

Practice Guidance for Science

Why is Science important to the children in our school?

At Cavendish Close Infant and Nursery School, we believe a high-quality science education provides the foundations for understanding the world through the specific disciplines of biology, chemistry and physics. Science has changed our lives and is vital to the world's future prosperity, and all pupils should be taught essential aspects of the knowledge, methods, processes and uses of science. Through building up a body of key foundational knowledge and concepts, pupils should be encouraged to recognise the power of rational explanation and develop a sense of excitement and curiosity about natural phenomena. They should be encouraged to understand how science can be used to explain what is occurring, predict how things will behave, and analyse causes.

What is Science?

Science is the curiosity of what is all around us (Reach Out Reporter). It is the pursuit and application of knowledge and understanding of the natural and social world. Children will develop **scientific knowledge and conceptual understanding** through the specific disciplines of biology, chemistry and physics. They will develop understanding of the **nature, processes and methods of science** through different types of science enquiries that help them to answer scientific questions about the world around them. They will become equipped with the scientific knowledge required to understand the **uses and implications** of science, today and for the future (Explorify).

Our approach to planning Science:

Science is planned in year groups. Topics are devised and taught through cross-curricular activities following EYFS and National Curriculum guidelines as set out in our Science long term planning document. Our medium-term topic planning outlines Science objectives and activities which are planned in more detail as part of weekly planning. The cross-curricular approach encourages our children to build upon prior learning and further extend and deepen understanding, through making meaningful connections in other areas of learning. This approach allows children to gain knowledge and conceptual understanding. This provides the children with knowledge that underpins deeper learning through 'hands on' experiments. Science is taught using a Mastery approach whereby children should not be limited to reach a certain level in learning. Challenge is provided through the planning of 'Earth, Moon and Stars' activities to allow children to show greater depth in their learning and with all children being encouraged to 'reach for the stars'. Challenge is provided through the planning of 'Earth, Moon and Stars' activities to allow all children the opportunity to 'reach for the stars' (Greater Depth learning). The activities are not based around the 'recording' of the activity, they are engineered to enable all children to showcase their understanding of the science behind the activity. Thus ensuring all children regardless of their written ability can achieve within the science curriculum.

Essential resources for Science:

The school has a science store which offers a plethora of resources which is updated regularly to support in the learning of science. Nursery and EYFS have outdoor areas which are accessed daily to aid the children in exploring the world around them. The school grounds offer a variety of different species of trees and hedgerow which have been identified and have been annotated in a useful map of the grounds with the corresponding tree. This is an essential resource for our children to learn through enquiry based learning. Practical resources make learning fun, exciting, challenging and more accessible to all children to ensure all children reach their full potential.

To ensure our children have the opportunity to learn science through exploration and enquiry based learning, we will be providing an outdoor 'Discovery Zone' which will encourage all our learners to be curious scientists. In all the classrooms we have 'Investigation Stations' which allow our children to explore the world around them through access to simple equipment, information books and rich vocabulary. All year groups have a bank of high quality texts to support the children's learning.

Our approach to teaching and learning in Science:

Science in the Early Years Foundation Stage is where the children will gain the basic knowledge that they will build on throughout their primary school years. In the EYFS, children will begin to use skills such as; asking questions, observation, prediction, critical thinking and discussion.

The statutory guidance alongside the Development Matters document provides practitioners with support to guide children to make sense of their physical world and their community through opportunities to explore, observe and find out about people, places, technology and the environment. Children observe their own environment, the outdoor environment, animals, growth and decay, patterns and change over time (then progressing into the 5 method types for 'working scientifically in KS1). Children are encouraged to discuss what they have observed and make links between what they have seen and what they have experienced. Furthermore, opportunities for playing and exploring, active learning and creating and thinking critically are planned, therefore enhancing their characteristics of effective learning and so becoming curious, independent, confident learners.

The principal focus of science teaching in Key Stage 1 is to enable pupils to experience and observe phenomena, looking more closely at the natural and humanly-constructed world around them. They should be encouraged to be curious and ask questions about what they notice. Children are helped to develop their understanding of scientific ideas by using different types of scientific enquiry to answer their own questions, including observing changes over a period of time, noticing patterns, grouping and classifying things, carrying out simple comparative tests, and finding things out using secondary sources of information. The children begin to use simple scientific language to talk about what they have found out and communicate their ideas to a range of audiences in a variety of ways. Most of the learning about science is done through the use of first-hand practical experiences, but we also use some of the appropriate secondary sources, such as books, photographs and videos and approved websites (such as; Reach Out Reporter and Explorify).

In accordance with the National Curriculum 'Working scientifically' is **always** taught throughout the programme of study and is clearly related to the teaching of substantive science content. Examples in the National Curriculum show how scientific methods and skills might be linked to specific elements of the

content. Pupils are expected to read and spell scientific vocabulary at a level consistent with their increasing word reading and spelling knowledge at Key Stage 1.

Working Scientifically – Statutory

During years 1 and 2, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:

- asking simple questions and recognising that they can be answered in different ways
- observing closely, using simple equipment
- performing simple tests
- identifying and classifying
- using their observations and ideas to suggest answers to questions
- gathering and recording data to help in answering questions.

