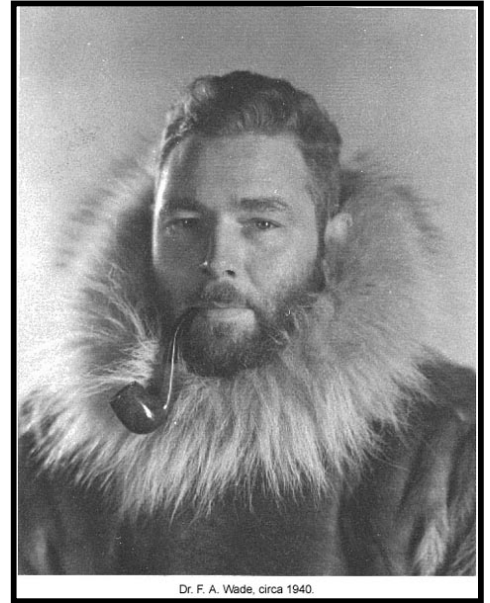


# Explore Antarctica!

Thematic Unit for Elementary Students  
(Designed for grades 3<sup>rd</sup> and 4<sup>th</sup>)

We are off to explore Antarctica! What do we need to know before our trip? What will we see? What will we discover? The three lessons in this unit will explore the geography, climate and an explorer's experience traveling to the South Pole.

The unit accompanies the exhibit *Antarctica – Pioneering American Explorations of the Frozen Continent* at the Museum of Texas Tech University open January 30<sup>th</sup> to December 20<sup>th</sup>. The exhibition highlights expeditions into the unknown of Antarctica and Texas Tech University's own Dr. F. Alton Wade. Dr. Wade, who was on the second and third Byrd Expeditions in the 1930's, initiated Texas Tech's expeditions to Antarctica in the 1960's while head of the Geology Department. He made a total of five expeditions to Antarctica while at the University.



## Polar Opposites - Geography

### Objectives

*The students will be able to:*

- Understand the geography and climate of Antarctica
- Compare and contrast the continent to the Arctic and to where they live

### TEKS

- 113.5 4a, 16a, 16b

### Materials

- Computer with projector to show videos
- Handouts: "Polar Opposites" and Time Kids "Exploring Antarctica" from <http://www.timeforkids.com/news/antarctica-printables/136211>

### Preparation

- Print out copies of handouts for each student.

## Lesson

- Ask students, “Where do you think is the coldest place on earth?” Students may give many answers but common ones are likely the North Pole and the South Pole. Which is colder? How can you tell the two poles apart? Show students the TED-Ed video, “The Arctic vs. the Antarctic.” <http://ed.ted.com/lessons/the-arctic-vs-the-antarctic-camille-seaman#digdeeper>).
- Have the class discuss the similarities and differences between the two poles.
- Next, ask students to think about how Antarctica compares to where they live. How big is it compared to their state? What is the landscape like? What wildlife lives there?
- Give each student a copy of the “Polar Opposites” activity sheet. Divide the class into groups of three or four. Have students work together using print and online resources to find out information about the Arctic, Antarctic and where they live. After students find the information, have them fill in the chart comparing the three locations.
- Ask students to share what characteristics of Antarctica make it the most different from the Arctic and where they live, as well as those that are most similar.
- Give each student an “Exploring Antarctica” handout. Have students read the timeline to learn about the history of Antarctic exploration and answer the questions. Ask students to think what it would be like to go on an expedition. What would they need to know beforehand? For example: What is the climate like? What wildlife lives there? What will I eat? What will I wear? How will I travel? List their ideas on the board.



# Brr! It's cold in Antarctica! Science

## Objectives

*The students will be able to:*

- Hypothesize and conduct experiments to determine how animals and people keep warm in cold climates

## TEKS

- 112.15 2a, 2b, 4a

## Materials

- Medium/large bowl
- Ice
- Water
- Vegetable Oil
- Plastic sandwich bag
- Plastic cups/containers
- Thermometers
- Cotton towels
- Fleece fabric
- Bubble wrap
- Tape

## Lesson

### *Activity I*

- How do animals keep warm in the cold environment? Explain that marine mammals such as seals have a layer of blubber to help keep them warm. (Cold blooded animals such as fish do not need to stay warm.) Blubber has a low thermal conductivity, which means it does not transfer heat as well as other tissues such as skin. Therefore, it helps insulate the animal's body.
- Demonstrate how blubber keeps animals warm using ice water and vegetable oil. Fill a bowl with ice water and fill a plastic bag with the vegetable oil. Have students one at a time place one hand directly into the water and one hand into the bag with oil then into the ice water. Students should notice that the hand in the bag with oil is much warmer than the hand placed directly into the water.

