

Science alive
Mātauranga



**INTERNATIONAL
ANTARCTIC
CENTRE**

Antarctic Adventures

UNIT 1: SEE IT

Teacher Guide

Antarctic Adventures: See It

Look into the past and discover the history of Antarctica. Learn about historical navigation and mapping techniques used by western travellers that lead them to Te Tiri o te Moana, and find out how indigenous peoples, like Māori, used their own environmental guides to voyage around the Pacific in waka hourua. See how travellers explored the icy continent and created the Antarctic Treaty, similar to Te Tiriti o Waitangi, to keep Antarctica protected. Compare the history to navigation and exploration methods used within the 21st century, and explore how huts, waka and collaboration make research in Antarctica possible today!

Curriculum Links

Aligned to Level 4 of the New Zealand Curriculum

Science

- **Nature of Science - Understanding about Science**
Appreciate that science is a way of explaining the world and that science knowledge changes over time.
- **Planet Earth and Beyond - Astronomical Systems**
Investigate the components of the solar system, developing an appreciation of the distances between them.

Social Sciences

- **Social Studies**
Understand how exploration and innovation create opportunities and challenges for people, places, and environments.

Math

- **Geometry and Measurement - Position and Orientation**
Communicate and interpret locations and directions, using compass directions, distances, and grid references.

Literacy

- **Listening, Reading, and Viewing - Ideas**
Students will show an increasing understanding of ideas within, across and beyond texts.

Technology

- **Nature of Technology - Characteristics of Technology**
Understand how technological development expands human possibilities and how technology draws on knowledge from a wide range of disciplines.

Mātauranga Māori

- Basic implementation of te reo Māori vocabulary.
- Brief introduction to pūrākau through Māori narratives.
- Historical Polynesian navigation skills that are centered around environmental cues, including the observation of the sun and stars to guide their voyages.
- Cultural similarities of polynesian voyagers, such as Tupaia from Tahiti or Hui Te Rangiora from Rarotonga, to Māori in Aotearoa.
- The significance of oral knowledge to Māori, and the weaving of this knowledge into haka and waiata to pass on their knowledge, taonga tuku iho, through generations to come.
- Voyage vessels used by Māori, like the waka hourua or double-hulled canoe, which helped their journeys throughout Te Moana-nui-a-kiwa (The Pacific Ocean).
- Introduction to Māori cultural concepts such as mana, manawanui and tiakitanga, giving insight into Te Ao Māori relating to both people and the environment.
- Integration of whakataukī into Māori and Western content, expanding both te reo Māori vocabulary and worldview.
- Introduction to traditional Māori cultural roles.
- The importance of the natural world to Māori, with emphasis on their relationship with animals and te taiao.
- Overview of Te Tiriti o Waitangi in relation to the Antarctic Treaty.
- Highlighting the importance of toi Māori to storytelling through the form of whakairo (wood carving).

Key Competencies

- Thinking
- Relating to others

21st Century Skills

- Creativity
- Critical Thinking and Problem solving

Useful Links!

- Navigation Skills - Making a Sundial Investigation
- Science Learning Hub - See it! Collection
- House of Science Resource Library
- Science Alive Mātauranga Facebook Group
- Science Alive Mātauranga FAQs
- Education Perfect Help Centre

Antarctic Adventures: See It

Discovery

Students will be able to...

- ▶ Identify why humans were interested in visiting Antarctica.
- ▶ Describe the characteristics of Antarctic explorers in the early 20th century.
- ▶ Describe the human impact of early exploration in Antarctica.
- ▶ Identify how Aotearoa honours the Antarctic Treaty.
- ▶ Describe ways humans, animals and equipment travel to Antarctica.

Connection

Students will be able to...

- ▶ Describe different navigational techniques used in early Antarctic exploration.
- ▶ Explain the methods of Antarctic exploration on land in the early 20th century.
- ▶ Explain the purpose of the Antarctic Treaty.
- ▶ Explain modern mapping techniques used in Antarctic exploration today.
- ▶ Explain current areas of exploration in Antarctica.

Application

Students will be able to...

- ▶ Compare and contrast the vessels used by Polynesian voyagers and early Antarctic explorers.
- ▶ Reflect on Antarctic discoveries and how humans began to impact the environment in the early 20th century.
- ▶ Compare and Contrast the Treaty of Waitangi and the Antarctic Treaty.
- ▶ Analyse modern exploration techniques in Antarctica.
- ▶ Analyse the Antarctic tourism industry and its impact on the environment.



Description

Learning Objectives

Key Concepts & Skills

Follow Up Activities

What Lies South? Discovering Antarctica

Find out about early navigation techniques used by master navigators such as Tupaia and Cook as they made their way to Aotearoa!

Explore different vessels and how these wayfinders used their environment and navigation equipment to explore the world and find out exactly what lay south beyond the horizon!

- Identify why humans were interested in visiting Antarctica.
- Describe different navigational techniques used in early Antarctic exploration.
- Compare and contrast the vessels used by Polynesian voyagers and early Antarctic explorers.

- Understanding a hypothesis.
- Interpreting the environment and specialised equipment helped early explorers navigate the world in many ways.
- Records of early exploration differed between cultures eg. maps, chart, oral stories and waiata.
- Map reading using latitude and longitude.
- The structure of different vessels such as the HMS Endeavour and waka hourua.

