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Science

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Introduction

We at Berkeley Primary School strive for excellence in Science Education by developing pupils' curiosity, enjoyment, skills and science knowledge, through an approach in which pupils have fun with science, raise questions and investigate the world in which they live. We believe that children should be encouraged to understand how science can be used to:

- explain what is occurring,
- predict how things will behave
- analyse causes.

Aims

- To deliver the science program of study, set out in the National Curriculum 2014 for Science through a creative curriculum approach.
- To promote a love of science learning through a wide variety of teaching and learning styles.
- To promote investigation skills progressively through relevant practical tasks.
- To promote positive attitudes to the learning of science.
- Ensure children are equipped with the scientific knowledge required to understand the **uses and implications** of science, today and for the future.

EYFS

At Little Jesters and then in Reception, we provide engaging scientific activities and experiences for children through the Early Years Foundation Stage curriculum area of 'Understanding the World'. This involves guiding children to make sense of their physical world and community through opportunities to explore, observe and find out about people, places, technology and the environment.

Curriculum Coverage

From Year 1 onwards, the programmes of study for science are set out year-by-year in the 2014 National Curriculum for Science. We are however, only required to teach the relevant programme of study by the end of the key stage: Key Stage 1, Lower Key Stage 2 and Upper Key Stage 2. Within each key stage, school has the flexibility to introduce content earlier or later than set out in the programme, if appropriate. Teachers will base their planning on the programmes of study for their relevant year groups and liaise closely with partner year-groups to ensure all content is covered by the end of the key stage for each cohort.

Scientific Skills & Scientific knowledge

The programmes of study set out units of knowledge and concepts. Teachers will teach these through practical lessons which focus on a particular investigative skill, (previously known as SC1 and now referred to as 'Working Scientifically' in the new curriculum).

At Berkeley, we believe that, throughout the academic year, teachers should plan units, (from their relevant year program of study), to fit their topics and the children's interests as appropriate. However, teachers must try to teach the focus scientific investigation skills in order of the scientific method, as much as possible. This will help children to grasp that all investigative skills from part of a wider process.

The scientific method is a simplified way for children to ask and answer scientific questions by making observations and doing experiments. The steps of the scientific method are to:

- Ask a Question / Make Observations
 - Do Background Research
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- Construct a Hypothesis
- Test Your Hypothesis by Doing an Experiment
- Analyze Your Data and Draw a Conclusion
- Communicate Your Results / Test again.

The suggested model for choosing focus investigative skills across the year:

Autumn 1: Ask questions / make observations. Background research. Construct a hypothesis	Autumn 2: Construct a hypothesis. Plan different types of investigations. Test your hypothesis by carrying out an experiment.	Spring 1: Test your hypothesis by carrying out an experiment. Learning how to take different measurements and record using different methods.
Spring 2: Test your hypothesis by carrying out an experiment. Analyze your data and draw a conclusion.	Summer 1: Analyze your data and draw a conclusion. Write conclusions. Communicate your results.	Summer 2: Recap and revise scientific methods, types of investigation and types of variables.

In each lesson, only one or two investigative skill(s) should be selected, though the teacher may model how it fits in with the wider scientific method. For example, the teacher may plan the investigation and decide on the hypothesis, while the children focus on the skill of measuring and data collection.

Differentiation

The demands of the learning experience should be matched to the abilities and needs of all pupils and ensure appropriate challenge.

Assessment

Teachers will carry out regular formative assessments through discussion with pupils; observation of pupils; marking work; and other Assessment for Learning strategies. These will be recorded on Classroom Monitor and focused on scientific investigative skills 'working scientifically'.

Effective assessment is about 'feedback' and 'feed forward' to inform the next stage of the curriculum as well as formal reporting.

Easy-speak recording devices to assess speaking and listening skills in Science, along with supporting SEN children, who find it challenging writing science down, will be used when appropriate.

Health and Safety

During planning, teachers need to consider and minimise risks for all activities and systematically teach pupils to take responsibility for determining the risk to themselves and others. **All staff follow** COSHH risks assessment guidance in the 'Be Safe' publication kept in the staffroom.

Parental Involvement

Any science trips undertaken should be planned with due regard to the school policy on taking children on outings.



Following the guidelines in the whole school policy, parents may be involved in class based work if they can offer a particular skill or extend and compliment the class teacher's skills and knowledge.

Organisation

The class teacher will normally be responsible for delivering Science, in their single-aged classes. Children will be encouraged to work in whole class activities, small groups and through individual tasks, but the focus will be on encouraging co-operative working. This will be determined by the age, task and ability of the pupils.

A wide range of teaching and learning styles will be used, with focus on investigative activities. Teachers are encouraged to teach science in creative ways using different teaching styles to cater for different ways of learning.

Recording & Evidence

Science work and evidence will be recorded in a variety of ways, appropriate for the science learning taking place and will be up to the discretion of each individual teacher.

For practical activities, recording should be encouraged through (but not limited to):

- pictures,
- videos,
- post-it notes,
- easy-speak recordings,
- drawings

For appropriate written work, recording should be creative whenever possible through:

- models,
- posters,
- animations,
- songs,
- CoverIt Live Blogs

as well as more formal written evidence including (but not limited to):

- investigation plans,
- tables of results,
- written conclusions etc

These can be recorded in Topic books, Big Books, The School Website, displays etc. Teachers must make it clear, what type of evidence is available and where it is stored on their planning documents and learning journeys (medium term plans).

Links with other subjects:

At least one non-fiction unit of Literacy, in each year-group should be focused on teaching children how to write scientific texts and writing up scientific investigation work. Spelling activities should also include scientific vocabulary.

Strong links could be made between instructional writing and writing scientific methods or planning investigations; discussion writing and scientific conclusions; explanation texts and writing up results / linking results with Scientific Concepts.



Excellent teaching methods, taught in Literacy should also apply in Science lessons e.g. when introducing scientific vocabulary, reading scientific texts and learning how to write scientifically. For example, when learning to write scientific questions, good models of 'what a good one looks like' should be used and writing frames given to support children.

Pupils will be taught to use a wide range of appropriate recording methods which will include the use of ICT. The strong practical mathematical links will be seen as an opportunity for teaching and should be explored at the planning stage. Wherever possible, Science will be linked into the Creative Curriculum topic. Spiritual development is encouraged by reminding children of the wonder of science and the effect of scientific discoveries of the modern world.

Links with the outside world:

Teachers will make explicit links between science learning and how it can be applied in outside in the daily-life, where appropriate. Links will also be made through relevant trips, visitors and clubs.

The school are to become a member of The Association of Science Education (ASE).

Resources:

Science resources are kept in drawers on shelves labelled individually, with teacher and teaching assistant access only. Teachers are encouraged to use our Logit Sensors as well as Espresso, British Science Association, the POD, Learning Resources Partnership materials and other online resources to support lessons.

Equal Opportunities:

Equal opportunity will be given to every pupil.

Monitoring and Evaluation:

The role of the subject leader is to:

- Co-ordinate the teaching of science within the school.
- Be responsible for the development for science in school.
- Monitor the effectiveness of science in school.
- Support teachers in their planning and strategies for classroom management.
- Disseminate new information.
- Provide or organise staff training.

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