

# How to be Brilliant at Recording in Science

Neil Burton



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# Introduction

*How to be Brilliant at Recording in Science* contains 38 photocopiable ideas for use with 7-11 year olds (plus two for teachers to use). The book contains structured worksheets aimed at developing a systematic approach to investigating in science. The format for recording suggested here is based upon the premise that the work should be practical and related to children's own ideas and understanding. *How to be Brilliant at Recording in Science* is designed to be highly compatible with National Curricula throughout the United Kingdom.

Each worksheet is designed to have a particular skills focus and we recommend that you read through the teacher's section before using the sheets to ensure that you choose the one most closely matching the learning objectives you have set. Also, suggestions are made for adapting particular sheets to meet the particular, differentiated needs of your pupils.

These sheets are *not* designed to be used in isolation, but to supplement any science scheme that is being used. The teacher should provide the context for the activity. The use of one or more of these sheets will encourage pupils to adopt a more structured and systematic approach to their work in science.

The worksheets in this book are subdivided into six sections:

## **Teacher sheets**

The two sheets in this section are designed to assist the teacher in planning for pupil led investigations and to record assessments of how well individual children are meeting the learning objectives being set for them.

## **Thinking and planning**

These sheets are designed to encourage children to think about the activity before they attempt it; to discuss and record their ideas, predictions and hypotheses; and to concentrate on the planning of particular aspects of the science activity.

## **Recording results**

These sheets provide structured formats that are sufficiently flexible to be used in a very wide range of situations, in conjunction with sheets from the previous section.

## **Observation**

These sheets provide formats for the recording, ordering and sorting of observations.

## **Presenting findings**

These sheets provide a wide range of formats suitable for presenting most forms of data that can be collected from investigations.

## **Content specific**

This section contains sheets for the recording of ideas, observations and measurements about particular scientific content areas.

# Using the worksheets

Below, for each of the sheets, we identify some of the potential learning objectives that children could be steered towards.

## Teacher sheets

### Investigation planning sheet page 9

To be used at the topic planning stage for the teacher to:

- identify the expected prior learning of the children;
- predict the actual activities that might be required;
- identify parts of the NC requirements.

### Group assessment page 10

To be used during discussion or observation of practical work to:

- provide a format for recording the degree to which individual children have attained particular planned learning objectives.

## Thinking and planning

### Brainstorm! page 11

Children should be able to:

- demonstrate an understanding of the factors that might potentially effect the outcome of an investigation;
- share and discuss their understanding.

### My ideas page 12

Children should be able to:

- predict the outcome of an activity;
- provide adequate reasons (hypothesize) why this should happen;
- give a brief account of what actually happened.

### Our ideas page 13

Children should demonstrate the ability to:

- share and consider each other's ideas;
- arrive at a compromise, or otherwise agreed, position.

### Questions! page 14

Children should demonstrate the ability to:

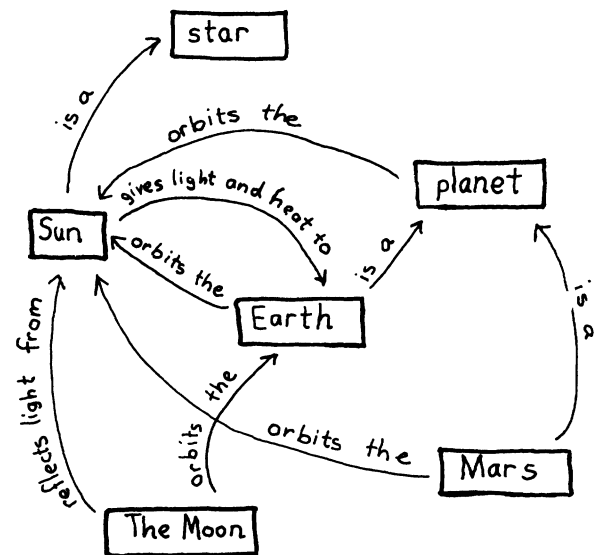
- identify areas relevant to the line of enquiry;
- to phrase questions in a format that could lead to investigation.

