

**LINGDALE PRIMARY SCHOOL**

**AND**

**LINGDALE PRIMARY SCHOOL TWO YEAR OLD PROVISION**

**SCIENCE POLICY**

**2014 – 2016**

<b>Academic Year</b>	<b>Coordinator</b>	<b>Governor/ Committee</b>	<b>Review Date</b>
2014 - 2015	S Thornton	Curriculum and Achievement Committee	September 2016

Ratified by the Curriculum and Achievement Committee of Lingdale Primary School Governing Body on October 2014.

Signed:

(Chair of Curriculum and Achievement Committee)

Date:

# SCIENCE

## What is Science?

- Developing the understanding of important scientific ideas, processes and skills and relating these to everyday experiences
- Learning about ways of thinking and or finding out about and communicating ideas
- Exploring values and attitudes through science

## Aims:

At Lingdale School we aim to ensure that all pupils:

- develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics
- 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
- are equipped with the scientific knowledge required to understand the uses and implications of science, today and for the future

## Curriculum:

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.

'Working and thinking scientifically' is described separately at the beginning of each programme of study in all key stages, but must always be taught through and clearly related to substantive science content in the programme of study. Throughout the notes and guidance, examples show how scientific methods and skills might be linked to specific elements of the content.

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. They should be 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. They should 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 should be done through the use of first-hand practical experiences, but there should also be some use of appropriate secondary sources, such as books, photographs and videos.

Pupils should read and spell scientific vocabulary at a level consistent with their increasing word-reading and spelling knowledge at key stage 1.

The principal focus of science teaching in **lower key stage 2** is to enable pupils to broaden their scientific view of the world around them. They should do this through exploring, talking about, testing and developing ideas about everyday phenomena and the relationships between living things and familiar environments, and by beginning to develop their ideas about functions, relationships and interactions. They should ask their own questions about what they observe and make some decisions about which types of scientific enquiry are likely to be the best ways of answering them, including observing changes over time, noticing patterns, grouping and classifying things, carrying out simple comparative and fair tests and finding things out using secondary sources of information. They should draw simple conclusions and use some scientific language, first, to talk about and, later, to write about what they have found out.

Pupils should read and spell scientific vocabulary correctly and with confidence, using their growing word-reading and spelling knowledge.

The principal focus of science teaching in **upper key stage 2** is to enable pupils to develop a deeper understanding of a wide range of scientific ideas. They should do this through exploring and talking about their

ideas; asking their own questions about scientific phenomena; and analysing functions, relationships and interactions more systematically. At upper key stage 2, they should encounter more abstract ideas and begin to recognise how these ideas help them to understand and predict how the world operates. They should also begin to recognise that scientific ideas change and develop over time. They should select the most appropriate ways to answer science questions using different types of scientific enquiry, including observing changes over different periods of time, noticing patterns, grouping and classifying things, carrying out comparative and fair tests and finding things out using a wide range of secondary sources of information. Pupils should draw conclusions based on their data and observations, use evidence to justify their ideas, and use their scientific knowledge and understanding to explain their findings.

Pupils should read, spell and pronounce scientific vocabulary correctly.

### **Teaching and Learning in Science**

All lessons need clear learning objectives which are shared and reviewed with the pupils effectively. A variety of strategies, including questioning, discussion, concept mapping and marking, are used to assess progress. The information is used to identify what is taught next.

Activities need to inspire the pupils to experiment and investigate the world around them and to help them raise their own questions such as “Why..?”, “How..?” and “What happens if..?”

Activities need to develop the skills of enquiry, observation, locating sources of information, selecting appropriate equipment and using it safely, measuring and checking results, making comparisons and communicating results and findings.

Lessons must make effective links with other curriculum areas and subjects, especially literacy , numeracy and ICT.

Activities should be challenging, motivating and extend pupils’ learning.

As they move through school pupils have more frequent opportunities to develop their skills in, and take responsibility for, independently planning investigative work, selecting relevant resources, making

decisions about sources of information, carrying out activities safely and deciding on the best form of communicating their findings.

### **The Learning Environment**

Classrooms have displays of current science in hand. The profile of science should reflect its place as a core subject. Resources for the unit of work being covered should be appropriately accessible. Other sources of information should be available.

