

Carlton Primary School

Science Policy



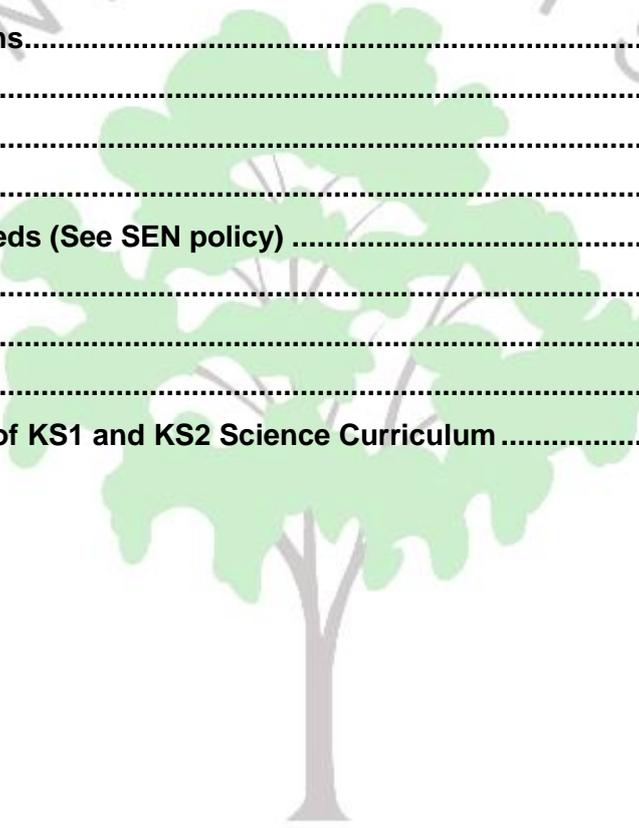
If you believe, you CAN achieve

Signed: _____

Adopted/ last reviewed by Governing Body on:	Date / Term / Year ____7 / _11 / _17____
Next revision	Tri-annual _____
To be reviewed on:	Date / Term / Year ____November 2020____

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Founded 1883

Rights Respecting School Statement for Policies

Carlton Primary School is beginning its journey as a Rights Respecting School, based upon the UNICEF Convention of the Rights of the Child. We believe that all children should grow up aware of these rights and respects these rights for themselves and for others. Being a Rights Respecting School will underpin policies throughout the school, and they will be reviewed and adapted throughout the 2017-18 academic year to demonstrate this.

Carlton Science Policy

Carlton School Vision

Our vision is that all children leave Carlton ready for the next stage in their learning and are able to make the most of the opportunities that lie ahead at secondary school and beyond.

As well as a firm foundation in reading, writing and mathematics, they will have a broad and deep knowledge and understanding of the wider curriculum.

Throughout the school, children will be confident and self-regulating, and feel able to ask questions. As learners, they will be able to evaluate and self-reflect on their own style of learning. They will be able to identify and utilise the most effective strategies that will enable them to rise to any challenge. They will not be afraid to take risks in their learning.

They will have a sense of responsibility as global citizens, and will be curious about the world around them.

Children will be physically, mentally and emotionally healthy and able to make informed choices and build positive relationships.

They will be ambitious, with an awareness of their own goals, and a strong sense of possibility, embodying the school motto: If you believe you CAN achieve.

Science Curriculum Aims

Science is a combination of a body of knowledge built up through experimental testing of ideas and methodology; a practical way of finding reliable answers to questions we may ask about the world around us. Science in our school is about developing children's ideas and ways of working that enable them to make sense of the world in which they live through investigation, as well as using and applying skills.

Our aims in teaching science include the following:

- Develop the pupils' scientific skills through first-hand experiences.
- Solve problems by making close observations, planning, predicting, experimenting, recording their findings in a systematic way, communicating, interpreting, explaining and evaluating.
- Help develop scientific knowledge in a wide range of areas to give a deeper understanding of the world.
- Foster responsible attitudes towards the environment and all living things.
- Prepare our children for life in an increasingly scientific and technological world.
- Build on our children's natural curiosity and developing a scientific approach to problems.
- Encourage open-mindedness, self-assessment, perseverance and responsibility.

- Build our children's self-confidence to enable them to work independently.
- Develop our children's social skills to work collaboratively with others.
- Provide our children with an enjoyable experience of science, so that they will develop a deep and lasting interest and may be motivated to study science further.
- Develop the use of scientific language, recording and techniques.
- Inspire children by providing opportunities to meet people with jobs in the sciences.