### *Activity II*

- How do humans keep warm? Divide students into groups for a science experiment to determine what material will keep humans the most warm in cold temperatures: fleece, cotton or bubble wrap.
- Give each group three containers filled with water heated to body temperature. Have students test the temperature of the water with a thermometer and write it down. Next, instruct students to wrap each of the containers with one of the materials and let them sit in a cold area (outside, in a refrigerator or a cooler with ice).
- After some time has passed, students will use the thermometer to test the temperature of the water in the three containers. Have students calculate how much the temperature changed to determine which material kept the water the warmest.
- Optional: Use the video, "Keeping Warm Experiment" by Digital Explorer to show the experiment. <http://vimeo.com/62203004>

# We Are Explorers - Writing



## Objectives

The students will be able to:

- Research and write a story about their own expedition to Antarctica based on geographical, scientific and historical knowledge of Antarctica
- Plan, draft, revise and edit their writing to compose a final text
- Create an accordion-style book incorporating their written composition

## TEKS

- 110.14 20a, 17a-d

## Materials

- Notebook paper
- Pencils and erasers
- Colored mat board cut in 5" squares
- White 18"x24" paper cut into 4 ½"x24" strips
- 24" yarn or ribbon
- Markers
- Colored pencils
- Glue sticks

## Preparation

- Place paper strips, colored square boards, markers, color pencils, yarn and glue sticks on tables for students to use during the book making activity.

## Lesson

- Have students share what they learned about Admiral Byrd and Dr. Alton Wade from the exhibit at the Museum of Texas Tech University. Why did they travel to Antarctica? What modes of transportation did they use? What did they discover there?
- Encourage students to imagine what it would be like if they took an expedition to Antarctica. What would they discover?
- Students will write a short story about their imaginary adventure to the South Pole. Provide students with the following introduction: *You are an explorer. Your mission is to observe and document the world around you. Take notes and collect things you find on your travels. Notice patterns. Focus on one thing at a time. Record what interests you.*
- Students must answer the following questions:
  1. What will you take on your trip? Name at least five items.
  2. How will you travel? Describe your journey to get there.
  3. Where will you live? You must protect yourself from the cold.
  4. What will you eat? Consider what resources you will have.
  5. What will you see? Name at least three things.
  6. What new things will you discover?

- Students will write a first draft on notebook paper, review it and make any edits (grammatical, structural and spelling).
- Students will create an accordion book to write and illustrate their written composition. Show students an example of the book. Demonstrate the steps to book making and have students complete the steps with you.
- Steps:
  1. Take a strip of white paper and fold it in half.
  2. Fold in half two more times and open. There should be eight sections.
  3. Refold the strip along the fold lines in an accordion fold.
  4. Using a marker, make an 'X' on the first and last square section.
  5. Add writing and illustrations to the book.  
*Encourage students to think about how they want to dictate their sequences. Show students how they can use the book horizontally or vertically. They may write sentences in individual squares or write the length of the strip. Students can choose what materials they would like to use to write and draw. Encourage them to be creative!*
  6. Choose two colored squares for the cover and back of the book. Put glue on one 'X' marked end of the paper strip. Center a colored square board on top and press down.
  7. Put glue on the second 'X'. Center the yarn across the 'X', place the other colored square board on top and press down.
  8. Create a title for the book and write it on front.
  9. Fold the book together, wrap the yarn ends around and tie in a bow. The string will hold the book shut.
  10. Optional: Use old maps as paper for the cover and back of the book instead of colored paper.