- Compare the hypothesis of Early Europeans of 'What lies south?' to concrete evidence using maps and charts.
- Research a piece of early navigational equipment used by Early European or Polynesian wayfinders. Create a clearly labelled diagram with an explanation of how the instrument works.
- Write a diary entry from the perspective of an explorer on the HMS Endeavour or a waka hourua. Conduct research and take note of the technology available at the time as well as the environment around you!

Heroic Explorations in Antarctica

What makes an explorer tick? Who won the race to the South Pole? Follow some key explorers to Antarctica and learn about the challenges they faced.

Once humans had reached Antarctica, how did they get around? What did they need to survive? Peek inside the huts frozen in time on Antarctica and get a sense for their experiences we learn more about their stories.

- Describe the characteristics of Antarctic explorers in the early 20th century.
- Explain the purpose of the Antarctic Treaty.
- Reflect on Antarctic discoveries and how humans began to impact the environment in the early 20th century.

- Values and skills that drove early explorers.
- Expedition purposes varied between cultures.
- Preparation for expeditions to an extreme environment.
- The journey of those explorers racing to the South Pole.
- Forms of transport in Antarctica developed over time due to the extreme environment.
- The value of Indigenous knowledge for exploration.
- Human impact on Antarctica ecosystems and environment.

- Present a biography of an Early Antarctic Explorer by conducting your own research.
- Design your own Antarctic hut using the information within the lesson about the environment in Antarctica. Design online or on paper! Clearly label your design.
- Draw your own Early Antarctic Explorer: think about equipment, clothing and environment that would have been available. Describe your character or write a story about them!

Treaties in Antarctica

What is a treaty?

How does it bring people together?

Learn about the impacts of exploration and the importance of scientific research in Antarctica.

Unpack the concept of Tiakitanga and how the Antarctic Treaty aims to protect Te Tiri o Te Moana and allow peaceful scientific collaboration for all.

- Describe the human impact of early exploration in Antarctica.
- Describe different navigational techniques used in early Antarctic exploration.
- Compare and Contrast the Treaty of Waitangi and the Antarctic Treaty.

- Tiakitanga means to protect and care for others now and in the future.
- Scientific research and exploration began to leave its mark on Antarctica.
- International Geophysical Year Science programme goals and outcomes.
- The purpose of treaties.
- The goals of the Antarctic Treaty.

- Debate! Choose whether you agree or disagree with the statement 'School should have no rules!' Try and persuade your audience to agree with you. Remember to include examples or evidence for your reasons.
- Create a treaty for your classroom. Gather ideas from the class and agree on some key ideas, rules and guidelines to help everyone in the class enjoy their time together.
- Conduct your own research on the concept of tiakitanga. How does your school show tiakitanga or kaitiakitanga and in what ways? Can you record some examples?

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Follow Up Activities

21st Century Antarctica: Mapping and Navigation

How does Aotearoa honour the Antarctic treaty?
Relate the goals of the Antarctic Treaty to Te Ao Māori!

Learn about the technological advancements for mapping and navigation in Antarctica and how they are used to aide current scientific research.

- Identify how Aotearoa honours the Antarctic Treaty.
- Explain modern mapping techniques used in Antarctic exploration today.
- Analyse modern exploration techniques in Antarctica.

- Whakairo is a way to represent ideas and explain traditions.
- Aotearoa and the concepts of tiakitanga and kaitiakitanga as ways of honouring the Antarctic Treaty.
- Purpose and features of satellites and their use in modern mapping.
- Global Positioning Systems (GPS) and its use in modern Mapping.
- Navigational technology in Antarctica such as Hāgglungs.

- Create your own whakairo design depicting the environment where you live. Can you communicate the history or the challenges through your carving drawing?
- Create an informative poster educating people on the terms of the Antarctic Treaty. Be sure to include the main ideas of the treaty and give examples of how Aotearoa meets the agreement.
- Invent a vehicle/vessel/machine to help modern explorers navigate the Antarctic environment. Make sure you add labels and descriptions.

21st Century Antarctica: Exploration and Tourism

How does a holiday in Antarctica sound?
Discover how people get to Antarctica in the 21st century. Find out about current research in Antarctica and how technology helps explorers and researchers get around the ice!

Find out about the tourism industry in Antarctica and how visitors benefit from their experience.

- Describe ways humans, animals and equipment travel to Antarctica.
- Explain current areas of exploration in Antarctica.
- Analyse the Antarctic tourism industry and its impact on the environment.

- Technology and travel.
- The importance of kaitiakitanga and tourism.
- Forms of transport in Antarctica have developed over time.
- Purposeful research being undertaken in Antarctica.
- Tourism benefits and management techniques.

- Create an advertisement for one the gateway cities to Antarctica. Highlight the reasons why people should visit Antarctica and what they should be aware of.
- Design an infographic about freedom camping in Aotearoa. You will need to conduct some research to find out the guidelines in your area.
- Conduct your own research into what our Kiwi scientists are doing in Antarctica at the moment. Find out about their research and present your findings in an interesting way.