## Concept mapping

page 15

Children should demonstrate the ability to:

- identify words relevant to the area of study;
- link these words in a meaningful way to show understanding of underlying scientific concepts ('force' and 'move' could be linked together, as in: 'force' needs to be applied to make an object start to 'move').



## Fair test

page 16

Children should demonstrate the ability to:

- identify the factors that will be controlled to make the investigation fair;
- explain how these factors will be controlled to make the investigation fair;
- explain how the investigation will be carried out to ensure that the results are valid (indicate that the test will be repeated or carried out over a suitable period of time).

## My plans

page 17

Children should produce:

- a sequenced plan for the investigation;
- a comprehensive list of equipment.

## Keeping a record

page 18

Children should demonstrate the ability to:

- measure changes;
- record these measurements;
- present the data.

**Measuring changes** **page 19**

Children should demonstrate the ability to:

- make appropriate choice of measuring devices.

**Keeping it safe** **page 20**

Children should identify:

- the equipment they intend to use;
- the safety implications of the activity they intend to carry out;
- the safety points they have learned from the activity.

**Show that I understand the process** **page 21**

Children should demonstrate the ability to:

- describe the process as a sequence of events;
- demonstrate understanding of why the process takes place;
- suggest an activity that would support their explanation.

(Processes such as evaporation, breathing, echoes, etc. could all be approached in this way, both before, and after, the subject is formally taught – any improvements in understanding can then be identified.)

**This is what I know about ...** **page 22**

Children should be able to:

- demonstrate their knowledge about a particular aspect of science;
- identify potential sources of information, both primary and secondary.

**Recording results****Recording sheet** **page 23**

Children should demonstrate the ability to:

- make a series of linked observations.

This is a very flexible multipurpose format designed to be used for recording changes that occur over time. Examples of contexts in which it can be used appear on page 8.

**My results** **page 24**

Children should demonstrate the ability to:

- make a careful record of their results.

Differentiation can be built in by the teacher part-completing the table, with headings etc.

**Science prompts** **page 25**

Children should demonstrate the ability to:

- complete a 'full write-up' of a science investigation.

We advise that this sheet is best given once the children are used to the full range of structured sheets provided here, and even then, only infrequently.

**Tally chart** **page 26**

Children should demonstrate the ability to:

- record the results of surveys.

**Observations****Similarities and differences** **page 27**

Children should identify:

- similarities and differences between living things, plants and phenomena.

**Sort it out!** **page 28**

Children should demonstrate the ability to:

- differentiate and identify variations across a range of similar living things, materials and phenomena.

**Sorting key** **page 29**

Children should demonstrate the ability to:

- identify categorical differences between a range of similar things;
- sort according to these differences;
- devise a sorting key based upon these differences;

boxes are for questions

boxes are for items

**Guess what I've seen!** **page 30**

Children should demonstrate the ability to:

- identify where particular living things, materials or phenomena have been found or seen to occur.

**Presenting findings****Sorting into sets, 1** **page 31**

Children should demonstrate the ability to:

- sort a group of living things, materials or phenomena into two mutually exclusive sets.

**Sorting into sets, 2** **page 32**

Children should demonstrate the ability to:

- sort a group of living things, materials or phenomena into two not mutually exclusive sets.

**The Daily Scientist** **page 33**

Children should demonstrate the ability to:

- communicate science activities in different ways.

**Cycles** **page 34****Chain** **page 35**

Children should demonstrate the ability to:

- understand and record processes and cyclical changes.

**Bar chart** **page 36****Line graph** **page 37****Pie chart** **page 38**

Children should demonstrate the ability to:

- present the results of scientific activity in a suitable format.

**My findings, 1** **page 39****My findings, 2** **page 40**

Children should demonstrate the ability to:

- use results to support conclusions;
- indicate whether predictions are supported by experimental evidence;
- explain how scientific understanding has been developed as a result of the findings from the investigation.

