

Topography and Resources

Integration: Earth Science; Social Studies

Grade Levels: 4-6

Time: 1-2 class periods

Materials:

- Map of Antarctica
- Research materials such as the internet, almanacs, encyclopedias, etc.
- *Topography and Resources Comparison* worksheet.
- Modeling clay (optional)

Objectives:

Students will:

1. Understand the topography of Antarctica and its natural resources.
2. Investigate the topography and natural resources of the country where they live.
3. Compare the topography and natural resources of where they live to Antarctica.
4. Understand the affect topography has on the Bancroft Arnesen Expedition.

Lesson:

1. Tell the students that they will be discussing the *topography* of Antarctica
 - a. Topography is the physical structure of the surface of the land.
2. Ask students what they think Antarctica is like (e.g. flat, hills, mountains, etc.)
3. Tell the students that Antarctica is almost completely covered by a layer of ice about 1.5 miles thick. Only 2% of the land is dry rock. Inform the students that they will investigate Antarctica's ice in greater depth in another lesson.
 - a. One of the areas of dry rock is known as the Dry Valleys, which are located near McMurdo Station and the Ross Ice Shelf
 - b. The Dry Valleys are the driest places on earth. There has not been rain in over 2 million years.
4. Inform the students that the continent ranges from sea level (where it meets the Indian Ocean) to 16,852 feet (5,140m) at its highest point (Visson Massif). The average elevation is 7590 feet (2300 m). This, along with the 1_ -mile thick layer of ice, makes Antarctica the highest continent.

5. Tell the students that there are three distinct areas of Antarctica—West Antarctica, East Antarctica, and the Antarctic Peninsula. Ask students to find these on the map of Antarctica.
 - a. The rocks of East Antarctica are at least 3000 million years old. The rocks of West Antarctica are younger—300 million years old.
6. Ask the students if they can identify the land feature that separates East and West Antarctica (Transantarctic Mountains).
 - a. The Transantarctic Mountains are 1800 miles (3000 km) long mountain range that runs almost the entire length of Antarctica. They rise to about 16,500 feet (5,000 m) high.
7. Tell the students that Antarctica also has volcanoes. Mt. Erebus is the largest of the active volcanoes. Have students point it out on the map.
8. Inform students that Antarctica does not have forests, farmland, or visible rivers or lakes.
9. Divide students in small groups and have them investigate and compare the topography of Antarctica with the topography of the country they live in. Have students utilize the internet, almanacs, encyclopedias, etc and record their results on the *Topography and Resources Comparison* worksheet.
 - a. Elevation
 - b. Existence of mountains
 - c. Bodies of water
 - d. Volcanoes
 - e. Forests, grasslands, farmland, etc.
10. Remind students of the Bancroft Arnesen Expedition across Antarctica. Ask what effect the terrain has on an Expedition.
 - a. The explorers must ski upward to an average elevation of 11,000 feet.
 - b. At higher elevations, it becomes harder to breath because there is less oxygen.

Natural Resources

11. Ask for definitions of the word “resource.” (a resource is a source of support or a natural source of wealth).
 - a. The earth has many natural resources in the form of minerals, metals, rocks, water, oil, etc.
 - b. Natural resources vary from place to place.
12. Antarctica has small amounts of iron, chromium, copper, gold, and other minerals, and coal. None of Antarctica’s natural resources are being used.
13. Have students investigate the natural resources of the country they live in. Students should record their responses on a Comparison Sheet.

ALTERNATIVE: The research can be done at home and students can report on it in class.

EXTENSION: Have students create models that depict the topography of Antarctica and/or the area in which they live. This can be done with modeling clay, paper, and other craft materials.

Assessment:

Teachers will assess:

1. Student's understanding of the topography of Antarctica.
2. Student's comparison of Antarctica's topography to the area where they live.
3. Student's research skills.