SCIENCE POLICY

Longford Park School

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Introduction

The school has a legal responsibility under the 1989 Education Act to deliver Science in the National Curriculum through the relevant Programmes of Study and Attainment Targets as included in updated Science National Curriculum (2014).

At Longford Park we see Science as the practical study of the physical and biological world. It does not deal with abstractions but concentrates on what the child observes in his immediate environment. The world is a very complex place and the main aim is to increase the child’s understanding of its phenomena.

The process skills that we encourage in Science justify themselves. These skills help to develop the child as a whole. The gradual building up of a framework of concepts will help a child to make sense of his experiences. We see the children as developing a rational way of finding out about their world. In this we encourage the development of a willingness and ability to seek and use evidence; fostering skills and attitudes necessary for investigation.

In our objective of delivering science in the National Curriculum we see it playing an integral part of the whole curriculum, where possible we believe the skills and concepts taught in one subject should be used in others.

We hope for the children to establish skills in observation, measurement, classification, collation, communication, investigation, prediction, problem-solving, questioning and reasoning, revising hypotheses, controlling variables, interpreting data, experimentation and evaluation, recognising a fair test. Also developing and encouraging curiosity, questioning, originality, creativity and inventiveness, perseverance, open-mindedness, self criticism, responsibility and safety. On top of all this, a willingness to co-operate, independence of thought, sensitivity to their environment and that of others.

To encapsulate the above:

3 Principles for the teaching of Science at Longford Park School

LAB

L – Learning through a practical and collaborative approach

A – Application of scientific thought. Using scientific knowledge to solve scientific learning questions

B – Building Curiosity – The development of an enquiring scientific mind.
Teaching strategies and Techniques

The teachers will use a combination of strategies:

- First-hand experiences, including visits and field trips.
- A mixture of individual, group and whole-class teaching.
- Planned and appropriate groupings of pupils for tasks. In this we will be aware of the requirements of children with Special Educational Needs and expected outcomes will differ according to these needs.
- We aim to use good oral techniques to set the scene and to explain tasks to the whole class or to a group.
- We will provide opportunities for children to raise questions about their tasks of activities and for the teacher to listen to the pupils.
- Use of visual aids.
- Use of Information Technology.
- We will, through skilful questioning, encourage the children to think and use knowledge already required.
- Good display work.
- Close observation of children’s work and of children at work to help with assessment and regular monitoring of children’s progress.

Equal Opportunities

All pupils, regardless of ability, race, language, gender, class, disability or Special Educational Needs, will be given equal access to Science.

When planning these activities there is awareness that equal access is given to boys and girls.

Classroom management will also be aware that resources will be appropriate to the task and child and should not be biased in any way.

IT in Primary Science

Ideas for use in science activities

1. Communication Information
   Use a tape recorder when surveying environment, clothes etc.
   Planning, recording, evaluating in an investigation
   Posters on environment, safety, healthy food etc.
   Reports on results – in the style of Which? report
   Sequencing e.g. Life cycle, water cycle (needs preparation by teacher)
   Completing a story which sets the scene
   Filling in missing words – ‘cloze’
   Magazine, newspaper on a topic – e.g. recycling, space
   Collaborative word processing of the method of experiment
2. Handling Information
Surveying and storing results of a survey
Storing the results of an experiment
Recording, sorting, averaging
Graphs/pie charts/bar charts
Describing characteristics e.g. plants, food, materials
Topics: ourselves (all parts), weather, food, fruits, soap, sugar, musical instruments, birds, animals, growing plants, seeds, dinosaurs, planets, waste, rocks, leaves, cereals, minibeasts
Use a concept keyboard to plot minibeasts in the grounds, to indicate hazards at home
Existing databases and CD Roms
Spreadsheets with older children

3. Modelling
Exploring patterns with spreadsheets e.g. Do tall children have big feet?
Use programs where variables can be altered
Use maps on the concept keyboard (dated)
Simulation programmes from Granada Learning, electricity boards, Shell – check other commercial firms

