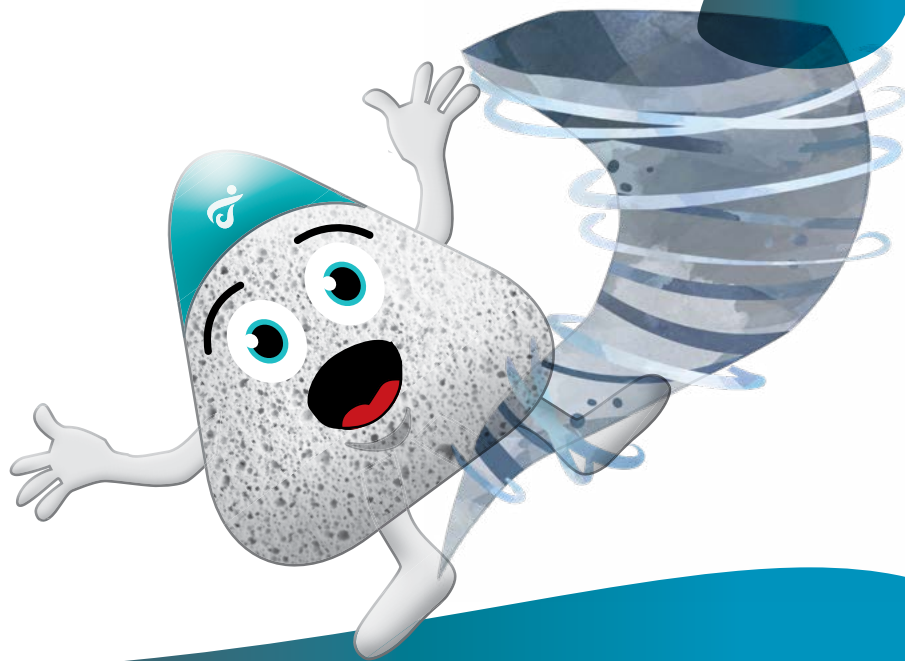


BEACH
WATER SKILLS FOR LIFE

WEATHER & TIDES

MODULE

5



6 LESSONS

LEVEL 4



SUPPORTED BY



He Kaupare. He Manaak
He Whakaora.
prevention. care. recovery

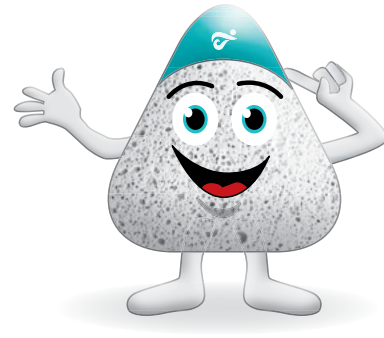


WEATHER & TIDES

DESCRIPTION

This module provides information about weather, climate, tides, and changing sea levels. Students also look into the effects of global warming and climate change.

Matariki is a Māori name for a star cluster which appears in the early morning sky in New Zealand during the mid-winter months. Historically, these stars were closely tied to planting, harvesting and hunting. If the stars appeared clear and bright, it signified an abundant season ahead. Fishing and planting food by the way of the moon, the tides, and the elements is still common today.



ACHIEVEMENT OBJECTIVES

Science

Nature of Science

Understanding about science:

Appreciate that science is a way of explaining the world and that science knowledge changes over time.

Communicating in science:

Begin to use a range of scientific symbols, conventions, and vocabulary.

Living World

Ecology: Explain how living things are suited to their particular habitat and how they respond to environmental changes, both natural and human-induced.

Planet Earth and Beyond

Earth systems: Develop an understanding that water, air, rocks and soil, and life forms make up our planet and recognise that these are also Earth's resources.

Astronomical systems:

Investigate the components of the solar system, developing an appreciation of the distances between them.

Personal Health and Physical Development

Safety and Risk Management: Access and use information to make and action safe choices in a range of contexts.

Healthy Communities and Environment

Rights, Responsibilities and Laws:

Learn about individual responsibility and take collective action for the care and safety of other people in their school and in the wider community.

English

Listening, Reading and Viewing

Processes and strategies:

Integrate sources of information, processes, and strategies confidently to identify, form and express ideas.

- Integrates sources of information and prior knowledge confidently to make sense of increasingly varied and complex texts
- Selects and uses appropriate processing and comprehension strategies with increasing understanding and confidence

Ideas:

Show an increasing understanding of ideas within, across and beyond texts.

- Makes meaning of increasingly complex texts by identifying and understanding main and subsidiary ideas and the links between them
- Makes connections by thinking about underlying ideas within and between texts from a range of contexts

Language features:

Show an increasing understanding of how language features are used for effect within and across texts.

