

The Poles
American Spaces Student Worksheet
By the Smithsonian Ocean Portal



Most of you know that the Earth's poles are cold. But did you know that there are hundreds of organisms especially adapted to living in these extreme temperatures? Did you know that the communities at the North and South poles are dramatically different from each other? Or that there is a difference between sea ice, ice shelves, and icebergs?

We often think of the poles together, but life and the physical characteristics of the Arctic Ocean and Southern Ocean are vastly different. The Arctic Ocean covers the North Pole and is mostly surrounded by land from northern Canada, Russia and Greenland. It's also relatively calm because it's largely covered by ice. Polar bears and walrus roam about. The Southern Ocean, with no surrounding land as protection, is more turbulent. It supports penguins and a large number of distinctive species because it has been isolated for 30 million years.

How do polar organisms adapt to these harsh climates? Icefish, for example, have antifreeze in their blood, while Arctic terns fly from pole to pole, logging some 20,000 miles per year, in order to avoid the harsh polar winters. Polar bears and walrus in the Arctic have thick layers of blubber that help them keep warm, but also provide them with stores of energy.

Objectives:

- Understand the differences and similarities between the Arctic and Antarctic
- Learn about the variety of animals found in the poles and how they adapt to cold
- Explain how climate change will impact the poles

Read through the Poles overview (<http://ocean.si.edu/arctic-and-antarctic>) aloud as a group or have students read individually. Students should write down answers and then go over the following questions as a group.

1. What forms the basis of the food web in the Arctic Ocean?

2. What isolates Antarctica from the other continents?

3. How do penguins in Antarctica handle the freezing temperatures?

4. How many species can be found in both the Arctic and Antarctic? What are some of these species?

5. What is sea ice? What are the different kinds of sea ice?

Vocabulary scavenger hunt:

1. Define “glacial ice”
2. Define “indigenous”
3. Define “hemoglobin”
4. Define “fast ice”

Additional Reading and Media

Video of receding ice cover in the Arctic over time: <http://ocean.si.edu/ocean-videos/receding-ice-cover>

Ice-loving Seals and the Loss of Sea Ice: <http://ocean.si.edu/blog/ice-loving-seals-and-loss-sea-ice>

Climate Change at the Poles: <http://ocean.si.edu/ocean-news/climate-change-poles>

The Sant Ocean Hall, Life at the Poles Exhibit: <http://ocean.si.edu/ocean-news/sant-ocean-hall-life-poles-exhibit>

Archaeologists Study Early Whaling Community in Quebec, Canada:
<http://ocean.si.edu/ocean-news/archaeologists-study-early-whaling-community-quebec-canada>

Cold-water Diving with WHOI: <http://ocean.si.edu/ocean-videos/cold-water-diving-who>