Teaching

From Years 1 to 6, science objectives are taken from the National Curriculum 2014. These objectives and units are organised into half termly topics for each year group. *See Appendix A for the school science curriculum overview.*

The National Curriculum requires four programmes of study to be taught during Key Stages 1 and 2.

- Scientific Enquiry
- Life and Living Processes
- Materials
- Physical Processes.

Our role is to teach scientific enquiry through the contexts of the three main content areas.

The Foundation Stage, are taught the science elements of the foundation stage document through the Early Learning Curriculum: Knowledge and Understanding of the World.

There is an emphasis in science teaching on 'working scientifically' and developing transferable skills. Working scientifically is taught through contexts taken from the knowledge objectives in the National Curriculum, as well as specific science skills lessons. A skills focus is expected in the majority of lessons, alongside the knowledge objective. Investigative skills are developed through the use of practical activities which involve planning, raising questions, predicting and hypothesising, observing and measuring, fair testing, communicating and interpreting information and results. Teachers plan the lessons for each unit to cover and build up the knowledge and understanding of each topic area; schemes of work are available for support in planning, but there is not an expectation for them to be followed.

Science is taught either as a stand-alone topic, weekly, blocked or through thematic topics in the EYFS and KS1. It is taught weekly in KS2, linking with other curriculum areas where suitable. Links are particularly encouraged with mathematics, computing, literacy, the Carlton Creative Curriculum and outdoor learning. Work is recorded in books or in the class Floor Book and marked according the school marking policy.

We expect the teaching of science to follow the school's teaching and learning principles and expectations. (see Teaching and Learning Policy)

Assessment

Aspects of science used to support teacher assessment. Teachers assess science against the National Curriculum programmes of study skills.

Science is assessed following each unit of work against the unit outcomes – this can be with an assessment activity, or in KS2, using 'Rising Stars' progress tests. There are summative tests to

provide the teachers with assessment information; misconceptions and gaps can also be assessed through concept cartoons and other start of topic activities.

At the end of each term, teachers make a judgment about each child based on the units taught so far. This should take both the subject knowledge of the topics taught and the skills relevant to the phase the class are working in. During the year, the Science Leader of Learning moderates with class teachers to ensure there is standardization across years and progress across the school. The leader helps identify gaps and supports planning to address them.

The subject folder includes documents to assist teachers in deciding whether a child is working Below/ Working Towards/Working at expected or Working at expected with Greater Depth for the subject. If children are meeting expected targets we would expect them to be Working Towards in Autumn and Spring, then reach the expected outcomes by the Summer Term.

Y2 and Y6 teachers must ensure they have 'quality' teacher assessment evidence matching the core government (at present interim) assessment statements for science across all areas for either KS2 SATs in May or external moderation.

Year 1, 3, 4 and 5 must have evidence to support the statements/PofS learning for their areas of the phase. Year 2 and Year 6 need to report at the end of the year whether each child has met the expected level of science or has not yet met the level.

Resources

There is a central resource area on the top floor; resources are stored on open shelving and are clearly labelled. The equipment is stored in broad sections; biology, chemistry and physics with topic boxes; as well as many general resources to encourage practical activities in class.

Teacher reference materials are stored on the Shared drive, under Science.

Special Educational Needs (See SEN policy)

All children are entitled to access to the National Curriculum for science at a level appropriate to their needs. Class teachers are responsible for providing differentiated work, which takes into account individual needs, builds on experiences, challenges thinking and enables learning to take place.

Children with SEN work in a variety of groupings and have access to a range of practical experiences and activities. Difficulties with literacy do not dictate the level of science work provided for children, rather, teachers take account of conceptual development and modify the presentation and recording of work to enable access to the science curriculum.

Equal Opportunities

We believe that a broad and balanced science education is the entitlement of all children, regardless of ethnic origin, gender, class, aptitude or disability.

In line with the school's equal opportunities policy, every child has access to the National Curriculum. This is ensured through appropriate planning, resourcing and grouping. Wherever possible, specific examples of scientific role models from both genders and range of cultures represented in our school are used e.g. within lessons, whole school assemblies etc.

Health and Safety

Teachers consider the safety issues that arise during a topic and report concerns or queries to the co-ordinator and head teacher. The school's Health & Safety Policy outlines the safe codes of practice for our school and provides the necessary guidance on the response and the reporting of all incidents.

Safety issues which arise during a topic are discussed with children e.g. the dangers of electricity in the house. Children are taught the appropriate safe practice when using equipment.

