St. Wilfrid's CE Primary School

Science

Next Review: Spring 2023

Science is a core subject and is taught throughout the school. The school feels that science can often be taught in a cross curricular manner, often combining with language, mathematics and technology. Science is taught within a unit framework.

Using scientific language and equipment, the children are taught to observe, hypothesise, experiment, record data in a variety of ways, review and, where appropriate, relate the findings to their experiences in the real world. Gradually they are encouraged to devise their own experiments, taking into account the need for fair testing. Open-ended experiments are used where appropriate. Equal attention is given to the scientific process and to the progressive building of knowledge and understanding.

Equal Opportunities

The school Governing Body have accepted the LEA policy on Equal Opportunities.

Management and Role of Co-ordinator

The school has a collegiate approach to all planning. Reciprocal support is provided by the Key Stage Co-ordinator and also by the Head. The subject co-ordinator is given time annually to monitor the running of the school policy.

The role of the subject co-ordinator, however, is to take a lead in assisting and supporting their colleagues in delivering their particular subject area.

The specific roles are: -

- To receive and disseminate documentation
- To encourage and support the professional development of all the teaching staff
- To support and liase with the Key Stage Co-ordinator in the planning of the school's delivery of science within the National Curriculum (NC)– this will include a responsibility for co-ordinating the productions of the school's Statement of Policy
- To oversee the coverage and appropriate differentiation of science
- To request the necessary resources for science
- To oversee the agreed recording and assessment of science
- To oversee moderation of standards for science in terms of the Attainment Targets within the NC, including the creation of agreed portfolios
- To support staff in terms of required knowledge for the teaching of science, including problems and investigations
- To support staff with the use of ICT and relevant resources

Purposes of Learning

In general, the school endeavours to: -

- Give opportunities for first-hand experience of learning scientific knowledge, skills, principles and vocabulary according to the requirements of the NC

- Enable children to understand scientific principles
- Develop and investigative and enquiring attitude towards both prescriptive and open-ended practical investigations, using both primary and secondary sources and gain the ability to recall and apply the knowledge and skills in familiar and unfamiliar situations
- Enable children to enjoy and appreciate the relevance of scientific learning in the context of a wide body of knowledge and skills within their everyday environment and life
- Appreciate the importance of scientific discovery, both past and present, in improving the quality of life for the individual and communities
- Evaluate the implications of scientific innovations, both past and present, on the environment

Teacher Planning

Early Years Foundation Stage

Science is split into four main areas for assessment which are:-

Exploration and investigation (AT1)
Life processes and living things
Materials and their properties
Physical processes

All Science work is taught through topics and gives children a basic understanding of scientific ideas. The following areas are covered and contain a broad balance of skills and knowledge: -

Early Years Topics – Understanding of the world – The World

My Body - A1 Life processes and living things
Toys - A2 Physical - forces and motions (push and pull)
Food- SP1 Changing materials – variation and classification
Growing- SP2 Life processes and living things
Animals- SU1 Humans and other animals/Life processes
At Home & Far Away- SU2 Materials and their properties

Children will take part in activities that encourage them to look closely at the similarities, difference, patterns and change in things from both the natural man-made worlds.

National Curriculum Key Stages One and Two

From September 2014, Science will be taught based on the New National Curriculum Framework.
All Science planning is separated into scientific units – e.g. Everyday materials (Year One), Earth and Space (Year Five). Each unit relates to the NC. Each section has a broad balance of skills and knowledge.

- All areas of science are taught – biology, physics and chemistry
- Personal health and hygiene are of paramount importance
- All experiments should be checked for safety and accuracy

- The need to confirm the results of experiments by repetition is understood

Teachers will also teach Science by giving information and knowledge and also by allowing independent research.

Both KS1 and KS2 will emphasise aspects of knowledge and understanding following statutory requirements as published in the National Curriculum framework in the following areas.

KS1:
- Working scientifically
- Plants
- Animals, including humans
- Everyday materials
- Seasonal changes
- Living things and their habitats

LKS2:
- Working scientifically
- Plants
- Animals, including humans
- Rocks
- Light
- Forces and magnets
- Living things and their habitats
- States of matter
- Sound
- Electricity

UKS2:
- Working scientifically
- Living things and their habitats
- Animals, including humans
- Properties and changes of materials
- Earth and space
- Forces
- Evolution and inheritance
- Light
- Electricity

Classroom Delivery

Early Years Foundation Stage

All experiments are delivered in a variety of ways. Children may work as a whole class, in small groups, or individually as appropriate.

The delivery of lessons encourages children to make predictions, ask questions about why things happen and how things work. They try to suggest their own explanations.

Throughout their studies, children will be assisted in their understanding of cause and effect by trying things out.

National Curriculum Experimental Work KS1 and KS2

All experiments are planned and tested and may be delivered as a whole class, in small groups or individually as appropriate. Generally, it is considered better for the children to be working in groups of similar ability; however mixed ability groupings can be useful when assessing ability to design open-ended experiments.