Please note: My findings, 2 is at a bit higher level than My findings, 1 – it seeks the scientific foundations on which the prediction was based.

**Applying and understanding** **page 41**

Children should demonstrate the ability to:

- relate experimental evidence to wider experience and observations.

**Content specific****My minibeast** **page 42****My plant** **page 43**

Children should demonstrate the ability to:

- observe living things in greater detail.

**Just the job!** **page 44**

Children should demonstrate the ability to:

- identify the necessary characteristics of a material suitable for a particular purpose;
- demonstrate knowledge about the characteristics of various materials;
- identify tests to assess the characteristics of various materials.

**The case of the empty torso** **page 45**

Children should demonstrate:

- knowledge about the location of the internal organs of the human body.

(Use before and after the topic and see the difference.)

**Measuring and comparing** **page 46**

Children should demonstrate the ability to:

- compile and record various body measurements;
- compare the measurements of different individuals;
- look for relationships.

**Myself, 1** **page 47****Myself, 2** **page 48**

Children should demonstrate the ability to:

- record individual details in a set format;
- appreciate the relationship between pulse rate and fitness.

**Note**


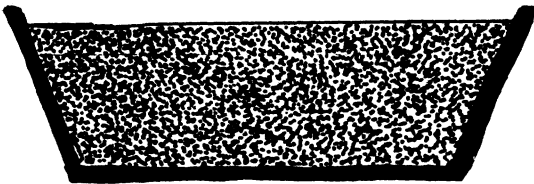

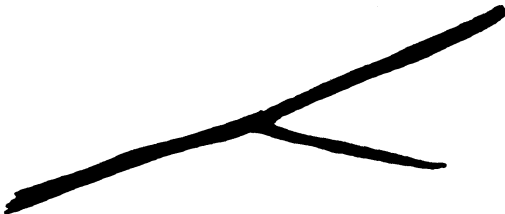
Some sheets, especially group ones, can be enlarged to A3 size if you have the facilities, to allow all children to participate fully.

# Using the Recording sheet on page 23

In general terms, this sheet is designed to be used to record observations over a period of time, in order to show change. The length of time between each observation will obviously vary considerably, depending on the nature of the investigation being carried out.

More able 5-7 year olds, and most in the 7-11 age group, will probably be able to cope with a blank worksheet but others may well be helped by the addition of a simple drawing in each of the sections to start them off. Below, are some suggestions of the type of investigation they could be used with.

Possible drawing on the grid

 <p>(saucepan)</p>	<p><b>Heating water</b> Start with ice cubes or cold water in the Pyrex saucepan. Heat it on a 'Baby Belling' or similar hot plate. Children record what is happening in the saucepan at between 5 to 10 minute intervals.</p>
 <p>(seed tray)</p>	<p><b>Growing seeds</b> Start at the point where the first shoots break through the surface. How frequently you ask the children to update their records on the sheet will depend on what type of plant you are growing. If different groups within the class are observing seedlings growing in different conditions, it is important that all the sheets are updated at the same time so that fair comparisons can be made.</p>
 <p>(rounders post)</p>	<p><b>Apparent motion of the sun</b> There are two ways to approach this: either record the length and position of the shadow at different times during the course of a day, or record the length of the shadow at the same time of day but on different weeks.</p>
 <p>(twig)</p>	<p><b>Growing animals</b> How often you record will depend upon the animal you are observing. Those that will produce significant changes in a relatively short period include butterfly and moth larvae (where their food is available) and small numbers of tadpoles. Include a starting point on the sheet (eg a twig) to help establish a 'scale'.</p>



# Investigation planning sheet

Area for investigation	Learning objectives		
Context/topic area	Ideas the children hold/ might hold	Possible activities	Possible outcomes
Skill focus	Resource requirements		
Content focus			
NC relevance			

# Group assessment

Teacher \_\_\_\_\_ Date \_\_\_\_\_

Activity \_\_\_\_\_ Class/group \_\_\_\_\_

## Objectives

Names						Comments

Group evaluation