### Adaptations

- Use other Time Kids Antarctica Printables to learn about Antarctica using maps, charts, timelines and diagrams that are adapted for K-6 students. Website: <http://www.timeforkids.com/news/antarctica-printables/136211>
- Design a postcard from your expedition in Antarctica. Write a letter home to someone sharing your experiences.

### Other resources

- NASA Education – Antarctica, <http://www.nasa.gov/audience/forstudents/k-4/stories/what-is-antarctica-k4.html#.VMsj7b8SyxE>

Lesson created by Kelly Chandrapal

Name \_\_\_\_\_

Date \_\_\_\_\_

# Polar Opposites

Compare Antarctica to the Arctic and to where you live now.  
How are they alike? How are they different?

	Arctic	Antarctica	Where I Live
Location			
Land Size			
Typical terrain			
Climate			
Average Temperature			
Population			
Common Animals			
Natural Resources			
Fun Fact!			

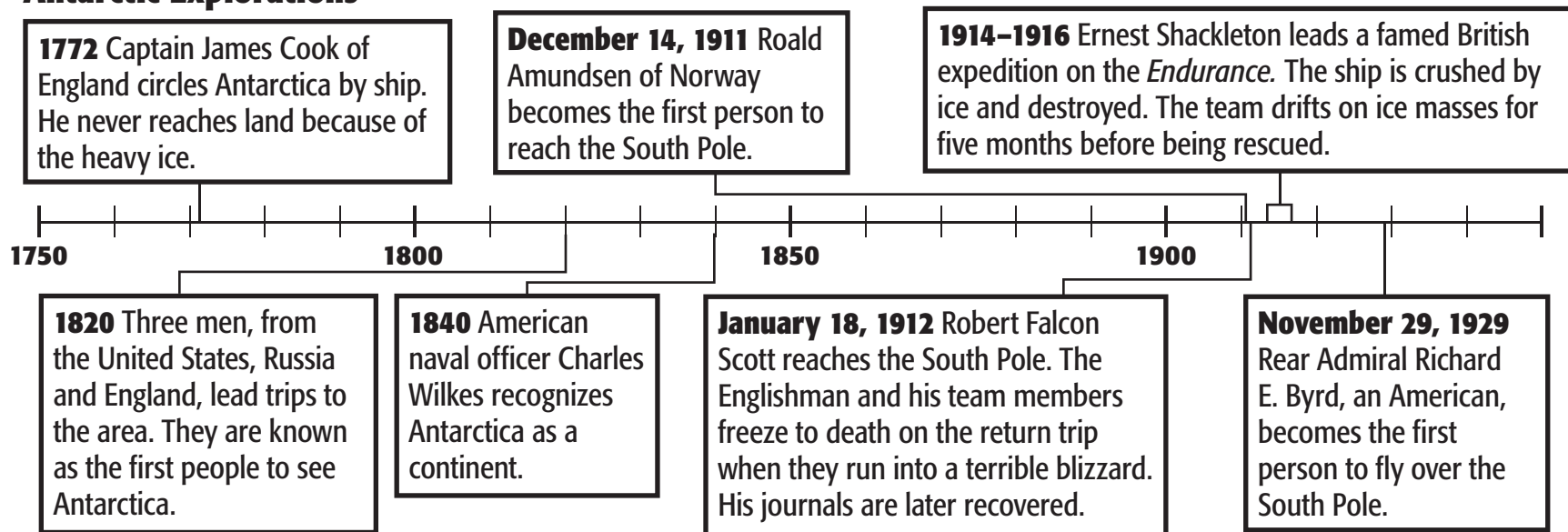
Name ..... Date .....

# Exploring Antarctica

Antarctica was the last of the seven continents discovered. Early explorers wanted to prove that it was there. Some hoped to find new places to hunt for seals and whales. Other explorers wanted the honor of being the first to reach the continent and different places on it.

The time line below lists some famous Antarctic explorations. Use it to answer the questions.

## Antarctic Explorations



1. Captain James Cook and his crew spent two years trying to reach Antarctica. Why didn't the team reach land?

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2. What happened on December 14, 1911?

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3. Robert Falcon Scott reached the South Pole about how long after Roald Amundsen?

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4. Why do you think researchers continue to explore Antarctica and its unique environment?

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