In the classroom the teacher seeks to: -

- Be aware of the children's previous experience
- Set up experiments or create an environment for experimentation
- Step in appropriately giving hints
- Demonstrate if appropriate
- Assess specific aspects of the experiments

The children in KS1 experience a range of different styles of experiments and they should learn through: -

- Observing human, animal and plant experiments
- Questioning, hypothesising and investigating their own simple experiments
- Measuring by appropriate means
- Recording by appropriate means
- Needing to recall previous knowledge and understanding
- Appreciate the need for simple fair testing

The children in KS2 experience a range of different styles of experiments and they should learn through: -

- Observing and hypothesising using previous knowledge and experience
- Choosing relevant and available equipment
- Understanding fair testing and isolating variables
- Understanding that some experiments are open ended and may have unexpected results and therefore, by nature, nay not reach a satisfactory conclusion
- Measuring by appropriate means
- Recording by appropriate means, applying a range of different methods, using graphs and covering the following headings:

  E.g. Equipment - what we used
  Prediction/Hypothesis - what we thought would happen
  Method – what we did
  Observations/Results – what we observed
  Conclusions - what we found out
- Considering the evidence to help show scientific principles and generalisations.

Resources

The classes are resourced for appropriate experiments. There is a list of resources and where they are kept in each classroom, with a master copy being kept in the Science Cupboard between year two and year 3.

Teachers keep most resources in their classrooms, although some resources are stored in the Science cupboard (between year two and year three) or in the storeroom. Annually, staff are given an opportunity to order new resources, budget allowing.

Assessment and Recording

With the introduction of the New National Curriculum in September 2014, the assessment of Science will be reviewed throughout the year based on experiences through the implementation of the curriculum and further information and resources which come available.

Early Years Foundation Stage

The teacher assesses: -

- Scientific, experimental and investigative skills
- Scientific knowledge

Recording for these two areas is ongoing throughout the year, tracking achievement of Early Learning Goals (ELGs) and general observations which are noted. Details are found in the Early Years Profile under Understanding of the World.

Scientific, Experimental and Investigative Skills

When children are carrying out an experiment, the teacher will assess the skills of: -

- Prediction
- Observation
- Questioning

Scientific Knowledge

During the year, the teacher is required to assess knowledge and details are found in the policy of the Early Years. This covers: -

- Growing
- Life cycles
- Human body
- Sorting materials
- Changing materials
- Magnets

National Curriculum Key Stages One and Two

Experimental and Investigative Skills – *'AT1'*

When children are carrying out an experiment, teachers are required to educate pupils in using the following sections. However, teachers are advised only to assess two of the eight sections at a time. The eight sections are: -

- Predicting
- Measuring
- Planning
- Fair testing
- Observing
- Recording
- Interpreting
- Working Systematically

Teachers may also be helped in their assessment by looking at the lists found in the Classroom Delivery section of this document.

Scientific Knowledge *'AT2,3,4'* - National Curriculum Levels

The teacher assess: -

- Scientific, experimental and investigative skills
- Scientific knowledge

During the year, teachers are required to assess knowledge and record it on the assessment sheet shown in Appendix A. This should be done through identifying those pupils who are working towards, working at or working beyond expectations. The staff should continually assess the children's knowledge through discussion and by observation and short tests. Once yearly, teachers are required to give each child a National Curriculum level using the Attainment Targets sub-levels, and mini-levels. These are given to the Head Teacher. These levels can also be recorded on Appendix A.

Assessments will be passed onto the next class teacher to inform their planning.

Special Needs and Differentiation

Children are encouraged to work at the appropriate level according to the NC. It is not implicit that a low ability in reading and writing means a low ability in scientific learning and knowledge. The staff are aware it is necessary to consider a child's ability purely in terms of Science. Photographs can be used for recording and assessment in these cases.

Differentiation will often be by expectation rather than by task. However, teachers are aware that if groups are organised by ability, it is easier to differentiate the initial expectations – for examples the accuracy of measuring or the system of recording data etc.

Any difficulties arising throughout the year will be recorded on Appendix A, in the comments section as appropriate, so the next teacher will be informed.

Monitoring and Setting Standards

The co-ordinator, together with the curriculum co-ordinator, the Head Teacher and the Governors, has responsibility for monitoring standards of Science across the School.

In Science the following systems are usually in place for the co-ordinator to monitor standards annually: -

- Working with children from different classes once a year as time allows
- Reviewing various experiments and topics from each Key Stage, discussing them with three children of differing abilities, according to NC levels
- Collecting recorded data and experimental reports from three children, of differing abilities, each class specifically to consider knowledge and understanding levels

The co-ordinator will outline a timetable of monitoring each year as part of the School Improvement Plan (SIP). The co-ordinator will retain the experiments and some other work, as appropriate, and place them in the Science Portfolio. The co-ordinator will report back to staff generally and individually, detailing where improvements can be made.

Evaluation

The school evaluates Science by: -

- Keeping a portfolio of samples of work
- Reviewing topics and considering current children's needs
- Monitoring assessment results
- Keeping a class assessment record sheets of each child's NC level
- Staff meetings – formal and informal
- Staff consultations at the end of the school year

Safety Advice

Teachers need to be aware of working safely in Science and educating pupils to work and conduct experiments in a safe manner.

Precautions should be taken to ensure the safety of both pupils and adults as appropriate during all experiments. For example, through the wearing of safety goggles, over shirts or safety gloves.

The teacher is the person who has responsibility for safety matters.

Teachers must ensure that he/she is present whenever a Science experiment is being carried out. This may be the teacher simply being in the room, or it may be a parent who has been made aware of the potential dangers.

Students need to be directly advised and supervised by the teacher for this type of work.

All Science experiments need to be assessed for risk and teachers are required to seek help from the Science Co-ordinator if there is any perceived danger. If a teacher has any doubts about the safety of an experiment, advice must be sought before proceeding.

Appendix A

End of Unit Assessment sheet

Science **Year 3/4** **Cycle A**

Pupil	Helping plants grow well	Teeth and Eating	Materials	Keeping Warm	Solids and Liquids	Magnets and Springs	Comments