- Identifies oral, written, and visual features used and recognises and describes their effects
- Uses an increasing vocabulary to make meaning

LEARNING INTENTIONS

- Gain a stronger understanding of the difference between weather and climate
- Gain a stronger understanding of what influences tides and why we care about them
- Make the connection between climate, sea-level rise, water level changes, and tides
- Understand how changing water levels affect our coastal communities

SUCCESS CRITERIA

- Students will understand the types of tides
- Students will understand the cycle of the tides
- Students will understand the significance and impact of the moon and tide
- Students will describe some of the causes of the different types of tides

KEY COMPETENCIES

Participating and Contributing

- Actively participate in class activities, discussions and group projects

Managing Self

- Manage behaviour in whole class, group and individual activities
- Have a positive work ethic
- Complete work to the best of my abilities

Thinking

- Evaluate information for its overall reliability and effectiveness
- Apply new information and concepts to present and future events

Using language, symbols and texts

- Search for key information using a range of sources
- Research and gain understanding of new vocabulary
- Decipher symbols on a Lunar Calendar to help find information

Relating to others

- Respect the ideas and opinions of others
- Work effectively as a group member towards a common goal

RESOURCES

Internet; TV/ active board; YouTube clips;
Student devices; tides vocabulary game; articles:
Earth Science for kids: Ocean Tides, Nights in the
Maramataka | the Māori lunar month; What's the
difference between weather and climate? posters
(enough for one between two students).

ASSESSMENT ACTIVITIES

- Class discussions
- Draw and label a diagram explaining the Moon's impacts on the Earth's tides
- Tides Kahoot quiz

LESSON

1

Weather, Climate and The Tide

Explain to the students that they will be learning about the weather climate and tides; their impacts on the Earth and how we live.

Ask the students: What do you know about weather? What do you know about climate? What do you know about tides? What types of tides are there? How does weather affect the tide? How does climate affect the tide?



Ask the students to read the [What's the difference between weather and climate?](#) NASA kids poster in pairs and develop a short paragraph in their own words that summarises what the difference between weather and climate is. **Ask** a few students to read their paragraphs with the class and discuss whether they agree or disagree with each other's summaries. **Work together** to develop an agreed upon summary to help clarify this concept for students.

Ask the students: Since the weather is always changing, what impact do you think weather can have on the tides? **Ask** students to discuss this with their peers and then share their ideas/theories with the class. **Watch the video** [How The Weather Affects The Tide](#). **Ask** the students to explain their new understanding of how the weather impacts on the tides.



LESSON

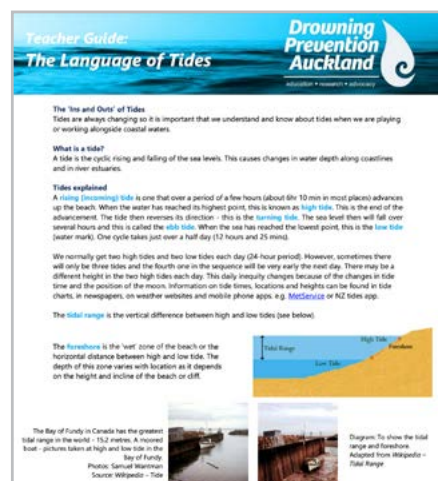
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to
4

Tides

Review the previous lesson with the class about the weather's impacts on the tides.

Ask the students: What causes the tides to happen? How many types of tides are there? How often do tides change per day? Record students' responses. **Watch** the video [Ocean's Tides Explained](#) and discuss the science concepts explained on the video. Review students answers to the initial prior knowledge questions and give them a chance to change or add to their ideas.

Explain to the students that it is not only the moon that has an impact on the tides, but also the sun. There are two tides in particular that are different from ordinary low and high tides. These tides are extremely high (Spring) and extremely low (Neap) tides. **Watch the video** [Space Science Tutorial: Spring and Neap Tides](#) and discuss the science concepts explained on the video. Additional resource: [Teacher Guide Language of Tide Guide](#).



ASSESSMENT ACTIVITY: Tides Diagram

Ask the students to draw a diagram demonstrating their understanding of the impacts of the sun and the moon on the Earth's tides. **Encourage** the students to label their diagram clearly and then verbally explain their diagram to another student or the teacher.

