SCIENCE ON ICE

An Antarctic Adventure!

Lesson Plan to support Episode 2: Adélie and Emperor Penguins

Contents

WhitebaitMedia
Antarctica New Zealand
NZ On Air Irirangi Te Motu

Curriculum Links
Achievement Objectives

SCIENCE

Nature of Science: Understanding about science, Investigating in science, Communicating in science, participating and contributing

Levels One and Two	Levels Three and Four
Living World – Ecology Life processes • Recognise that all living things have certain requirements so they can stay alive. Ecology • Recognise that living things are suited to their particular habitat. Evolution • Recognise that there are lots of different living things in the world and that they can be grouped in different ways. **Planet Earth and Beyond** Earth systems • Explore and describe natural features and resources. Interacting systems • Describe how natural features are changed and resources affected by natural events and human actions.	**Living World – Ecology** Life processes • Recognise that there are life processes common to all living things and that these occur in different ways. Ecology • Explain how living things are suited to their particular habitat and how they respond to environmental changes, both natural and human-induced. Evolution • Begin to group plants, animals, and other living things into science-based classifications. **Planet Earth and Beyond** Earth systems • Appreciate (L3) / Develop an understanding (L4) that water, air, rocks and soil, and life forms make up our planet and recognise that these are also Earth's resources. Interacting systems • Investigate the water cycle and its effect on climate, landforms, and life.

MATHS

Levels One and Two	Level Three	Level Four
n/a	**Statistics** **Statistical Investigation** Conduct investigations using the statistical enquiry cycle: 1. gathering, sorting, and displaying multivariate category and whole number data and simple time-series data to answer questions; 2. identifying patterns and trends in context, within and between data sets; 3. communicating findings, using data displays.	**Statistics** **Statistical Investigation** Plan and conduct investigations using the statistical enquiry cycle: 1. determining appropriate variables and data collection methods; 2. gathering, sorting, and displaying multivariate category, measurement, and time-series data to detect patterns, variations, relationships, and trends; 3. comparing distributions visually; 4. communicating findings, using appropriate displays.

Key Competencies

- Thinking
- Using language, symbols, and texts
- Managing self
- Relating to others
- Participating and contributing

Learning intentions

- Support the vision of Antarctica New Zealand: Antarctica and the Southern Ocean - valued, protected, understood
- Watch the episode, infer information, reflect and summarise
- Compare two different species of penguin
- Present comparison data visually
- Describe the adaptations that enable penguins to survive in the harsh conditions of the Antarctic

Key Vocabulary

Adélie penguin	type of penguin
banded bird	penguin with a band that is used to identify them
GPS location	Global Positioning System: an electronic system using a network of satellites to indicate position
fisheries	the industry of catching, processing, and selling fish / a fishing ground
colony	a group (of penguins) that live together
skua	a large, brown-and-white, predatory shorebird
guano	poo
weighbridge	a machine for weighing (in this case) penguins
estimate	an approximate judgment or calculation
Emperor penguin	emperor penguin – the largest penguin species
brood pouch	a pouch in which eggs develop and hatch
DNA	a chemical that is found in all living cells. It contains genetic information. DNA is an abbreviation for `deoxyribonucleic acid'
species	a distinct kind of animal, a group of living things that can exchange DNA
instrumented	equipped with instruments
foraging	feeding / the acquisition of food by hunting, fishing, or the gathering of plant matter
Ross Sea	a large arm of the South Pacific in Antarctica, incorporating the Ross Ice Shelf
predators	any carnivorous animal
climate change	refers to changes in the earth's climate, especially the gradual rise in temperature caused by high levels of carbon dioxide and other gases

Lesson Sequence

Activity 1 – Penguin brainstorm

Before watching, students (either on their own or in pairs), write on post-it notes what they know about penguins in Antarctica and on separate post-its, what questions they may have. Collect these on a penguin chart at the front of the class. Watch the episode. Work through the post-its as a class, decide whether you still agree with the statements or amend them as necessary and add further questions. Students can carry out further research to answer those not addressed in the episode.

