



LEVEL 1 2 3 4 5

Water and Ice

THE LEARNING CONTEXT

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

- participate in a shared investigation and make their own observations
- offer explanations for observations they have made.

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

- We find things out from our own observations.
- In science we try to explain the changes we observed.

The class were investigating water and ice. The teacher began with a class discussion on water and she recorded the students' responses to the following questions:

- What is water?
- What can we do with water?
- What does water feel like?
- Where do we find water?

They discussed, observed, and explored the properties of ice and the teacher recorded the students' ideas as they discussed what an ice cube is. She encouraged them to record their findings as part of the process of investigation.

In the following activities, the class:

- watched and listened to ice cubes melting
- used a feely bag to explore the ice
- observed what happened to ice in water
- predicted, then observed what happened to the ice when struck with a hammer.

The teacher recorded their responses to most activities and formatted them into a working big book for them to refer to throughout the study. Finally, the class and teacher evaluated their investigations, and suggested other questions that they could explore.

Teacher-student conversation

This conversation reveals Te Moana's understanding of the scientific ideas involved in the investigation.

Teacher: What is this made of?

Te Moana: Water. Frozen water. We put the pot in the freezer and it comes out like that [points to cube shape].

Teacher: What does it feel like?

Te Moana: It's hard and cold. It's melting. It's making a puddle.

WHERE TO NEXT?

To move Te Moana and Jermaine to the next learning step the teacher could help them focus on asking questions about ice melting, which could lead to explaining what causes ice to melt (investigating in science).

The teacher could do this by encouraging Te Moana and Jermaine to suggest ideas for further investigations, such as how to melt ice quickly in order to drink it. This could lead to a whole class investigation (investigating in science).

CURRICULUM LINKS

Science in the New Zealand Curriculum

Achievement Objectives

Level 1: Making Sense of the Material world

Students can explore simple physical properties and use them to describe and group everyday materials.

Science in the New Zealand Curriculum, page 90
http://www.tki.org.nz/r/science/curriculum/p90_91_e.php

Levels 1 and 2: Developing Scientific Skills and Attitudes

Information gathering: Students can talk about their observations and measurements.

Science in the New Zealand Curriculum, page 45
http://www.tki.org.nz/r/science/curriculum/p44_51_e.php

Levels 1 and 2

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

Science in the New Zealand Curriculum, page 28
http://www.tki.org.nz/r/science/curriculum/p28_29_e.php

Level 1: Making Sense of the Nature of Science and Its Relationship to Technology

Students can share and compare their emerging science ideas.

Science in the New Zealand Curriculum, page 26
http://www.tki.org.nz/r/science/curriculum/p26_27_e.php

Te Whāriki

Strand 4: Communication

Goal 2

Children experience an environment where they develop verbal communication skills for a range of purposes.

Te Whāriki: He Whāriki Mātauranga mō ngā Mokopuna o Aotearoa/Early Childhood Curriculum, page 76–77

Strand 5: Exploration

Goals 3 and 4

Children experience an environment where they learn strategies for active exploration, thinking, and reasoning.

Children experience an environment where they develop working theories for making sense of the natural, social, physical, and material worlds.

Te Whāriki: He Whāriki Mātauranga mō ngā Mokopuna o Aotearoa/Early Childhood Curriculum, page 88–92

REFERENCES

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

Ministry of Education (1996). *Te Whāriki: He Whāriki Mātauranga mō ngā Mokopuna o Aotearoa/Early Childhood Curriculum*. Wellington: Learning Media.