ACTIVITY: Vocabulary Game

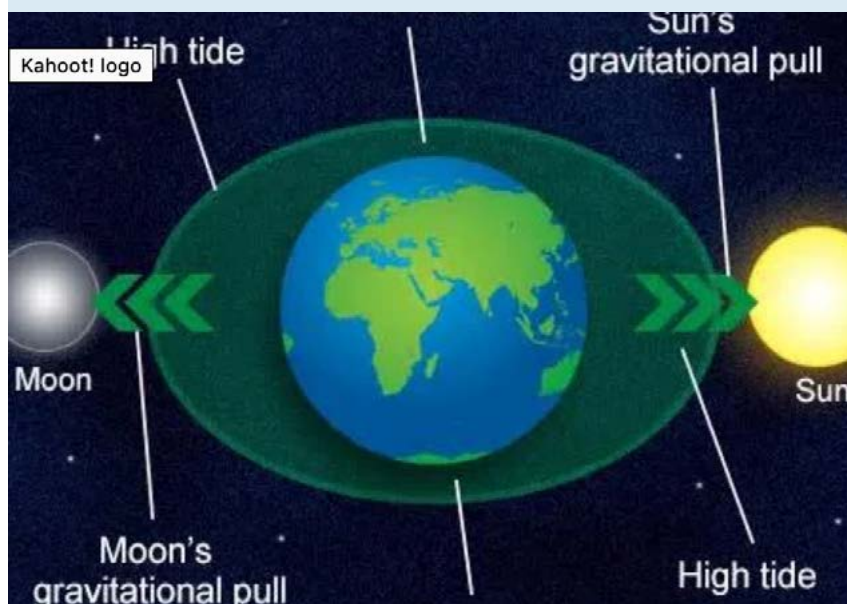
Split the students into groups of 3-4. Give students the following [Vocabulary Game](#) cards containing key vocabulary specific to tides and ask them to match each word with its definition. Once complete, ask the groups to share their results, encouraging students to partake in a friendly debate when other groups have differing results.

ACTIVITY: Article and Quiz

Ask the students to read the [Earth Science for kids: Ocean Tides article](#) and complete the quiz to help them further develop their understanding of ocean tides. Ask the students to share the results of their quiz with the teacher by either physically showing them or screenshotting the results.

ACTIVITY: Tides Kahoot!

Play [Tides Kahoot!](#) as a whole class activity to test students' overall knowledge about tides.



LESSON

5

Tides, the moon,
Matariki and kai collection

Explain to the students that for centuries Maori and other cultures have used the Moon, Stars and Tides to help with the planting/harvesting of crops and gathering of kaimoana. Before the introduction of the Gregorian Calendar, Maori measured time using the Lunar Calendar and the stars (e.g. Matariki - the Pleiades star cluster).

The Lunar Calendar (also known as Maramataka) which uses the phases of the Moon to map the days over the course of a month (30 days), is still used by many today for fishing and planting food. The tides and other elements also contribute to this concept as well as the Maori New Year – Matariki.

Read the [Nights in the Maramataka](#) | the Māori lunar month together as a class and discuss the key information around how to use the Moon phases to guide kai planting and gathering. Also show the students this [Maori Fishing Calendar](#) to demonstrate a modernised version of the Lunar Calendar and how it is used to fish.

Maori Fishing Calendar

To calculate the Tide Times for your favourite fishing spots click here.

Fishing Calendar for: June 2021

Select a different month to view: June 2021 Show

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
	01	02	03	04	05	06
07	08	09	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				

ACTIVITY: Using the Lunar Calendar

Ask students to use the Lunar Calendar and other information on the [Nights in the Maramataka | the Māori lunar month](#) article to **answer** the following questions.

- What days are good for planting crops?
- What days are good for catching eel?
- What is the symbol that is classified as unlucky for food seeking?
- What is the best tide for gathering shellfish and why?

Nights in the Maramataka | 1 month

Discover the nights in the Māori lunar month, and activities related to them.

The Māori lunar calendar is called the Maramataka, which literally means the turning of the moon. It marks the phases of the moon in a lunar month.

Each night, which also typically marks a day, was given a name and over time each day/night was accompanied by information guiding fishing, gardening, and other activities in the natural world.

During a typical lunar month, some days are noted as being favourable for resource harvesting, whereas other days are known to be unfavourable.



LESSON

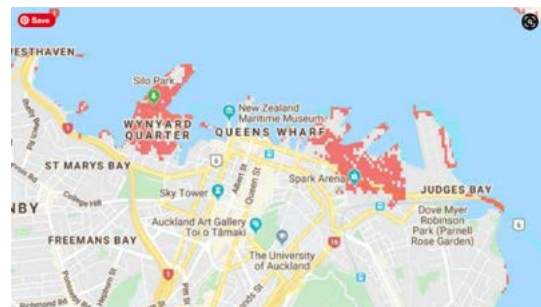
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The impact of sea level rise on our coastal communities

Review lesson one with the students and remind them of the difference between climate and the weather. **Discuss** how the Earth is warming largely due to human activity and the impacts this is having on sea level rise.

Ask the students: What do you think will happen if the sea level rises? What do you think will be at risk if it rises? How do you think this will affect the tides? How will the sea level rise affect people who live at the beach?

Read the [Newshub Sea Level Rise article](#) with the students and discuss the predicted changes to some of New Zealand's cities over the next 30 years. Show the students the [Sea Level Rise Map](#) and search the area closest to the school near the coast to demonstrate to students the potential risks involved with the sea level rise. **Discuss** students ideas or any questions they may have about sea level rise and how it may affect them.



ACTIVITY: RESEARCH ONLINE

Ask the students to research ways we can all contribute to lessening global warming and sea level rise. Students must list at least 5 practical things that everyone can do to reverse or lessen global warming.