Teachers at both key stages should maintain a science interest display, which encourages the pupils to be curious about the world in which they live. At Key Stage 1 this might involve something to look at carefully using a hand lens. At Key Stage 2 this might involve a recent newspaper article about a scientific discovery, which builds on, or contradicts, the work of a famous scientist in history.

All classrooms should display prominently the relevant scientific vocabulary being introduced in current units of work.

### **Safe practice**

Safe practice as indicated in The Association of Science Education publication 'Be Safe!' must be promoted at all times. Teachers must also take into account the school's Health and Safety policy. Particular attention must be given to avoid the use of anything that aggravates individual pupil's allergies

### **Making Cross Curricular Links**

At Lingdale Primary School we believe that making links between curriculum subjects and matters, skills and processes will deepen the children's understanding by providing opportunities to reinforce and enhance learning. A majority of our formative assessment will be taken from cross curricular work where children are applying taught matters, skills and processes.

### **Continuity and progression**

The school ensures curriculum continuity by close liaison between staff and the planning stages. (See Appendix A- Year group objectives and Curriculum Overview)

### **Inclusion**

Planning at all levels ensures that the interests of boys and girls are taken into account. At Key Stage 1 the pupils are grouped in mixed ability and gender groups for all activities. In Key Stage 2 pupils may be grouped by ability.

The pupils work individually, in pairs, as part of a small group and as a whole class each term. They use a variety of means for communicating and recording their work.

All pupils, including those with special educational needs, undertake the full range of activities. Teacher assessment determines the depth to which individuals and groups go during each unit of work.

### **Organisation**

Science is taught for 2 hours a week. At least one hour of this time must be 'Working scientifically'.

### **Points for consideration by teachers when planning Science work are**

- Am I promoting Science equally to both sexes?
- Is the material I am using attractive to all children- particular care should be taken when using illustrations in books
- Take care when planning work so that racial ethics are given consideration, especially in work connected with the human body and food
- Am I catering for the needs of the most able and those with learning difficulties? Will the work provided enable all children to feel that they are achieving and progressing?
- If there is evidence of underachievement by any group, positive corrective action must be initiated.

### **Equal Opportunities and Differentiation**

It is important when planning work in Science that the teacher pays close attention to equal opportunity in respect of gender, race , the needs of the most able children and those children with special educational needs.

### **Activating Prior Knowledge**

Using prior assessment information to guide activities and strategies this enables teachers to accurately identify the start point for learning. A record of the activity or strategy outcome is kept in each child's workbook.

### **Learning Intentions/ Objectives**

Based on prior assessment information and outcomes from the activation of prior knowledge teachers identify ordered learning objectives for each group within the class to ensure that progress in learning is made.

Learning objectives and success criteria are to be shared with the children at the beginning of each Geography lesson so that children know their learning steps throughout the lesson.

See Appendix A for year group objectives and curriculum overview.

### **Differentiation**

There are a number of different forms of differentiation:

- By outcome – where a task is given and the children respond at different levels
- Different tasks around the same topic matched to the needs of the children
- Variety of input for the same task
- Variety of questioning
- Completing different tasks

## **Contribution of Science to other areas of the curriculum**

The teaching of literacy, Numeracy and ICT is promoted strongly in science as part of this school's drive to raise standards in English and Mathematics. Science is used to extend and enable the pupils to practise the skills of language and literacy and Numeracy.

### **Literacy**

In particular, at Key Stage 1 the pupils are encouraged to use their speaking and listening skills (especially in Attainment Target 1) to describe what they see and explain what they are going to do next. At Key Stage 2 the pupils are encouraged to develop their skills of writing to record their planning, they should be applying their literacy skills at levels similar to those which they are using in English work. Appropriate vocabulary (and the correct use of this vocabulary) should be encouraged both orally and when recording.

### **Numeracy**

At both key stages the pupils are expected to use their knowledge and understanding of measurement and data handling at appropriate levels. In science, they should be applying their Numeracy skills at levels similar to those which they are using in their mathematics lessons, particularly when interpreting data. In this respect the two subjects are very closely linked- pupils need to be able to interpret data effectively in order to form valid conclusions for their science investigative work.

### **Information and Communications Technology**

The pupils' ICT skills are applied as identified in the medium term planning. At both key stages this involves the pupils using ICT to ;: locate and research information (CD Rom, internet); record findings (using text, data and tables); log changes to the environment over time (sensing equipment); gain confidence in using calculators, VCR, video cameras, digital cameras, and tape recorder as well as the computer. The use of



this equipment is indicated in medium term planning and must be used. It forms an important part of the entitlement of all pupils in ICT.

