



# The Learning Institute

## Supporting primary science

### Part 3: Working scientifically

#### Overview

Science, together with English and mathematics, is a core subject within the national curriculum therefore science should have a prominent place within the timetable. This CPD task seeks to support practitioners by helping them to understand the structure of primary science curriculum and learn ways to support pupils in practical science activities. There are three separate stand-alone parts to this CPD.

This third part helps to give you an understanding of the Working Scientifically element of the science curriculum. It will help you realise how it should be integrated with knowledge and conceptual understanding. You will consider how best to support children when they are carrying out scientific enquiries.

#### Target audience

Teaching assistants, and others who work in primary science

#### Duration

Approximately 1 hour

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## Introduction

Whether science is taught as a discrete subject or as part of a cross-curricular approach, it should involve pupils in practical experiences and active learning to find the answers to scientific questions. For this reason, it is often very popular with pupils of all ages.

These activities are usually in the form of investigations or “scientific enquiry” which are underpinned by a set of skills that are built on through the key stages. These skills are very different from the knowledge and conceptual understanding skills that were the focus of part 2 although they are inextricably linked.

This third session familiarises you with these scientific skills and helps you to understand how they fit within the curriculum. You will explore how the skills are built upon as learners progress through Key Stage 1 (KS1) and Key Stage 2 (KS2). Effective strategies used to support children will be considered.

## Objectives

- To understand the meaning of Working Scientifically
- To be aware of how Working Scientifically is taught
- To explore the progression of skills through KS1 and KS2
- To consider ways to support children effectively when they are involved in scientific enquiry

## Resources

Pen and paper for note taking

Internet access to following:

- Science programmes of study: key stages 1 and 2 [document], available at [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/425618/PRIMARY\\_national\\_curriculum\\_-\\_Science.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/425618/PRIMARY_national_curriculum_-_Science.pdf)
- Working scientifically in the primary classroom [document], available at <http://www.ciec.org.uk/pdfs/resources/working-scientifically.pdf>

## Task 1: Working scientifically

This task will help you to become familiar with the “nature, processes and methods of science” element of the science curriculum. You will learn about the relationship between this *Working Scientifically* area and the *Scientific knowledge and conceptual understanding* element (the focus of part 2 of this CPD series). It will help you become aware of both the content and how the skills build on one another as children progress through the key stages.

Access the science national curriculum available at:

[https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/425618/PRIMARY\\_national\\_curriculum\\_-\\_Science.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/425618/PRIMARY_national_curriculum_-_Science.pdf)

- Read the paragraph on “*The nature, processes and methods of science*” on page 4
- Read the statutory requirements plus the notes and guidance for *Working Scientifically* for KS1 on page 6, lower KS2 on page 14 and upper KS2 on page 25

The notes and guidance give you an indication of what kinds of enquiry the children will be undertaking to learn the required skills.

These skills must have a context for them to be meaningful and it is made very clear that they should not be taught in isolation. They “*must always be taught through and clearly related to the teaching of substantive science content in the programme of study* (Department for Education, 2013, p.5).

What do you think is meant by this and why is it so important?

## Task 2: Progression of skills

This task will make you aware of the common elements found throughout *Working Scientifically* and will help you recognise the progression of skills as children progress through the key stages.

According to the Association for Science Education (2018, p 6) there are five types of enquiry:

- *Observing changes over time*
- *Noticing patterns*
- *Grouping and classifying things (noticing similarities and differences)*
- *Comparative and fair testing*
- *Finding things out using secondary sources of information (researching)*

These are common to all ages. However, as you will have noticed in the previous task, the skills are developed and built as the child gets older.

Look at the four posters found on pages 8 -11 of the following document: *Working Scientifically in the primary classroom*, available at: <http://www.ciec.org.uk/pdfs/resources/working-scientifically.pdf>

Choose three specific enquiry skills that you can track through from Early Years Foundation Stage to upper KS2.

You will notice how simple skills are developed and built upon. It is important that pupils are given experience of Working Scientifically whatever their age in order to have a sound basis to progress. They cannot learn such skills by watching – they need to be doing!

### Task 3: The role of the adult in supporting scientific enquiry

You should now be familiar with the elements of working scientifically. From the previous task, you will know that asking questions, discussing, observation and observing are just some the skills we are trying to develop. So how can you support children in developing these skills? Your own skills can have a real influence on this development.

Here are some Dos and Don'ts that you might like to consider for your own practice:

#### Do:

- Wherever possible, try and stand back and let children work independently
- Get the children to explain what they are trying to find out
- Ask the children to justify their actions and choices
- Encourage children to talk to each other about what they are doing
- Ask what they have found out and can they think of anything else they could do to learn more

#### Don't:

- Tell a child that what they are doing is wrong – rather ask them if they can think of a different way of doing the task
- Laugh at a child's ideas – rather ask them what makes them think that
- Take over practical activities from a child if they are having difficulty – rather ask them what makes the task so difficult and could they think of a different way of doing it
- Interrupt a scientific conversation between children – explaining their ideas will help clarify their ideas

### Task 4: Reflection on learning

Note down your responses to the following questions:

- What knowledge did I already have that has been refreshed by this CPD?
- How has this CPD developed my knowledge and understanding?
- How can I apply what I now know to my practice

## Sources

Association for Science Education (2018) *Scientific enquiry*. Available at:  
<https://www.ase.org.uk/system/files/Scientific%20Enquiry%20in%20the%20UK%20V2.pdf>  
(Accessed 25 June 2020)

Centre for Industry Education Collaboration (2020) *Working scientifically in the primary classroom: progression of enquiry skills from EYFS to KS3*. Available at:  
<http://www.ciec.org.uk/pdfs/resources/working-scientifically.pdf> (Accessed: 25 June 2020)

Department for Education (2013) *Science Programmes of study: key stages 1 and 2*. Available at:  
[https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/425618/PRIMARY\\_national\\_curriculum\\_-\\_Science.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/425618/PRIMARY_national_curriculum_-_Science.pdf) (Accessed 25 June 2020)

## Further reading

Mepsted, J. (2018) *Supporting the teaching and assessment of working scientifically*. Available at:  
<https://www.ase.org.uk/system/files/19-20.pdf> (Accessed 25 June 2020)

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