



## Science Curriculum Policy

September 2018

### Rationale

Science is a body of knowledge built up through experimental testing of ideas. Science is also methodology; a practical way of finding reliable answers to questions we may ask about the world around us. It is about developing pupils' ideas and ways of working that enable them to make sense of the world in which they live through investigation.

Through the teaching of Science, we would like to:

- Prepare our pupils for life in an increasingly scientific and technological world.
- Help our pupils to see the relevance of Science to the world around them, using practical experiences (including use of the school grounds) as often as possible.
- Build on our pupils' natural curiosity about the world around them.
- Develop a scientific approach to answering scientific questions.
- Provide our pupils with an enjoyable experience of science, so that they will develop a deep and lasting interest and may be motivated to study Science further.

### TEACHING OF SCIENCE AT BALFOUR

Science at Balfour is taught through a creative curriculum from Cornerstones. Each term a topic is taught in each year group and science is linked closely to other curriculum areas. Each year group will study at least one science focused topic per year. Through monitoring of coverage and curriculum planning it is ensured that all programmes of study from the National Curriculum are taught and scientific skills are developed through investigative learning experiences.

As far as possible, scientific knowledge should be taught through one of the five ways of "Working Scientifically" (as outlined in the preamble to the National Curriculum):

- Fair and comparative testing;
- Observing over time;
- Sorting and classifying;
- Pattern-seeking;
- Research using secondary resources;
- (and a sixth – not mentioned in the National Curriculum) Exploring or modelling.

Obviously, some topics lend themselves more to one way of "working scientifically" than others. Furthermore, some ways of "working scientifically" will be more appropriate to some year groups than others. Children should be encouraged to ask their own scientific questions where possible, especially when conducting investigations (although this will be more relevant in UKS2). Details on the ways of "working scientifically" can be found on the staff shared area.

Although it is desirable for children to explore scientific knowledge through one of these ways of “working scientifically”, this is not always possible. Therefore, teachers should aim for 80% of lessons where pupils learn Science through one of these ways of “working scientifically.”

Pupils should be encouraged to ask their own scientific questions when “working scientifically” and take decisions on how to conduct an investigation. During LKS2, it is anticipated that the process of scientific investigation, especially when conducting fair and comparative tests, should be guided by the teacher. Post-it note investigation grids are available on the shared area to support children. It is perfectly acceptable for teachers to do this as a class and use a photocopy in their books.

However by UKS2, pupils should be encouraged to make decisions about how they conduct investigations, although the degree to which they do this should be at the discretion of the class teacher. This does not necessarily mean that they are given absolute independence (and they should be steered away from poor choices): it could mean that they are given the opportunity to discuss a range of choices. Again, post-it note planners can also be used to support children with the planning structure for investigations.

A breakdown of the skills pupils need to “work scientifically” by year group is available on the shared area.

### **TIME ALLOCATED**

At Balfour Junior Academy, Science should be taught 9 hours per term. If 6 weeks is taken as an average length term, this amounts to 1.5 hours per week.

There are five topics per year group in the National Curriculum. This means that in one term, Science may not be taught or a topic may be extended over two terms.

### **MARKING**

Marking in Science should follow the school marking policy, ensuring correct use of scientific language (including the correct spelling) and dispel misconceptions.

### **ASSESSMENT**

#### **HOW ARE PUPILS ASSESSED IN SCIENCE?**

There are two criteria for assessing progress and attainment in Science: skills and knowledge. As a school, we assess our pupils in the foundation subjects termly using a progress tracker. The progress tracker uses eight statements describing “at expected” and “above.” There are no statements for “below” as it is implied that any pupils not achieving expected must be below. The teacher should make a best-fit judgement to give a broad overview of progress. The eight statements relate to scientific skills only.

If requested, teacher assessments need to be formally submitted to the relevant authority at the end of KS2.