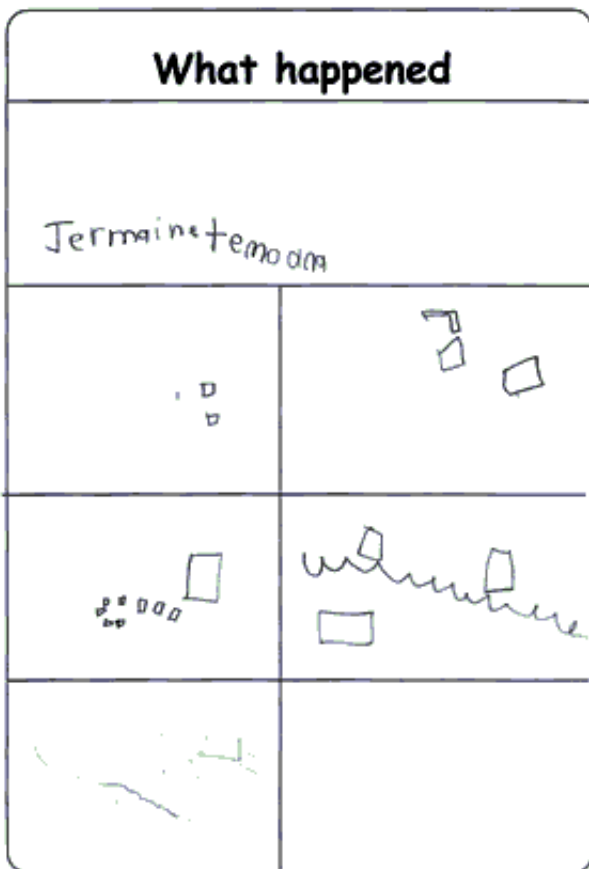


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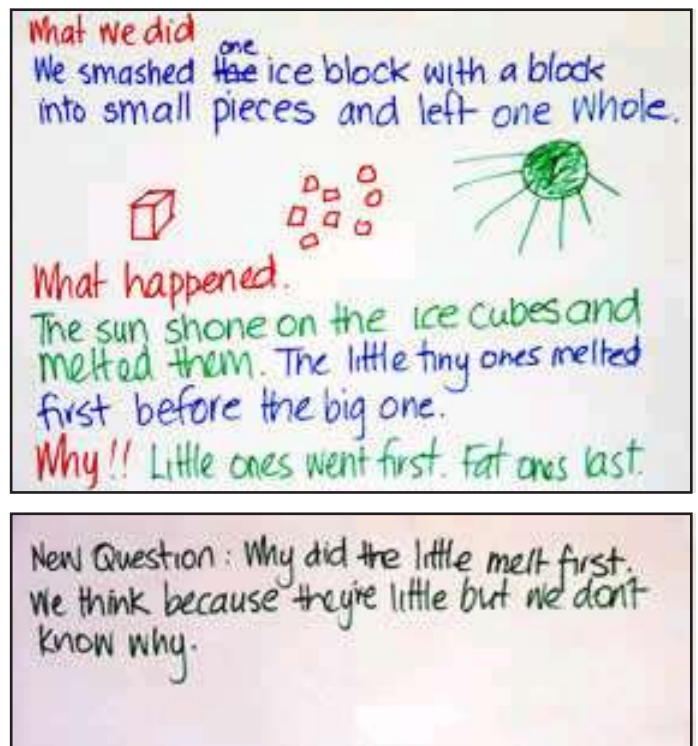
Water and Ice

WHAT THE WORK SHOWS

Te Moana and Jermaine's drawing of ice melting and the teacher's recording of their oral explanation shows the disparity between their scientific understanding and their recording skills.



Drawings by Te Moana and Jermaine



Te Moana and Jermaine's explanation

Progress Indicator Investigating in Science

Processing and interpreting

Te Moana and Jermaine, with prompting, recognise similarities and differences to reach conclusions to a simple investigation on how ice melts.

Making predictions

With encouragement Te Moana and Jermaine ask a new question. "Why did the little melt first?" and say what they think will happen in simple investigative situations.

Progress Indicator Thinking in Scientific Ways

Suggesting explanations

Te Moana and Jermaine offer a simple explanation for an observation or event when they explain how the ice melted.

Comparing and evaluating explanations

Te Moana and Jermaine recognise that other people may have different ideas and that they do not have an explanation when they make the prediction, "we think because they're little but we don't know why".