This includes:

- How to use equipment correctly and in accordance with health and safety guidelines.
- To behave in a considerate and responsible manner, showing respect for other people and the environment whilst on trips outside the classroom.

Copies of ASE guidance book on safety, 'Be Safe', are located in the science resource room. A Risk Assessment will be completed for any educational visit.

Role of Subject Leader

It is the role of the subject leader to :-

- Take the lead in policy development and ensure progression and continuity in Science throughout the school.
- Support colleagues in their development of topic plans and implementation of the scheme of work.
- Moderate science across the school to ensure progression and accurate assessment of children's learning.
- Monitor progress in Science and produce a termly Work Plan.
- Take responsibility for the purchase and organisation of central resources for Science.
- Attend the Science Cluster meetings with Wellcome Trust and Camden and feedback any new initiatives and policy.
- Liaise with staff to organise events for children and develop subject leadership eg CPD opportunities, specialist teaching in school, workshops.
- Keep up-to-date with developments in Science education and disseminate relevant information to staff.
- Produce a report to Governors at the end of each school year.

Updated: March 2017

Review :

Appendix A: Summary of KS1 and KS2 Science Curriculum

Year Group	Working Scientifically Ongoing	Living Things	Animals	Materials	Plants	Light and sound	Forces and Electricity
Y1 ongoing		<u>Seasonal Changes</u> ~ observe changes across the seasons ~ describe weather and day length					
Y1	~ practical scientific methods, processes and skills ~ simple questions ~ observe and use equipment ~ simple tests ~ identify and classify		<u>Animals including Humans Au</u> ~ identify and name animal groups ~ carnivores, herbivores and omnivores ~ structure of animals ~ identify, name, draw and label humans - senses	<u>Everyday Materials Sp</u> ~ object and material ~ name materials ~ physical properties ~ compare and group materials	<u>Plants Su</u> ~ identify and name plants inc deciduous and evergreen ~ identify and describe structure and variety of flowering plants inc trees		<u>Seasonal Changes Long</u> ~ observe changes across the seasons ~ describe weather and day length (Look in summer terms at patterns identified across the year.)
Y2	~ suggest answers ~ data	<u>Living Things and Habitats Au 2</u> ~ living, dead and never lived ~ habitats, diff habitats provide basic needs for diff animals and plants and they are dependant ~ identify plants and animals inc micro-habitats ~ food, food chains and food sources	<u>Animals including Humans Au 1</u> ~ offspring – adults ~ basic needs ~ exercise, healthy eating and hygiene	<u>Everyday Materials Sp</u> ~ suitability of materials ~ how solid objects can be changed by squashing, bending, twisting and stretching	<u>Plants Su</u> ~ observe and describe seeds and bulbs – mature plants ~ find out what plants need to grow		
		In both year 1 and 2 – living things and plants topics to be repeated and looked at throughout the year- longitudinal study (farm / edible playground?) in greater depth, without dipping into ks2 curriculum (look at the working scientifically – this is how you can extend) (Non-statutory in brackets)					

