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**Antarctica: The Land of Ice**

**Antarctica**

Antarctica is located at the southernmost point on Earth. It is surrounded by the Southern Ocean. At 5.5 million square miles Antarctica is the 5th largest continent on Earth. Almost completely covered by ice, it has no indigenous inhabitants and very limited plant and animal life. Though there is no sand, Antarctica’s arid climate means it is a desert. The continent receives very little precipitation and what little it does receive always falls as snow. Antarctica is a continent that is still vastly unknown, however we do know that:

* Antarctica is almost twice as large as the United States
* Anywhere from 60-80% of the Earths fresh water is frozen in Antarctica
* The thickest ice on Earth is located in Antarctica and it is 3.1 miles thick
* The lowest recorded temperature on Earth is -126 degrees, and it was in Antarctica
* Winds have been recorded at 203mph across the continent

**Scientific Research**

 The only humans to live here are researchers and scientists, and even they live here only temporarily. As interest grew in Antarctica, countries such as Argentina, Australia, Great Britain, Chile, France, New Zealand, and Norway began to lay claim to sections of the continent. In 1959, 12 countries negotiated the Antarctic Treaty to preserve Antarctica for peaceful scientific research and to put all territorial claims on hold. Since then, other countries have established research programs in Antarctic and 26 new countries have signed on. Today, there are around 69 research facilities and stations operated by 30 countries that serve as bases for scientists to study physical geography, climate and wildlife. The population of these stations ranges from 4,000 people in the summer to 1,000 people in the winter. Although the United States makes no territorial claims to Antarctica, it does maintain numerous research stations like McMurdo Station. This research station is the largest on the continent. Stations like McMurdo have discovered and learned from various plants, animals and extreme climates such as:

* The only two vegetation’s found on the continent are Antarctic pearlwort and Antarctic hair grass and both can be found on the Antarctic Peninsula
* The Southern lights, or Aurora Australis is the mixing of numerous gases and electrons in the atmosphere
* Emperor Penguins can survive the harshest of winters to incubate their eggs, proving to be one of the toughest species on Earth
* The Antarctic toothfish has a special antifreeze protein that helps it survive frigid waters.
* Elephant Seals need a higher fat diet to survive the winters
* Several whale species survive the Southern Ocean for many months of the year by shutting down or limiting different organs within their bodies, and directing energy and body heat to hearts, brains and lungs.

**New Frontiers**

Because Antarctica’s environment remains largely untouched by humans, it is a valuable location fro scientific research. Compared to other places on Earth, for example, Antarctica’s atmosphere, soil, and water contain little to no trace of pollution. As a result, scientists are able to use samples from Antarctica as a base for analyzing other parts of the world. Lake Vostok, a subglacial lake (a lake underneath a frozen glacier) was discovered in the early 1970’s. In 2012 scientists began probing the lake for study using deep drilling techniques. To reach the lake at the bottom of the frozen glacier, researchers had to drill more than 2 miles through frozen ice. From this study scientists have found bacteria not known to exist anywhere else on Earth. Some scientists have raised concerns that antifreeze used in Lake Vostok drilling could harm life forms discovered. Scientists must take great care to preserve Antarctica’s pristine environment.

Thinking Geographically

***1. Analyzing Information-*** What characteristics of Antarctica’s land and climate make sustaining life difficult?

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***2. Identifying***- What are some common characteristics shared by animal life and plant life found in and around Antarctica? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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***3. Drawing Conclusions***- What potential problems could result from nation’s making territorial claims in Antarctica?

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***4. Exploring Issues***­- Even though natural resource deposits have been found in Antarctica, many countries have agreed not to mine them. What do you think are the pros and cons of mining in Antarctica? List a minimum of **4** for each side.

|  |  |
| --- | --- |
| Pros | Cons |

5. Expository- Explain how research in Antarctica can/could impact your life today. You may need to research about the current scientists and work being done in Antarctica. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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***6. Critical Thinking-*** Look at the timeline of travels and discovery of Antarctica below. Label each exploration according to the chart below.



South Pole

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **1772-1774****James Cook**First to cross Antarctic Circle | **1838****Charles Wilkes**Explored Eastern Coast | **1840’s****James Ross**Charted Antarctic Glacial Bays | **1901****Robert F. Scott**First Inland Exploration | **Roald Amundsen****1911**First to Reach South Pole |

***6. Critical Thinking***- What correlation can be seen in Antarctic explorations and modernization of society?

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***7. Mapping***- Label the map above of Antarctica using the following website <http://www.nationsonline.org/oneworld/map/antarctica_map.htm> or google “Physical Map of Antarctica Nations Online Project” and click the first option. Use triangles for Mountains and trenches.

|  |  |  |
| --- | --- | --- |
| South Pole | Transantarctic Mountains | East Antarctic Ice Sheet |
| Queen Maud Land | Southern Ocean | Ross Ice Shelf |
| Amery Ice Shelf | Lake Vostok | Amundsen Sea |
| Weddell Sea | Antarctic Peninsula | Vinson Massif Trench |
| Antarctic Circle |  |  |