Alternatively, use the KWL chart from episode 1 with a focus on penguins.
Resource: Ep1, Resource 1 – KWL chart

Activity 2 – Quiz

Copy the quiz for each student and watch the episode again, asking them to complete it as they watch. Alternatively, complete the quiz as a class after watching.

Resource: Ep2, Resource 1 – Quiz

Activity 3 – Venn diagram

Students work individually, or in pairs or groups to complete a venn diagram for the emperor and Adélie penguins, using what they have learnt from the episode as well as what they research separately. Extension: Choose two different species of penguin (not covered in the episode) and compare them.

Resource: Ep2, Resource 2 – venn diagram

> **Extension - Physical dimensions comparison:** Measure your own height and weight. How does this compare to the Adélie and Emperor penguins? Present this information as bar or column graphs. You may also want to include other penguins or even other animals for comparison.

Activity 4 – Penguin presentation

Select a penguin species (students who need more support/scaffolding could use emperor or Adélie and others may choose a new species). Research the penguin and prepare a presentation (poster, Power Point or other) to present to the class.

> **Extension 1 – Penguin adaptations:** Introduce the idea of adaptations enabling animals to survive. These can include the physical features of the animal (structural adaptations), the way the animals behave (behavioural) or the things their body can do (physiological). Survival means avoiding predators, finding food, maintaining body temperature in extreme climates... Students focus their poster on adaptations of a penguin that enable it to survive in its given habitat.

Activity 5 - Imaginary Creature (adaptations)

Students design an imaginary creature that could survive in Antarctic conditions. They will need to include details on the adaptations that enable the creature to keep warm, shelter from wind, find food, evade predators etc. They could produce an annotated diagram of the creature, or a model made from household junk.

These websites give further information about adaptations, including examples of adaptations in a Whio (blue duck):

https://www.sciencelearn.org.nz/resources/2415-whio-adaptations https://www.sciencelearn.org.nz/videos/1670-unique-whio-adaptations

Supporting Resources

School Journals

An Ecologist on Ice by VANCE, Matt
Reading Level: Year 8, Edition: Connected No. 04, Year: 2013, Pages: 10 - 17

Gather Your Data by BARTHOLOMEW, Rex
Reading Level: Year 7, Edition: Connected No. 04, Year: 2013, Pages: 18 - 22

Paper penguins, by BUXTON, Jane - Turn a piece of paper into a penguin in six easy steps.
Reading Level: Year 4, Edition: Part 01 No. 4, Year: 2000, Pages: 25-26

The Emperor of Peka Peka Beach by WILCOX, Sarah
Reading Level: Year 7, Edition: Level 4 Oct, Year: 2012, Pages: 12-19

Books

Penguins by Gail Gibbons
Lost and Found by Oliver Jeffers
National Geographic Kids Penguins
Without You by Sarah Weeks
Playing with Penguins: And Other Adventures in Antarctica by Ann McGovern
Little Penguin: The Emperor of Antarctica by Jonathan London
Antarctic Antics by Judy Sierra
Who counts the penguins? : working in Antarctica by Mary Meinking
I am a Penguin by Barbara Todd
Emperor Penguins by Rachel Walker
10 Plucky Penguins sung by Pio Terei

Websites

https://www.antarcticanz.govt.nz/

https://www.penguinsinternational.org/

https://kids.nationalgeographic.com/animals/birds/adelie-penguin/

http://nzbirdsonline.org.nz/species/adelie-penguin

https://www.wwf.org.uk/learn/fascinating-facts/adelie-penguins

https://kids.nationalgeographic.com/animals/birds/emperor-penguin/

http://nzbirdsonline.org.nz/species/emperor-penguin

https://www.wwf.org.uk/learn/wildlife/emperor-penguins

https://www.coolantarctica.com/Antarctica%20fact%20file/science/cold_penguins.php

Penguin colouring activities: https://www.penguinsinternational.org/wpd-coloring-book/

Brain break -Penguin Dance: https://www.youtube.com/watch?v=uf0uKmKwnKs

Film

March of the Penguins