### **Spiritual development**

Spiritual development is encouraged through reminding pupils of the wonder of science and the effect of scientific discoveries on the modern world. Topical scientific issues are also discussed where appropriate.

### **Personal, Social and Health Education**

Health education is taught as part of the units on ourselves, health and growing, teeth and eating, moving and growing, keeping healthy and life cycles.

### **Assessment, Recording and Reporting in Science**

#### **Types of Assessment**

**Formative** – assessment for learning – allows the teacher to see what the child knows, understands and can do

**Summative** – assessment of learning – records overall achievement of the child

**Diagnostic** – identifies areas of strength and weakness

**Evaluative** – allows teachers and school leaders to see the effectiveness of teaching in terms of performance

#### **Formative Assessment**

Formative assessment is embedded in the teaching and learning process of Science at Lingdale Primary School.

It involves:

1. Evaluating pupils level of knowledge
2. Setting explicit learning intentions
3. Sharing learning intentions and success criteria with pupils
4. Questioning effectively

5. Pupils evaluating their own and peers performance against success criteria
6. Teacher s and pupils reflecting and reviewing performance and progress
7. Effective feedback, both oral and written, to inform pupils what they should do next
8. Children responding to feedback

### **Self-Assessment and Peer Assessment**

Peer and self-assessment are ways of engaging children in understanding their progress in learning and identifying next steps in their learning that can be used in addition, and to support, to oral and written feedback from teachers and Support Staff. The aim is to involve children in the analysis and constructive criticism of their own and others work.

Learners use the success criteria to make judgements on their own, and peers, learning and identify areas for development – next steps.

### **Day to Day Assessment**

The main focus involves teachers using their professional skills to observe a child to see if the work provided for them is sufficiently challenging to ensure progress or that misconceptions or 'gaps' are not impacting on progress. The assessments are recorded on the planning sheets and used to inform future planning.

This may be achieved through:

- Questioning
- Observing
- Discussing
- Analysing
- Checking children's understanding

- Engaging children in reviewing progress

### **Assessment of Learning – Summative Assessments**

At the end of a unit of work summative assessments are made about each child's achievements throughout the unit and are they recorded on the Summative assessment. Each statement that the child has achieved throughout the unit is highlighted and dated. Teachers should also note where evidence for each achievement can be found.

Strengths and areas for development are identified and this informs future learning of the skills matters and processes for the next unit of work.

Then at the end of each term a summative judgement is made as to whether individual children are emerging, at expected or exceeding the year group expectations in Science.

### **Assessment for Learning – Formative Assessments**

The skill, matter or process objectives and success criteria are made explicit in all planning. Key questions and cross-curricular opportunities are identified on weekly planning.

Assessment opportunities are identified in weekly foundation planning and these form the basis planning for learning for the next lesson.

Teachers make brief notes in the assessment note column on planning to inform subsequent teaching and learnings. It is best practice to be constantly be revising planned learning.

### **Target Setting**

Target setting involves staff and children identifying challenging and measurable targets. These are realistic and manageable and aim to raise self-esteem through success.

By evaluating tasks that activate children's prior knowledge, teachers can then plan a set of challenging but achievable targets/learning objectives for the unit of work in Geography.

The performance of each child is monitored during and recorded at the end of each unit.

## **Marking and Feedback**

### **Rationale**

We are committed to providing relevant and timely feedback to pupils, both orally and in writing. Marking intends to serve the purposes of valuing pupils' learning, helping to diagnose areas for development or next steps, and evaluating how well the learning task has been understood. Marking should be a process of creating a dialogue with the learner, through which feedback can be exchanged and questions asked; the learner is actively involved in the process.

At Lingdale Primary School, we aim to:

- Provide consistency and continuity in marking throughout the school so that children have a clear understanding of teacher expectations;
- Use the marking system as a tool for formative ongoing assessment;
- Improve standards by encouraging children to give of their best and improve on their last piece of work;
- Develop children's self-esteem through praise and valuing their achievements;
- Create a dialogue which will aid progression.

