

The Arctic vs. Antarctic: Comparing the Poles

For use with the **INTRODUCTION** section of *Southern Exposure*

Overview: Students will investigate the geography, climate, seasons, and living conditions in the Arctic and Antarctic through online research and group discussion.

Learning Objectives:

The student will:

- Explain how habitat conditions in the Arctic and the Antarctic are different.
- Give one reason the Antarctic is colder than the Arctic.

Standards Addressed:

Alaska Science GLES :

- 5th: SA1.1, SA2.1
- 6th: SA1.1, SA2.1, SE2.2
- 7th: SA1.1, SA2.1, SE2.2
- 8th: SA1.1, SA2.1, SE2.2

National Science Education Standards:

- Content Standard A: Science and Inquiry
- Abilities necessary to do scientific inquiry (5-8)

Materials Needed:

- Ted Ed video: **The Arctic Vs. The Antarctic** - <http://www.youtube.com/watch?v=Z5VRoGTF60s>
- Pencils, pens, and highlighters
- Science Journals/Notebooks
- Poster paper (one piece per 4 students)
- Computer Lab or laptop access
- Online access to the Woods Hole Oceanographic Institution's "Compare the Poles" study resources <http://polardiscovery.whoi.edu/poles/> (sets of resources can be printed if online access is not available)

Teaching Time: 1 hour

Preparation Time: 30 minutes

- Print and review all study resources.
- Prepare poster paper (You'll need one large poster-sized piece for each group of 4 students)



Background:

It's easy to think of things that the Arctic and the Antarctic have in common: they're both cold, both icy, and both are characterized by 24 hours of daylight in summers and constant darkness in winter. Yet, in comparing the Earth's Polar Regions this is really just the tip of the iceberg. What many people don't realize is that the Arctic and the Antarctic are nearly as different as they are similar. Not only do they boast completely opposite geography (the Arctic is an ocean surrounded by land, and the Antarctic is a continent surrounded by ocean), they're home to vastly different wildlife (the largest land animal in the Antarctic is a midge measuring 1mm in length), and though they are both relatively cold they have distinctly different climates. While the Arctic has been inhabited by people for thousands of years, the first documented exploration within the Antarctic Circle (beyond 65° South latitude) was by Captain James Cook around 1775.

In this activity your class will compare and document the climate, geography, ice, and wildlife of the Arctic and the Antarctic. Research conducted as part of this activity will act as helpful background knowledge to students throughout *Southern Exposure*.

Directions:

1. After completing the INTRODUCTION section of *Southern Exposure* ask your class what they know about the Earth's Polar Regions.
2. Following a short, unstructured class discussion, have students spend 5-8 minutes journaling in their science notebooks about what they already know about **the Arctic and the Antarctic**. Prompt them to brainstorm a list of things they know about each region, highlighting any differences they might be familiar with.
3. As a class, watch the Ted Ed video, "**The Arctic vs. the Antarctic**": <http://www.youtube.com/watch?v=Z5VRoGTF60s>. Explain that this video is an introductory comparison to features of and conditions in the Arctic and the Antarctic. In the upcoming project students will be working to learn even more about the Polar Regions.
4. Direct students to the Woods Hole Oceanographic Institution website, instructing them to navigate through the resources and take notes on their findings in their science notebooks.
5. Explain that later students will be transferring these facts into a Venn diagram.
6. Allow students 20-30 minutes to read through various sections of the website.
7. When students have finished researching, break them into groups of 4 to discuss and compare their findings (5-10 minutes).
8. Pass out a piece of poster paper and pens to each group.
9. On the poster paper have students create a Venn diagram (two large overlapping circles). One circle should be labeled ARCTIC, the other ANTARCTIC.
10. Have students populate their Venn diagrams using their notes and any additional ideas they came up with in their discussions. Students may also choose to illustrate concepts.
11. Wrap-up the lesson with a class discussion (see discussion questions below).

Discussion Questions:

- *Were there things that you already knew about the Arctic/Antarctic that were supported by what you found in your study resources?*
- *What were three things the Arctic and the Antarctic had in common?*
- *What were three ways in which the two regions differed?*
- *What was one thing you learned that surprised you?*
- *Why do you think there are more land animals in the Arctic than the Antarctic?*
- *In the Antarctic what makes living conditions in the marine environment more hospitable than living conditions on land?*
- *How are sea ice conditions in the Arctic and the Antarctic similar/different?*
- *How are climate conditions in the two regions similar/different?*
- *Has environmental change been recorded in the Arctic/Antarctic? If so, what sorts of changes have been recorded?*

Extensions:

- 1.) Have students study the Exploration Timelines (in the *Arctic* and *Antarctica* sections of the Woods Hole website) for one or both of the Polar Regions. Using what they've learned in their study of the Polar Regions, have students write a first-person narrative from the point of view of an early explorer on such an expedition.