4. Monitoring
Measure rate of cooling with temperature sensors. Alter insulation (relate to furry animals, appropriate clothing)
Measure movement of classroom pet/fish with light beam or temperature sensor in nest
Does the body temperature change when we exercise? – Use a sensor
Measure temperature of thawing food – freeze a sausage with a temperature probe inside
How does temperature change when heating water? (Difficult)
Is school heating coming on at best times? – use sensor on a radiator over a long period
What is the best container to take home a pizza or an ice lolly?
How does the temperature around the classroom vary?
Do large or small hot objects cool quicker?
Which lamp/light gives the most light? Which type of candle gives the most light?
Which is the best way to cool a hot drink?
Which is the hottest in the sun? (Different materials, different colours)
What reflect light best? (Safety) Which lets most light through? (Sunglasses)
Sound sensor to compare sounds (insulation, shoes, musical instruments, distance, types of sound, alarm clocks, cars)

There are many possible uses of ICT in teaching and, as with all materials and methodologies, some have a greater potential than others to contribute to the teaching of different subjects. This section highlight the aspects of science teaching were ICT has the potential to make a significant contribution to teaching and learning.
The features of ICT, such as its speed and flexibility, can make significant contributions to pupil’s knowledge, understanding and skills in science.

The use of ICT can help pupils to:

- ask questions, predict and hypothesise;
- observe, measure, record and manipulate variables;
- interpret their results and evaluate scientific evidence;
- present and communicate their findings in a variety of ways.

The use of ICT can extend and enhance pupils understanding of science, through:

i. **stimulations and modelling**, to help pupils understand phenomena which may be too slow, too fast, too dangerous or too expensive to carry out in school laboratory; to allow pupils to investigate the effects of changing variables in the situations represented or to consolidate and reinforce conceptual understanding;

ii. **data logging**, e.g. use of sensors to record temperature, moisture, light and pressure, to assist in the recording, presentation and analysis of results so pupils can spend more time on interpretation, evaluation and hypotheses about their implications;

iii. **databases and spreadsheets**, to enable pupils to organise, search and sort information in order to explore relationships, looks for patterns and test hypotheses, e.g. extracting data on the nutrient value of different foods.

iv. **publishing and presentation software**, e.g. word processors, desktop publishing packages, multi-media authoring software, to enable pupils to develop understanding and present their findings to others;

v. **information resources**, e.g. internet, CD-ROM and datafiles, to enable pupils to find information to develop their knowledge and understanding of science further.

ICT also has the potential to offer significant support to the science teacher by:

- assisting with the preparation of teaching materials;
- assisting teachers to demonstrate experiments and concepts in science, e.g. using presentation packages for whole class teaching;
- supporting pupils working with primary sources of data during investigative and practical work;
- helping pupils to develop research and study skills in sciences, e.g. when researching secondary sources of data.
PHSE and citizenship

As well as making its own distinctive contribution to the school curriculum, science contributes to the wider aims of primary education. Through the science curriculum, children will also learn about aspects of personal, social and health education (PSHE) and citizenship.

There are many opportunities for children’s work in science to contribute to their PSHE and citizenship education.

Children learn:

- that people and other living things have need and that they have responsibilities to meet them
- what improves and harms their local, natural and built environments and some of the ways people look after them
- how to make simple choices that improve their health and well being
- about the process of growing from young to old and how people’s needs change
- the names of the main parts of the body
- that all household products, including medicines, can be harmful if not used properly
- to identify and respect the differences and similarities between people
- to recognise, as they approach puberty, how people’s emotions change at that time
- what makes a healthy lifestyle, including the benefits of exercise and healthy eating
- that bacteria and viruses can affect health and that following simple, safe routines can reduce their spread
- about how the body changes as they approach puberty
- which commonly available substances and drugs are legal and illegal and their effects and risks

SCIENCE TEACHING IS AN AVENUE TO PROMOTE AWE AND WONDER IN PUPIL’S

AT LONGFORD PARK SCHOOL WE ARE ALWAYS LOOKING TO BE INNOVATIVE,
RELECTIVE AND OUTWARD- FACING. WE WILL SHARE AND LEARN FROM OTHERS
MODEL SCIENCE TEACHING AND CONSTANTLY IMPROVE OUR OWN PRACTICE
UNDER THE UMBRELLA OF THE SCIENCE MARK