SCIENCE ON ICE

An Antarctic Adventure!

Lesson Plan to support Episode 3: Sea Slugs and Underwater Spiders

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.

THE ARTS
Visual Arts

Levels One and Two	Level Three	Level Four
Understanding the Arts in Context • Share ideas about how and why their own and others' works are made and their purpose, value, and context. **Communicating and interpreting** • Share the ideas, feelings, and stories communicated by their own and others' objects and images.	**Understanding the Arts in Context** • Investigate the purpose of objects and images from past and present cultures and identify the contexts in which they were or are made, viewed, and valued. **Communicating and interpreting** • Describe the ideas their own and others' objects and images communicate.	**Understanding the Arts in Context** • Investigate the purpose of objects and images from past and present cultures and identify the contexts in which they were or are made, viewed, and valued. **Communicating and interpreting** • Explore and describe ways in which meanings can be communicated and interpreted in their own and others' work.

ENGLISH

Levels One and Two	Level Three	Level Four
Ideas • Select, form, and express ideas on a range of topics **Language features** • Use language features appropriately, showing some understanding of their effects. **Structure** Organise texts, using a range of structures	**Ideas** • Select, form, and communicate ideas on a range of topics **Language features** • Use language features appropriately, showing a developing understanding of their effects. **Structure** • Organise texts, using a range of appropriate structures	**Ideas** • Select, develop, and communicate ideas on a range of topics **Language features** • Use a range of language features appropriately, showing an increasing understanding of their effects. **Structure** • Organise texts, using a range of appropriate structures.

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
- Understand the research areas of different types of scientists.
- Create a model, labeled diagram or scientific drawing of a creature living in the Antarctic ocean
- Recall previous knowledge of Climate Change
- Creatively respond to the work being done in Crary Lab

Key Vocabulary

McMurdo Station	the main United States research station in Antarctica
Crary Science and Engineering Centre	a research laboratory, named in honour of geophysicist and glaciologist Albert P. Crary
glaciologist	a scientist who studies glaciers and other natural phenomena that involve ice
geophysicist	a scientist who studies the Earth by measuring things and collecting data
biology	the study of living things
geology	the study of the Earth and what it is made from
glaciology	the study of glaciers and other natural phenomena that involve ice
atmospheric science	the study of the thin layer of gases that surround the Earth, the atmosphere
nudibranch	sea slug
pycnogonid	sea spider
proboscis	a long, flexible hollow body part. Sea spiders have one they use for feeding
simulated	imitating the real conditions (in this case, of the ocean) in a laboratory, often on a smaller scale
CO2 or carbon dioxide	a colourless gas that is produced by humans, but also by burning fossil fuels
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
microscopic organisms	a living thing only visible through a microscope
food chain	a series of organisms that eat one another
ROV or Remotely Operated Vehicle	an underwater robot that can be moved around by someone outside the water takes high quality photos of the algae on underside of the ice
algae	microscopic organisms that can make food from sunlight. In the Southern Ocean these are the beginning of the food chain

Lesson Sequence

Activity 1: Watch Science on Ice Episode 3

Before watching this, a good introduction may be to have a class brainstorm to find out what types of scientists they have heard of (e.g. marine biologist ...)

Activity 2: What scientist?

Four types of scientists are mentioned in the episode – what do they all do? Biologist, geologist, glaciologist, atmospheric scientist. Discuss as a class. Add these to your class list before (or you can brainstorm a list of scientists here), and research what the different scientists study. Follow up by giving the students the mix and match worksheet, Resource 1.

Resource: Ep3, Resource 1 – Who studies what

Activity 3: Art/craft

Option 1 – Make a sea spider using pipe cleaners. See instructions at https://family.disney.com/craft/ariels-sea-spiders/

Option 2 – Label a diagram of a sea spider and match functions to different parts using the included resource. Cut and paste?

Resource: Ep3, Resource 2 – Label a sea spider

Option 3 – EXTENSION Have a go at doing your own biological drawing. Using Resource 3, guide students through the steps for correctly drawing a biological specimen from a photo.

Resource: Ep3, Resource 3 – Biological Drawings

Activity 4: Climate Change Snowball brainstorm

Students form pairs and discuss for two minutes what they know about climate change. It might be good to make some prompt questions visible, such as

1. What does climate change mean?

2. What causes it?

3. What problems arise from it? etc.

After two minutes, each pair joins with another pair to swap ideas for a further two minutes. Groups of four join with other groups of four and share again, until the whole class is together and all ideas can be shared with the class. (This will be discussed in more detail during Episode 5).

Activity 5: Cinquain poem – a five line poem

Students can create a cinquain poem using the template below. The focus of the poem could be a creature shown in the episode, the Crary Science Lab, Antarctica, the scientists...

Line 1: One word (a noun, the subject of the poem)
Line 2: Two words (adjectives to describe the subject in line 1)
Line 3: Three words (-ing action verbs that relate to the subject in line 1)
Line 4: Four words (a phrase or sentence that relates feelings about the subject in line 1)
Line 5: One word (a synonym for the subject in line 1 or a word that sums it up)

Supporting Resources

School Journals

Who's Eating Who? by WALL, Bronwen
Reading Level: Year 7, Edition: Connected L4, Year: 2012, Pages: 14-21

Science on the Ice by SILVERWOOD, Neil (e-book available)
Reading Level: Year 8, Edition: L4 Nov, Year: 2018, Pages: 8-21

The big chill and the big drill by ALCHIN, Rupert
Reading Level: Year 5, Edition: Connected 1_2, Year: 2008, Pages: 15-20

Books

Weird Sea Creatures - Laura F. Marsh

Websites

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

https://www.coolantarctica.com

https://www.coolantarctica.com/Antarctica%20fact%20file/wildlife/antarctic_animal_adaptations2.php

https://kids.nationalgeographic.com/animals/invertebrates/nudibranch/

https://www.sciencekids.co.nz/sciencefacts/careers.html

https://www.sciencenewsforstudents.org/article/giant-antarctic-sea-spiders-breathe-really-strangely

https://www.wired.com/2014/06/the-creature-feature-10-fun-facts-about-sea-pigs/