#### **HOW SHOULD INVESTIGATION SKILLS BE TAUGHT?**

#### **WRITING-UP SCIENCE INVESTIGATIONS**

Sometimes it will be appropriate for investigations to be written up in full. However, it is not desirable that this happens every time children conduct a Science investigation. Instead, teachers should choose one aspect (or maybe more if conducted over more than one lesson) of the investigative process to focus on

(e.g. recording skills, measuring skills, making predictions). This will depend upon the investigation and teachers should exercise their professional judgement to make that decision.

It may also be necessary to conduct investigations as a class to model expectations and the investigative process. This will be particularly relevant in LKS2 and can be an effective way of supporting the teaching of investigative skills.

### **HEADINGS FOR INVESTIGATIONS (fair and comparative testing, observing change against time).**

To ensure consistency across the school, the following headings should be used in pupils' books.

- Prediction (there is no need to use the term "hypothesis" in primary school).
- Variables (pupils will need support in LKS2 to identify all variables).
- Fair test (pupils in y3 especially, will need support to explain how a test is "fair." By UKS2, pupils should be able to identify which variables they are keeping the same and the variable they are going to change. There is no need to refer to dependent and independent variables in KS2).
- Results (may be presented in tables and it may be sometimes necessary to draw a graph).
- Conclusions.
- Evaluation (this is explored very simply in LKS2 and in much more depth in UKS2).

### **CROSS-CURRICULAR LINKS**

English is a key area for development at Balfour Junior Academy. Where possible, Science should be used to support and improve English by linking writing in Science to one of the genres taught in English (e.g. instructions, explanations, non-chronological reports, biography etc). This should be done once a term and should be marked developmentally in accordance with the school's marking policy.

Where possible, links to Mathematics should be made. This can be done through data-handling skills: reading scales on measuring apparatus, and using tables and graphs to record and interpret results. However, other links to Mathematics can be made. For example, distances between celestial objects, constructing scale models of the solar system etc.

Links to other subjects may be made (e.g. Geography when learning about rocks in year 3). These should be made to deepen our pupils' understanding.

### **DISPLAYS and VOCABULARY**

Developing a good knowledge of scientific vocabulary is key to success in Science. Pupils often find Science challenging because they do not have a good enough grasp of the vocabulary needed to explore their ideas. Key vocabulary should be displayed on topic working walls, if there is space. This should be referred to throughout the teaching of each topic. Pupils should have the opportunity to explore ideas orally first and teachers should model and encourage pupils to use vocabulary correctly. Teachers should consider making use of diagrams and other ways of graphically representing complex information to support their pupils' understanding.

Vocabulary lists for each topic are available on the shared area.

## **MONITORING**

Monitoring of the teaching and learning of Science at Balfour will take place as directed by the subject leader's action plan. Findings will be communicated back to year group leaders and to the relevant member of SLT.

## **EQUAL OPPORTUNITIES**

It is intended that all pupils should have access to the science curriculum. Special arrangements may need to be made for those children with Special Educational Needs and English as an additional language.

As with other subjects, in the teaching of science there is a need for an awareness of cultural, ethnic, and gender differences. All staff should act to ensure a balance of equal opportunity and expectation, in accordance with national requirements for inclusion.

## **HEALTH AND SAFETY**

Staff follow the health and safety guidelines for Science teaching set out in the ASE 'Be Safe' publication and the CLEAPSS 'A Model Code of Practice for Science [and Technology] in Primary Schools' publication (available in the Science cupboard and in the shared area).

Staff should ensure they are familiar with the health and safety requirements when handling living organisms, food and chemicals, or using tools and apparatus during Science lessons. Children should also be taught to recognise hazards and assess risks in accordance with the National Curriculum.

Learning through the school grounds is encouraged and a risk assessment of the school grounds has been made by the Subject Leader (available in the Science cupboard and on the shared area)

## **RESOURCES**

A wide range of equipment and resources are kept in the locked science cupboard. The key is available from the Subject Leader. Some items (such as microscopes and text books/reference materials) are kept within year groups. Perishable resources need to be ordered prior to teaching from the Science Leader. A small number of "vulnerable" resources are kept by the Science Subject Leader.

Clare Atkins (Science Subject Leader)

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