NB ~ local environment should be used whenever possible ~ Ongoing – changes over time/seasons							
Year Group	Working Scientifically Ongoing	Living Things	Animals	Materials	Plants	Light and sound	Forces and Electricity
Y3	<p>~ ask relevant questions</p> <p>~ use scientific enquiries</p> <p>~ practical enquiries, comparative and fair tests</p> <p>~ systematic observations, measurements, equipment – data loggers and thermometers</p> <p>~ gather, record, classify and present data to answer questions</p> <p>~ scientific language, drawings, keys, charts, tables</p> <p>~ report on findings</p> <p>~ draw conclusions, predict, suggest improvements and raise questions</p> <p>~ sims, diffs and changes</p> <p>~ evidence</p>		<p><u>Animals including Humans Au 1</u></p> <p>~ animals need nutrition, cannot make food, get nutrition from eating</p> <p>~ skeletons and muscles – support, protection and movement</p> <p>~ types and functions of teeth</p>	<p><u>Rocks Sp1</u></p> <p>~ compare and group rocks</p> <p>~ fossils</p> <p>~ soils are made from rocks and organic matter</p> <p>(Link to geography work – explore rocks and soils in environment)</p>	<p><u>Plants Sp2 Su1</u></p> <p>~ identify and describe functions of parts of flowering plants</p> <p>~ requirements of different plants</p> <p>~ investigate water transportation</p> <p>~ explore life cycle inc pollination and seed dispersal</p>	<p><u>Light Su2</u></p> <p>~ we need light to see, darkness</p> <p>~ light is reflected</p> <p>~ sunlight is dangerous</p> <p>~ shadows form where light is blocked</p> <p>~ size of shadows/patterns</p>	<p><u>Forces and Magnets Au 2</u></p> <p>~ how things move</p> <p>~ some forces need contact but magnetic forces don't</p> <p>~ magnets attract/ repel each other and attract some materials</p> <p>~ magnetic materials</p> <p>~ magnetic poles</p> <p>~ predict attract or repel</p>
Y4			<p><u>Animals including Humans Au 1</u></p> <p>~ functions of the digestive system</p> <p>~ food chains, producers, predators and prey</p>	<p><u>States of Matter Au 2</u></p> <p>~ solid, liquid or gas</p> <p>compare and group</p> <p>~ change of state when heated or cooled-temperature</p> <p>~ the water cycle, evaporation and condensation Su2</p> <p>(avoid chemical changes e.g. baking or burning)</p>	<p><u>Living Things and Habitats Su1</u></p> <p>~ living things can be grouped</p> <p>~ Classification</p> <p>~ environmental changes and its dangers to living things</p>	<p><u>Sound Sp2</u></p> <p>~ how sounds are made</p> <p>~ vibrations travel through a medium to the ear</p> <p>~ pattern between pitch and the object producing the sound</p> <p>~ patterns between volume and strength of vibrations</p> <p>~ sounds get fainter as distance increases</p>	<p><u>Electricity Sp1</u></p> <p>~ appliances that run on electricity</p> <p>~ simple circuits and part names</p> <p>~ whether a lamp will light based on circuit</p> <p>~ switches</p> <p>~ conductors and insulators</p>
(Non-statutory in brackets)							
NB ~ local environment should be used whenever possible ~ Ongoing – changes over time/seasons							

Year Group	Working Scientifically Ongoing	Living Things	Animals	Materials	Plants	Light and Sound	Forces and Electricity
	~ diff scientific enquiries ~ ans questions ~ recognise and control variables ~ measurements, accuracy and precision, repeat readings ~ record data and results, use diagrams, labels, keys, tables, scatter graphs, bar and line ~ use test results to predict, set up comparative and fair tests						
Y5 Y6 Year 2 of 2 year cycle (16/17)	~ report and present findings ~ conclude and explain ~ scientific evidence, ideas and arguments		<u>Animals including Humans</u> Su2 ~ changes to old age (growth, development and puberty)	<u>Properties and changes of materials</u> Au ~ properties inc hardness, solubility, transparency, conductivity, magnets ~ dissolve – solution and recover ~ solids, liquids and gas mixtures – separation, filtering, sieving and evaporation ~ fair test of materials ~ reversible changes ~ non-reversible changes- burning	<u>Living Things and Habitats</u> Su1 ~ different life cycles ~ reproduction in some plants and animals	<u>Earth and Space</u> Sp2 ~ movement of Earth and planets, Sun and solar system ~ movement of the moon ~ Sun, Earth and Moon are spherical ~ Earth's rotation – day and night and apparent movement of the sun	<u>Forces</u> Sp1 ~ objects fall towards the Earth because of gravity ~ air resistance, water resistance and friction ~ mechanisms allow smaller forces to have a greater effect e.g. levers, pulleys and gears
Y6 <i>2017/18</i>		<i>Evolution</i> ~ living things have changed over time ~ living things produce offspring ~ animals and plants adapt to their environment and may lead to evolution	<i>Animals including Humans</i> ~ name main parts of circulatory system ~ diet, exercise and drugs ~ nutrients and water	<i>Materials revision</i> ~ reversible changes ~ water cycle ~ dissolving (+ materials that do not) ~ solids, liquids and gas mixtures – separation, filtering, sieving and evaporation ~ non-reversible changes (inc burning)	<i>Living Things and Habitats</i> ~ How living things are classified, inc micro-organisms ~ Give reasons based on characteristics	<i>Light</i> ~ light appears to travel in straight lines ~ light reflects into our eyes off objects ~ light travels from a source to our eyes ~ light travels in straight lines to form a shadow in the shape of the object	<i>Electricity</i> ~ brightness and volume linked to voltage ~ compare and reason how components function – switches ~ symbols in a circuit diagram
		<i>(Non-statutory in brackets)</i> <i>NB ~ local environment should be used whenever possible ~ Ongoing – changes over time/seasons</i>					