils collection	1x box
Understand the Earth's movement in space			
Geosafari Solar System	2x		

other equipment			
cylindrical measuring jugs	a range of sizes up to 1000ml	Mirrors	(pack of 30)
measuring jugs	a range of sizes up to 1000ml	Stopwatches	x9
large scientific microscope	1 x		
balloons	assortment		
rubber tubing & syringes	2 x boxes		
funnels	11 x large 3 x medium 2 x small		
viewfinders	30 - estimation		
petri dishes	30 - estimation		
thermometers	4 x large hanging 5 x small hanging 3 x digital (needs to be tested) 32 x hand held 1 x gardeners' soil 3 x forehead		
rapitest PH tester	1 x		
magnifying glasses	15 x hand held 5 x tube 2 x mini microscope 8 x magnifying set		
bug collectors	8 x		
safety glasses	4x children 2 x adults		
candles	tealights – 30 estimation 10 x church candles		
kitchen scales	4 x (need to be checked)		