The table below shows the programme of study for Year 1 and Year 2;

| Programme of Study Year 1 | Programme of Study Year 2 |
|--|--|
| <ul style="list-style-type: none">• Plants• Animals, including humans• Everyday Materials• Seasonal Changes | <ul style="list-style-type: none">• Living things and their habitats• Plants• Animals, including humans• Uses of everyday materials |

In all key stages we participate in ‘Citizenship Science’ whereby children are encouraged to engage in ‘real world’ science projects that connect to everyday living for example; The RSPB Big Garden Birdwatch.

For a more comprehensive breakdown (i.e. Statutory and non-statutory guidance please refer to the National Curriculum).

Science in the learning environment:

Explorify and Reach Out Reporter are resources that can be found on the internet which provide our children with access to stunning videos, news reports and images to expose and equip our children ‘with the knowledge and cultural capital they need to succeed in life’. This is ‘essential knowledge that pupils need to be educated citizens’ (Ofsted 2019). The use of these resources is encouraged and the expectation is that children are exposed to both Explorify and Reach Out Reporter weekly. Teachers are expected to annotate this on planning and this must be evidenced termly by the children.

Science is a key part of our EYFS provision with children being encouraged to examine, explore and understand the world around them.

In Key Stage 1, the teaching and learning of science is incorporated in all classroom environments through engaging displays, displayed vocabulary and topic based continuous provision. Children's achievements are celebrated through displays of their work which are regularly updated.

Science is recorded and evidenced in the children's 'Special Writing' book through cross curricular learning and where appropriate floor books are produced.

Our approach to assessment in Science:

Science is taught and assessed using a 'Mastery Approach' with a 'Learning Without Limits' strategy. In accordance with the school's approach to planning 'Earth, Moon and Stars' activities, children are encouraged to self and peer-assess their work to enable them to take an active role in developing their work further.

Assessment in the EYFS is in the form of continual Natural, Independent, Consistent, Embedded (N.I.C.E) observations. EYFS staff moderate judgements using their professional knowledge of the whole child.

In Key Stage 1, assessments are completed in accordance with the assessment descriptors, through class teacher judgements and through class teacher moderation. Assessments are made termly and children are judged to be 'Working Towards, Expected Standard or Greater Depth'.

The data is collated and monitored by the Science Co-ordinator.

Intervention in Science:

At present specific intervention provisions are not explicitly provided to the children as science follows the 'Mastery Approach' which all children access and achieve in. However, children are appropriately supported by staff therefore, immediate intervention would happen during lessons if a child was finding an aspect of science difficult.

Science across the curriculum:

Science is taught through a stimulating and exciting approach providing relevant links to other subjects in order to engage and motivate children. Homework is provided to deepen knowledge, skills and understanding.

Enrichment opportunities in Science:

At Cavendish Close Infant School we welcome and have regular visits from a variety of external agencies who deliver exciting whole school assemblies and workshops for the children in our school.

Science References:

Department for Education. (2012) *Development Matters in the Early Years Foundation Stage (EYFS)*. [Online]. Available at: <https://www.foundationyears.org.uk/wp-content/uploads/2012/03/Development-Matters-FINAL-PRINT-AMENDED.pdf>

Department for Education. (2014) *National Curriculum in England*. [Online]. Available at:
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/425601/PRI_MARY_national_curriculum.pdf

Ofsted. (2019) Education Inspection Framework. [Online]. Available at:
<https://www.gov.uk/government/publications/education-inspection-framework>

Science Appendices:

Appendix 1
Reach Out Reporter recording sheet (KS1)

Appendix 2
Science Assessment recording sheet (KS1)

This Practice Guidance was created by:

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Appendix 1



WALT: Understand about the big world of science.

We have watched Reachout reporter today as part of our science lesson to help us learn about what is happening in science around the world.

Which was your favourite report?

Why did you like that discovery the most?

Draw a picture of your favourite science report from Reachout Reporter.

Appendix 2

| Science Assessment | Context of Class | | | | | | |
|--------------------|------------------|------|------|-----------------|------|-------|-------|
| | PP | PP+ | SEND | SEND monitoring | EAL | f | m |
| Autumn (AP1) | 8/28 | 0/28 | 8/28 | 2/28 | 2/28 | 14/28 | 14/28 |
| Class 6 | 29% | 0% | 29% | 7% | 7% | 50% | 50% |

| 1 | Year 1 | | | Comments | Year 2 | | | Comments |
|---------|--------|-----|-----|----------|--------|-----|-----|----------|
| | WTS | EXS | GDS | | WTS | EXS | GDS | |
| Science | | | | | | | | |

| | WTS | EXS | GDS | SEND | WTS | EXS | GDS | PP | WTS | EXS | GDS |
|--------------------|------|-------|------|------|------|------|------|----|------|------|------|
| Number of Children | 4/28 | 20/28 | 4/28 | | 3/28 | 5/28 | 0/28 | | 3/28 | 5/28 | 0/28 |
| Percentage | 14% | 72% | 14% | | 11% | 19% | 0% | | 11% | 19% | 0% |