

# Nature of science and science capabilities

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## Nature of science and science capabilities

### Chris Joyce, 2014

This summary provides information about:

- the Nature of science (NOS) in The New Zealand Curriculum (NZC)
- Science Capabilities for Citizenship
- how to access and use NOS and Science Capabilities resources from the Assessment Resource Banks.

## Nature of Science

"Science is a way of investigating, understanding, and explaining our natural, physical world and the wider universe" (Ministry of Education, 2007, p.28).

NZC subscribes to a view of science education as science for citizenship. Students are equipped to "participate as critical, informed, and responsible citizens in a society in which science plays a significant role" (Ministry of Education, 2007, p.17). In other words, we want students to not only know science, but to be able to use that knowledge.

The Nature of Science (NOS) strand is about how science knowledge is created, validated and used. Understanding the discipline of science helps students to engage with science in their lives.

At NZCER we think that NOS should not be regarded as an extra. It is about what you focus on as students are working on science activities. Science knowledge is still important, but there is more emphasis on knowing for a purpose. You can find out more about NOS activities at Science Online, Nature of science.

## Assessment and NOS

The core strand of science in NZC is the NOS strand. This has some repercussions for assessment. It signals that we should be interested in students' understanding of this aspect of science. We might, though, also want to understand how children think about important ideas in science.

## Locating ARB resources that focus on NOS

We have grouped science resources under the four aspects of NOS in NZC. Resources that don't have a NOS focus have been grouped under Knowledge.

The Advanced Search enables you to search using any of the five headings:

- Understanding about science
- Investigating in science
- Communicating in science
- Participating in science
- Knowledge.

All NOS resources are embedded in a science context. If you search using the contextual strands the search results will show which NOS category they sit under.

## Supporting NOS teaching

There are two categories of ARB resources that have been grouped under the four NOS themes.

### **Resources specifically designed to assess NOS**

The student task models questions with a NOS focus. Marking Student Responses provides guidelines for the sorts of responses to look for. Working with students provides teaching support.

These resources tend to have been published since 2003.

### **Resources that could potentially focus on NOS**

These ARB resources were not designed to assess NOS, but potentially could do so. These resources tend to be those published before 2003.

You could change the focus of the questions, or add further questions to address an aspect of NOS. There is no support within the resource to do this. We suggest you use other ARB tasks as models, or look at the resources available on Science Online.

## **Science capabilities for citizenship**

The science capabilities promote the idea of science education for citizenship. The capabilities are aligned to the NOS themes. They model an approach for addressing NOS in science experiences in the classroom.

Five capabilities have initially been identified:

- **Gather and interpret data:** Learners make careful observations and differentiate between observation and inference. Read more.
- **Use evidence:** Learners support their ideas with evidence and look for evidence supporting others' explanations. Read more.
- **Critique evidence:** Not all questions can be answered by science. Read more.
- **Interpret representations:** Scientists represent their ideas in a variety of ways, including models, graphs, charts, diagrams and written texts. Read more.
- **Engage with science:** This capability requires students to use the other capabilities to engage with science in “real life” contexts. Read more.

Find out more about science capabilities.

## **Locating ARB resources that address science capabilities**

Use the science capability you want to assess as a keyword.

For a wider search, use the keyword capabilities.

You can also go to the science capabilities website to find examples of how to adapt existing resources.

Please note that we are working to increase the number of ARBs connected to the science capabilities. These assessment resources are added to the science bank as they are completed.

### **Resource List**

- Food of wild cats
- Travelling sound
- Meat-eating and plant-eating dinosaurs
- Thinking about velociraptors
- Insect or spider?
- Investigating plastic
- Lighting

- Baked Alaska
- Wind farms
- The monarch: chrysalis to butterfly
- Pigeon milk
- Rolling cars
- ARBs and the Science capabilities at Level 1 and 2
- Science capabilities and ARBs map

Published on *Assessment Resource Banks* (<https://arbs.nzcer.org.nz>)