

Mini Listen: Breaking the Ice

SCIENCE
ALIVE

What's that sharp crack echoing through the frozen air? When water freezes, it can create strange and surprising noises as it shifts, expands, and fractures. This mini is perfect for sparking curiosity about science topics like states of matter, temperature, sound, and icy environments.

LISTEN:

1. Āta whakarongo (listen carefully) to the sound clip.
2. Ākonga use their rongo (senses) to observe the sound. Consider:
 - What sounds can you hear?
 - Is the sound loud or quiet? Sharp or soft?
 - Does the sound stay the same or change?
 - What do you notice about the timing of the sounds – are they random or regular?
3. Pause the clip to discuss learners' observations (you might choose to write these down).
4. Encourage ākonga to use precise language to describe what they observe, rather than inferences or opinions, and use questioning to help them focus on the details.

PREDICT:

1. Ākonga predict what they think the sound might be.
2. Ask learners to give reasoning with 'I think the sound is... because I notice...'
3. Play the video through to the end to reveal the sound source.
 - Was the sound what you expected? Why or why not?
 - Where in the natural world might you hear sounds like this?
 - What might be causing the ice to make that sound?

Science Alive Learning Portal

This printable supports an online resource found on the Science Alive learning portal.

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DISCUSS:

During discussion:

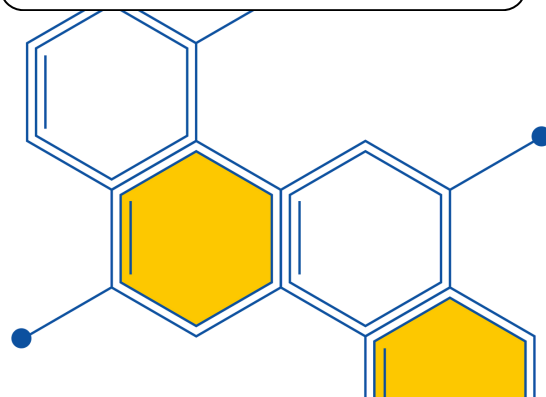
- Do you think this sound was made by something natural or human-made? What makes you think that?
- How does the sound make you feel?
- Does the sound remind you of anything?

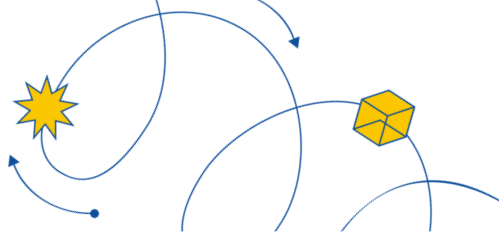
Reflecting:

- What clues helped you make your guess? What senses did you use?
- What made it tricky to figure out?
- How do you think temperature affects the ice and the sound?

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www.nzase.org.nz



**DISCOVER THE SCIENCE:**

Ice forms when liquid water or water vapour cools to **0°C or below** and freezes into a **solid state**. Water molecules are **always moving** because they have **potential energy**. They move **quickly in liquid form** but **slow down** as they cool down and **lose energy**, locking into a **solid structure** and forming **ice**. Unlike most substances, **water expands as it freezes**, making ice **less dense** than water and allowing it to **float**. We see ice in many places—on frosty mornings, in snow, glaciers, frozen lakes, and even in freezers.

Ice cracks and makes sound mainly due to **changes in temperature**. As the air **warms or cools**, the outer layers of the ice **expand or contract** more quickly than the colder layers inside. This uneven movement causes **stress**, which can lead to **cracking and deformation**. When that stress is suddenly released, it creates **vibrations** that **travel through the ice** and into the air as creaks, groans, or sharp cracking sounds. Ice can also crack when it's pushed by **natural forces** like wind or waves.

COMMON MISCONCEPTIONS:

Students' prior knowledge can help them connect with new ideas, but it can also lead to misconceptions if their earlier understanding is inaccurate. Below are some possible misconceptions that may arise from the images used in this mini:

"Only melting ice makes the cracking sound."

The Science: Cracking sounds can happen both during freezing (as water expands and stresses form) and during melting (as tension is released).

"Only cold environments like Antarctica have cracking ice."

The Science: Ice cracking can be heard in many places — including lakes, rivers, glaciers, and even freezers!

"Sound only travels through air."

The Science: Sound can travel through solids (like ice), liquids, and gases and often travels faster and further through solids and liquids than through air.

"Cracking ice means it's unsafe or breaking apart."

The Science: While the cracking of ice can mean it's breaking or weakening, these sounds aren't necessarily dangerous. They often happen as the ice expands and contracts with temperature changes.



Connect: Breaking the Ice

SCIENCE
ALIVE

SOCIAL SCIENCES



Younger ākonga could explore places in Aotearoa or the world where ice naturally forms—such as glaciers, frozen lakes, or Antarctica. Locate these on a map and talk about what people might wear, eat, or do in these cold environments.

Older learners could look at [NASA's Global Ice Viewer](#) and investigate how climate change is affecting glaciers and sea ice, and how this impacts communities. Present findings through a poster, slideshow, or news-style report.

THE ARTS



Younger tamariki could create "cracked ice" artwork by drawing patterns with white crayon on paper, then painting over them with cool watercolour paints (blues, purples). Watch the cracks appear like magic!

Older ākonga could use instruments or digital tools like GarageBand or Chrome Music Lab to create a layered soundscape that captures the pitch, tempo, and texture of different ice sounds.

LITERACY



Junior ākonga could write a class poem describing the sounds and feelings of cracking ice. Use lots of onomatopoeia and adjectives!

Older tamariki could write a short descriptive paragraph imagining what it would be like to stand on cracking ice. Focus on sensory language—What do they hear? Feel under their feet? What do they imagine is happening below the surface?

FUTURE FOCUS



The skills and knowledge developed in this mini could inspire learners to explore pathways beyond the classroom! If your ākonga were engaged in this activity, it could be a great opportunity to connect with experts or someone from your local community to learn more. You could also explore the skills and school subjects involved in some of the related careers listed below:

- Glaciologist
- Cryosphere Scientist
- Climate Scientist
- Expedition Leader of Polar Environments
- Environmental Scientist