

Applicable standards

National Geography Standards, Second Edition

Grades 5-8	Lessons						
	1	2	3	4	5	6	7
Element of the curriculum							
The World in Spatial Terms							
• Standard 1: How to use maps and other geographic representations, tools, and technologies to acquire, process, and report information from a spatial perspective.	✓	✓		✓		✓	
• Standard 3: How to analyze the spatial organization of people, places, and environments on Earth's surface.				✓		✓	
Places and Regions							
• Standard 4: The physical and human characteristics of places.	✓	✓	✓				
Human Systems							
• Standard 11: The patterns and networks of economic interdependence on Earth's surface.						✓	
• Standard 13: How the forces of cooperation and conflict among people influence the division and control of Earth's surface.						✓	
• Standard 14: How human actions modify the physical environment.				✓			
The Uses of Geography							
• Standard 18: How to apply geography to interpret the present and plan for the future.					✓	✓	
College, Career, and Civic Life Framework							
• Students identify knowledge and skills required of expedition team members and understand that expedition teams comprise of members with diverse knowledge and abilities.							✓

SCHEME OF WORK

Lesson 1: Northern exposures

Overview

An introduction to the polar regions and the Catlin Arctic Survey expeditions, this lesson focuses on the journey taken by the team members from their homes to the Arctic. Students will be able to compare the geographical similarities and differences between their local area and an extreme environment. Students will also use GIS, in the form of Google Earth, and multimedia content to develop their knowledge of the Arctic and Arctic Ocean.

Learning outcomes

- Know about the polar regions
- List differences and similarities between students' local area and the Arctic
- Describe the daily 'extreme' life on a research expedition
- Know about adventurous geographical careers

Resources



Slideshow 1:
Northern exposures



Student Sheet 1a:
A rude awakening

Student Sheet 1b:
Itinerary for UK team members

Student Sheet 1c:
Polar projection map template

Student Sheet 1d:
Diary template

Student Sheet 1e:
Team profile



Diagram:
Frozen Oceans Geography 11-14 Google Earth File



Video:
Rude awakening

Video:
CNN arrival

Video:
Ice Base tour



Gallery:
Life at the Ice Base

Gallery:
Arctic team

Lesson 2: The Arctic Ocean

Overview

The Arctic Ocean is one of the least understood regions on the planet. This lesson introduces students to the region and provides a background to the physical characteristics of this frozen ocean. Students will develop their geographical literacy skills through a piece of extended writing.

Learning outcomes

- Understand the importance of Arctic sea ice
- Use GIS to view and analyse places
- Describe the Arctic Ocean
- Write an extended description of the Arctic Ocean
- Understand the importance of Arctic sea ice

Resources



Slideshow 2:
The Arctic Ocean



Activity Overview 2:
Arctic sea ice Google Earth



Student Sheet 2a:
Arctic Ocean true or false

Student Sheet 2b:
What do you know about the Arctic?

Student Sheet 2c:
Arctic Ocean writing frame



Answer Sheet 2a:
Arctic Ocean true or false



Gallery:
Wonders of ice

SCHEME OF WORK

Lesson 3: Life beneath the ice

Overview

The Arctic Ocean is not a barren desert, but home to a variety of life. Students will learn about the interdependence of life in the Arctic through a food web activity, before investigating how scientists study life beneath the ice. Finally, students will consider the impact that issues such as ocean acidification will have on the life that inhabits the Arctic Ocean.

Learning outcomes

- Understand how changes in atmospheric carbon dioxide are affecting the Arctic Ocean
- Appreciate hardships of fieldwork in an extreme environment
- Develop understanding of life in a cold desert
- Understand how changes in atmospheric carbon dioxide are affecting the Arctic Ocean

Resources



Slideshow 3:
Life beneath the ice



Student Sheet 3a:
Day in the life card sort

Student Sheet 3b:
Arctic food web

Student Sheet 3c:
Arctic wildlife



Video:
Channel 4 News reports from the Arctic



Gallery:
Trawling for copepods

Lesson 4: Lessons from the deep

Overview

Students will learn about the importance of the Arctic Ocean in global ocean circulation and how this impacts climate. This lesson starts by revising the idea that difference in climate is based on latitude. This is followed by an investigation of how the sinking of cold salty water in the Arctic Ocean powers ocean circulation, bringing warm water from the Caribbean, as the Gulf Stream.

Learning outcomes

- Predict how latitude affects weather and climate
- Understand how the ocean affects weather and climate
- Explain the process of ocean circulation
- Communicate the importance of Arctic sea ice

Resources



Slideshow 4:
Lessons from the deep



Activity Overview 4:
Ocean circulation demonstration



Video:
Ocean circulation



Diagram:
Map of ocean currents

Diagram:
Thermohaline circulation

Lesson 5: A warming world?

Overview

The melting of the summer sea ice is providing new opportunities for accessing natural resources in the Arctic and using the Arctic Ocean as a maritime trade route. Students will be introduced to some of the political and commercial pressures facing the Arctic as well as finding out how they can stay engaged in the region using technology.

Learning outcomes

- Consider the future of an ice-free Arctic
- Discuss the geopolitics of the Arctic
- Argue how the Arctic should be governed
- Communicate geographical information using social media

Resources



Slideshow 5:
A warming world?



Student Sheet 5a:
Question ideas for Arctic Live

Student Sheet 5b:
Expedition tweet sheet

Student Sheet 5c:
My questions for Arctic Live



Diagram:
Political map of the Arctic

SCHEME OF WORK

Lesson 6: Heading home

Overview

After weeks in the cold, the team returns home. Towards the end of April and beginning of May, the sea ice starts to break up and life on the ice for the teams becomes increasingly difficult. This lesson introduces the main assessment piece and could be extended if students need more time.

Learning outcomes

- Consider the difficulties of Arctic logistics
- Develop presentation skills
- Synthesise knowledge about the Arctic
- Give peer feedback

Resources



Slideshow 6:
Heading home



Student Sheet 6a:
Presentation storyboard

Student Sheet 6b:
Presentation peer assessment

Lesson 7: The next chapter

Overview

The expeditions are only the first stage for the scientists involved. The analysis and publication of their research will take months if not years to complete after they return from the ice. Students end their Frozen Oceans journey by thinking about how they can support the Arctic Ocean and what it might take to be a member of the team.

Learning outcomes

- Empathise with returning explorers
- Explain the field research process
- Discover geographical careers
- Advocate for the Arctic
- Reflect on learning from the entire unit

Resources



Slideshow 7:
The next chapter



Student Sheet 7a:
Heading home

Student Sheet 7b:
Job application

Student Sheet 7c:
Be an Arctic ambassador



Gallery:
Arctic team