### **Principles of Effective Marking**

Effective marking should:

- Be manageable for staff
- Be positive, motivating and constructive for children
- Be at the child's level of comprehension
- Be written in handwriting that is legible and a model for the child
- Allow specific time for the children to read, reflect and respond to marking
- Involve all adults working with children in the classroom
- Give children opportunities to become aware of and reflect on their learning needs
- Give recognition and appropriate praise for achievement
- Give clear strategies for improvement
- Provide information for the teacher on the success of the teaching
- Feedback should relate to the Geography learning objective/success criteria of the work set e.g. marked mainly for the Geography content, not the punctuation but spellings that are applicable should be addressed.
- Positively affect the child's progress.
- Look for progress and success before areas to develop.
- Be positive for children.

## **Effective Marking and Feedback Strategies**

The following strategies can be used to assess, mark and provide feedback:

### **1. Verbal Feedback**

This means the discussion of work in direct contact with the child. It is particularly appropriate with younger, less able or less confident children.

A discussion should be accompanied by the Verbal Feedback Stamp in the child's book along with the context in which the work was done and an outline of feedback given.

## 2. Success Criteria Checklists

### Success Criteria

Success criteria are shared with all children and displayed throughout the lesson to be used by the learner, peers or teacher. These should be differentiated where appropriate.

Success Criteria checklists can be used in all subjects and may include columns for self/peer assessment and teacher assessment. These should be differentiated where appropriate.

For example:

<b>Success Criteria Checklist</b>	
Learning Objective: To identify the parts of the water cycle.	
1. Understand that water can be found in different states	
2. Understand that the temperature of the water defines its state	
3. Understand that changes in state are reversible	

## 3. Feedback Comments - Tinkled Pink and Build on Blue

Personalised Quality Feedback Comments should be used frequently to extended learning and must be differentiated appropriately. When marking, staff may see a piece of work that requires clarification or is a good opportunity to extend that child's learning. The emphasis when marking should be on both success and areas for development against the learning objective and success criteria. 'Correct' work is highlighted in pink (Tinkled Pink) and areas for development are highlighted in blue (Build on Blue), with a corresponding written prompt. A focussed

comment should help the child in “closing the gap” between what they have achieved and what they could have achieved.

#### **4. Responding to Marking**

All lessons **must** start with an opportunity for children to respond to marking and feedback from the previous lesson.

#### **Moderation**

Moderation is the process of bringing individual judgements into line with general standards and those throughout school and nationally. Moderation is carried out termly for Science.

#### **Financial Commitment**

The financial commitment for Science will differ each year, details of which will be found in the SDP. However, in order that staff can deliver the Science Curriculum effectively, the following financial commitment is envisaged.

- an annual maintenance budget
- a budget for staff development
- bids for specialised amounts of funding
- a financial commitment for Science will be presented each year to the Head teacher for discussion and approval.

#### **Monitoring and Evaluation of the Science Policy.**

The moderation of the teaching and learning of Science at Lingdale Primary will occur termly alongside moderation of work.

Monitoring and evaluation of teaching, learning and the curriculum enable us to:

- Find out about the quality of teaching and learning and standards of achievement

- Identify strengths and areas for development
- Identify areas for development and take appropriate action
- Ensure consistency in continuity and progression
- Provide appropriate support and resources
- Ensure the needs of all groups or children are addressed
- Share good practice

The Headteacher monitors:

- Long term, medium term and short term planning
- Co-ordinates and monitors moderation of judgements
- Scrutinises marking and feedback in workbooks
- Ensures policy is implemented

Subject Leader monitors:

- Long term, medium term and short term planning
- Annual assessments when a summative judgement is made.
- Co-ordinates and monitors moderation of judgements
- Ensures policy is implemented
- Supports and guides teachers in teaching and learning of Science.
- Monitors and evaluates practices in school
- Keeps up to date with latest initiatives, research and resources and communicate these to staff
- Attends relevant CPD
- Prepares, organises and delivers appropriate CPD

All staff:

- Complete weekly planning that indicates assessment focus
- Assess pupils work in each lesson and provide notes on planning
- Plan learning that is in response to assessment information
- Highlights childrens achievements on the Summative assessment sheets at the end of a unit of work.



- Makes a summative judgement at the end of the year or upper/lower keystage for each child.

### **Review and Evaluation of the Policy**

The policy will be reviewed annually, to ensure it is kept in line with any curriculum changes that take place within the school or externally.

**This policy was revised and updated in June 2014 by S Wall**

**Next review is July 2016**