



LEVEL	1	2	3	4	5
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Attractive Magnets

THE LEARNING CONTEXT

The teacher's intended outcomes were for the students to:

- report their observations using drawings and labels
- investigate the properties of magnets.

The intended outcomes were aligned to the following "big ideas":

- Scientists present their findings in appropriate ways.
- Magnets have physical properties which can be observed and investigated.

The teacher developed a classroom programme that enabled the class to explore a concept (magnetism) that can not be directly observed but the effect of the phenomena can be felt or seen.

The teacher established what the class knew about magnets (see Summer's initial ideas). Then they explored and investigated the properties of magnets through a variety of activities, and identified questions and ideas to discuss.

Finally they recorded the results of their investigations (see What I found out, by Summer and What I found out, by Nicholas).

Teacher-student conversation

Summer explains her discovery:

Teacher: Tell me about the magnets in this drawing.

Summer: They can be all different shapes and different strengths. They might start off strong but not stay that way.

Teacher: What's happening with these Ns and Ss?

Summer: If you put the Ns together they push away and if you put the Ss together they push away but if its N and S they stick. They attract.

WHERE TO NEXT?

To move Summer and Nicholas towards the next learning step, the teacher could help them to focus on:

- using the correct scientific terms when labelling their diagrams (investigating in science)
- developing an understanding of the properties of magnets and how these properties can dictate the use of items. For example, a strong magnet is not required to hold a message on a fridge but it is necessary for a magnetic catch to hold a door closed (developing and communicating scientific understanding).

The teacher could:

- model how to evaluate their investigative processes and show them how to identify strengths and weaknesses (investigating in science)
- show students how to make links between the properties of materials and their uses in the next unit on the material world (developing and communicating scientific understanding).

CURRICULUM LINKS

Science in the New Zealand Curriculum

Achievement Objectives

Level 2: Making Sense of the Physical World

Students can investigate and describe their ideas about everyday examples of physical phenomena.

Science in the New Zealand Curriculum, page 74

http://www.tki.org.nz/r/science/curriculum/p74_75_e.php

Levels 1 and 2: Developing Scientific Skills and Attitudes

Reporting: Students can share what they did and what they found out in their investigations in whole class situations or in groups.

Science in the New Zealand Curriculum, page 47

http://www.tki.org.nz/r/science/curriculum/p44_51_e.php

Level 2: Making Sense of the Nature of Science and its Relationship to Technology

Students can use a variety of methods to investigate different ideas about the same object or event.

Science in the New Zealand Curriculum, page 28

http://www.tki.org.nz/r/science/curriculum/p28_29_e.php

REFERENCE

Ministry of Education (1993). *Science in the New Zealand Curriculum*. Wellington: Learning Media.



LEVEL 1 2 3 4 5

Attractive Magnets

WHAT THE WORK SHOWS

Summer and Nicholas develop an understanding of the properties of magnets through a classroom programme of exploration and investigation. Their work shows they have a sophisticated understanding of concepts but do not have the writing skills to convey them clearly.

What is a Magnet?

A Magnet has a magnetic feled which makes a magnet stick to something thats like a magnet for icsameill ^{example} a magnet can stick to a white board.

Summer's initial ideas

Transcript of student work

What is a Magnet?

A Magnet has a Magnetic feled Which makes a magnet Stick to Something thats like a magnet For icsampill a magnet can Stick to a White board.

What Does It Do?

A Magnets has North and a Saoth end.

Here are Some Magnets...

Magnets have different sizes and different shapes

Magnets have different strengths They can lose their strength

Magnets have different sizes and different shapes

Blue Red

They attract some metals They have the same things in them

The ends push away if put N together. If put s together they'll also push away But they attract when you put S and N together

What I found out, by Summer

Transcript of student work

What Does It Do?

A Magnets has North and a Saoth end. Here are some Magnets...

Magnets have different sizes and different shapes.

They attract some metals. They have the same things in them.

Magnets have different strengths. They can lose their strength.

The ends push away if put N together. If put S together they'll also push away. But they attract when you put S and N together.

What Does It Do?

attracts some metal

atrecs Metall

Magnets do not pick up everything only some metals

The ends are pulling together when they are N and S.

The ends push away when they are the same

What I found out, by Nicholas

Transcript of student work

What Does It Do?

atrecs Metall attracts some metal

The ends are pulling together when they are N and S.

The ends push away when they are the same.

Magnets do not pick up everything only some metals



LEVEL 1 2 3 4 5

Attractive Magnets

Progress Indicator Investigating in Science

At the beginning of the unit Summer makes links to previous experiences.

Exploring a situation

After exploring and undertaking trials with a variety of magnets, Summer *makes observations* about the reasons that some objects are attracted to the magnet, "they attract some metals, they have the same things in them", *and looks for patterns or relationships* when like or opposite poles are placed together (see What I found out, by Summer).

Processing and interpreting

Nicholas observes, "Magnets have different strengths. They can lose their strength." He shows he can *reach conclusions to simple investigations linked to his own understanding* (see What I found out, by Nicholas).

Reporting

After investigating the properties of magnets, Nicholas is able to demonstrate clearly his understanding of the forces of attraction and repulsion through reporting *on some or all of his investigations in an organised way*. He uses diagrams and symbols to support his written comments.

Progress Indicator Developing and Communicating Scientific Understanding

Using scientific ideas in constructing explanations

Summer *offers explanations for experiences using some scientific ideas*, "They can lose their strength".

Using scientific vocabulary

Nicholas shows an understanding of the scientific ideas of a force field between the magnets in his diagrams and *experiments with vocabulary and uses correct labels to describe experiences*, "The ends are pulling together when they are N and S. The ends push away when they are the same".

Reflecting on their understanding

Both Nicolas and Summer are able to *describe changes in their own understanding*, with prompting, as shown by the teacher's written comments on the students' work.