Mini Listen:
Rumble Reveal

SCIENCE ALIVE

What's that rumbling sound in the sky? Thunder and lightning are powerful weather phenomena that light up our skies and shake the air around us. This mini is perfect for sparking curiosity about science topics like weather, types of energy, light, and sound.

LISTEN:

1. Āta whakarongo (listen carefully) to the sound clip.
2. Ākonga use their rongo (senses) to observe the sound. Consider the following pātai (questions):
   - What sounds can you hear?
   - Is the sound loud, soft, sharp, low, long or short?
   - Does the sound stay the same or change?
   - Can you hear any other sounds in the background?
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?
   - Has seeing the image changed your thinking or understanding?
   - How does sound help us understand what's happening around us?

DISCUSS:

During discussion:

- Does the sound seem close or far away? 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?
- If you could only hear a storm and not see it, what might you miss?
- Why do you think thunder and lightning often happen together?

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NZASE New Zealand Association of Science Educators

DISCOVER THE SCIENCE:

Thunder and lightning are caused by the **movement of energy (pūngao)** in storm clouds. In **cumulonimbus clouds,** rising warm air leads to the **formation of ice crystals and hail,** which **collide and separate** electrical charges—**negative at the base** (falling hail) and **positive at the top** (lighter ice crystals). When the **charge difference becomes too great,** they **connect** suddenly and **release an electrical current,** seen as a flash of lightning. This lightning strike can occur **within a cloud** (intra cloud Lightning) or **between the cloud and the ground** (cloud to ground lightning).

The lightning **rapidly heats the air,** creating a **shock wave** we hear as thunder. Because **light travels faster than sound,** we see the lightning **before** we hear the thunder.

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:

"Thunder and lightning happen at the same time."
The Science: Lightning comes before thunder—we just see it faster because light travels faster than sound. Thunder is the sound of lightning heating the air, which we can hear later.

"Thunder is the sound of clouds bumping into each other."
The Science: Thunder is actually caused by the rapid expansion of air around a bolt of lightning, not from clouds colliding.

"Lightning never strikes the same place twice."
The Science: Lightning can and will strike the same place twice, whether that is during the one thunderstorm, or on different days across different years!

Connect:
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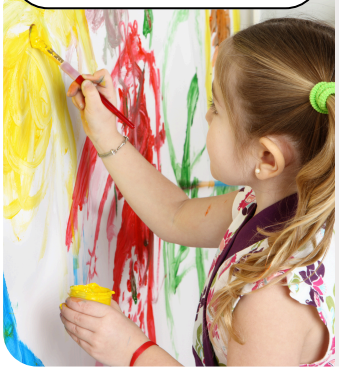
MUSIC

Younger ākonga could be intrigued by the sounds of a thunderstorm. As a class or in small groups, you could try to recreate the sounds of a thunderstorm by making a soundscape using body percussion (e.g., finger tapping for rain, clapping for thunder, stomping for lightning crashes).

Older ākonga could explore dynamics, pitch, and tempo to express different storm elements and use a digital audio editor (e.g. GarageBand) to create a realistic thunderstorm soundtrack.

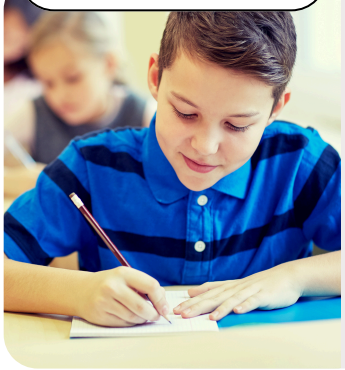
VISUAL ART



Younger tamariki could create rainbow lightning artwork using paper, food colouring, and a water spray bottle. Display your artwork on the classroom wall!

Inspired by artists like Roy Lichtenstein, older ākonga could create comic-style pop art showing the different moments in a thunderstorm (e.g., the build-up, the lightning strike, the aftermath). Include onomatopoeia like BOOM! and CRACK!.

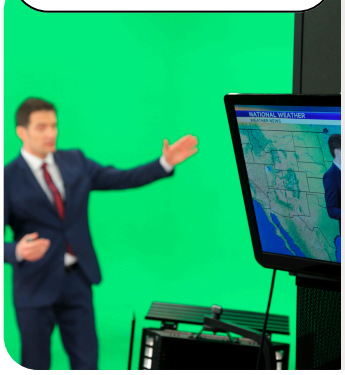
LITERACY



Junior ākonga could write a simple poem or sentence describing what thunder sounds like or how a storm feels, then illustrate it. Combine the pages to create a class book of storm sounds and feelings.

Senior learners could read this article on thunderstorm safety, then write and perform a TV or radio weather report describing an incoming thunderstorm. Include scientific weather terms, safety warnings, and a dramatic delivery.

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:

- Meteorologist
- Lightning Protection Installer
- Fulminologist
- Geophysicist