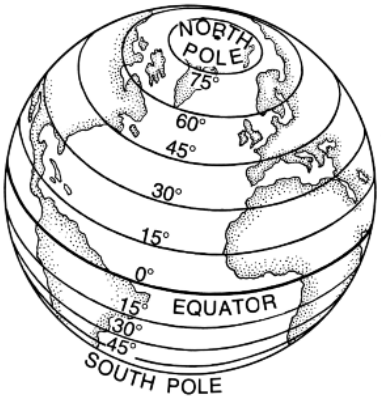
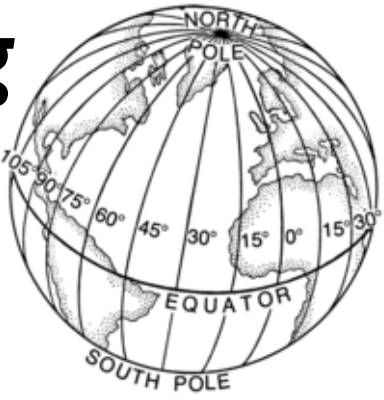


The Amazing R A C E



Introduction: It may seem a bit far fetched for you to think of navigating your way to Antarctica. However, on the high seas it often gets incredibly foggy and at the tip of South America the waters of the Atlantic, Indian and Pacific ocean are deflected by currents traveling unimpeded by landmasses around the Antarctic continent. In this 'zone of convergence' the dynamics of the water vary according to season, weather conditions and ice production. The passage way is known as Drake Passage and is approximately 600 miles wide, situated about 100 miles north of the Antarctic Peninsula. This acts as a natural boundary separating two hydrological regions of distinctive climates: the tip of South America (Tierra del Fuego) and the frigid polar regions of Antarctica. These zones result in energy sweeping over the surface of the ocean with the cold Antarctic waters sinking beneath the relatively warmer waters of the sub-Antarctic. The winds predominantly come from the west and are most intense around Cape Horn, creating enormous waves in epic proportions! In order for ancient and modern day mariners to be able to cope with these conditions, they needed to be efficient at navigating throughout the vast ocean.

Please review the basics of navigation (page 2) to prepare for the "RACE to ANTARCTICA".
Then, gather a group of your classmates to form a team of four. The first team to give the instructor the total distance traveled, with correct bearings wins the race! All participants MUST finish, regardless of their place in the race!

Essential Question:

- Identify and analyze properties of national and world maps to ask and answer geographic questions

Time: 50 minutes

Level: 5 - 8

Materials:

- U.S. Table Top Map
  http://education.nationalgeographic.com/media/file/unitedstates-tabletopmap-part1.pdf
- World table-top map
  - http://education.nationalgeographic.com/education/multimedia/world-physical mapmaker-kit/?ar_a=1
- Tape
- Ruler
- Dry Erase markers

Standards:

National Geography Standards:

- Standard 1: The World in Spatial Terms: students engage in using maps and other geographic representations, tools and technology.

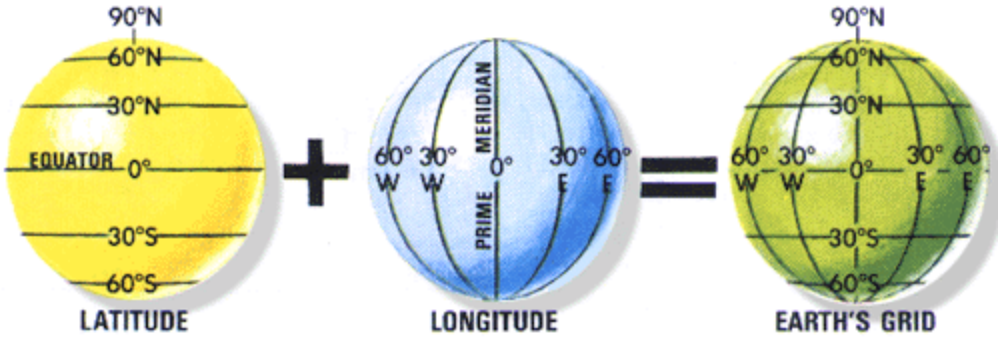
National Science Education Standards:

- History and Nature of Science: historical perspectives, many individuals have contributed to the traditions of science.

Beth E. Simmons / OceanIngenuity
Palmer LTER, 2014

The Amazing R A C E

GEOGRAPHY**REVIEW**



Review the Basics of Navigation: To find a place exactly, you need lines that cross to create an intersection. Grids assist us in identifying the location of objects or features on a map. One type of grid is known as the latitude and longitude grid. Refresh your memory of the Earth's Grid of latitude/longitude using the illustrations above. REMEMBER: Latitude and longitude coordinates are represented as decimal numbers. The latitude is preceded by a minus sign (–) if it is south of the equator (a positive number implies north), and the longitude is preceded by a minus sign if it is west of the prime meridian (a positive number implies east); for example, 37.68455° –97.34110°.

Instructions: Print out and build your table top size map of the United States. (16 - 8 1/2 x 11 sheets)
http://education.nationalgeographic.com/media/file/unitedstates-tabletopmap-part1.pdf
The bearings listed below will ask you and a partner to locate specific U.S. cities. Please note that you must travel where the longitude and latitude lines intersect! Record your final destinations in the table and check your answers with the instructor before you proceed.

Destination **Which U.S. Cities have these bearings?**	**Bearings**	
	Latitude	**Longitude**
1	+41.65	-70.17
2	+34.05	-118.24
3	+25.64	-80.21
4	+43.03	-87.9
5	+29.42	-98.49
6	+37.54	-77.43

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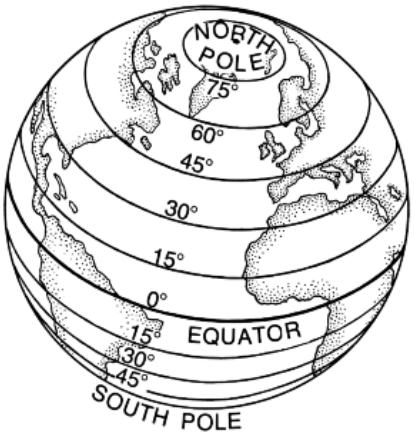
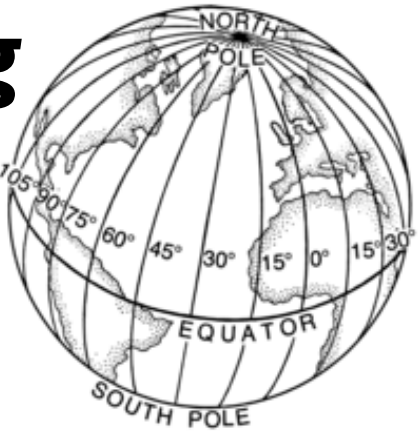


The Amazing R A C E



Race Instructions: Print out and build your table top size World map. (16 - 8 1/2 x 11 sheets). **http://education.nationalgeographic.com/education/multimedia/world-physical mapmaker-kit/?ar_a=1.** You have been tasked with finding your way to Palmer Station, Antarctica. In this case you have been given the major locations and must find and record your bearings. Use your dry erase markers to document the distance traveled from start to finish, recording your total (statute) miles traveled using the distance key on the map (3 inches = 1/2 mile or 2,500 feet).

Destination	Bearings	
	Latitude	Longitude
Place Your School Here!		
Miami, Florida		
Santiago, Chile		
Punta Arenas, Chile		
Drake Passage		
Palmer Station, Antarctica		
TOTAL DISTANCE TRAVELED:		

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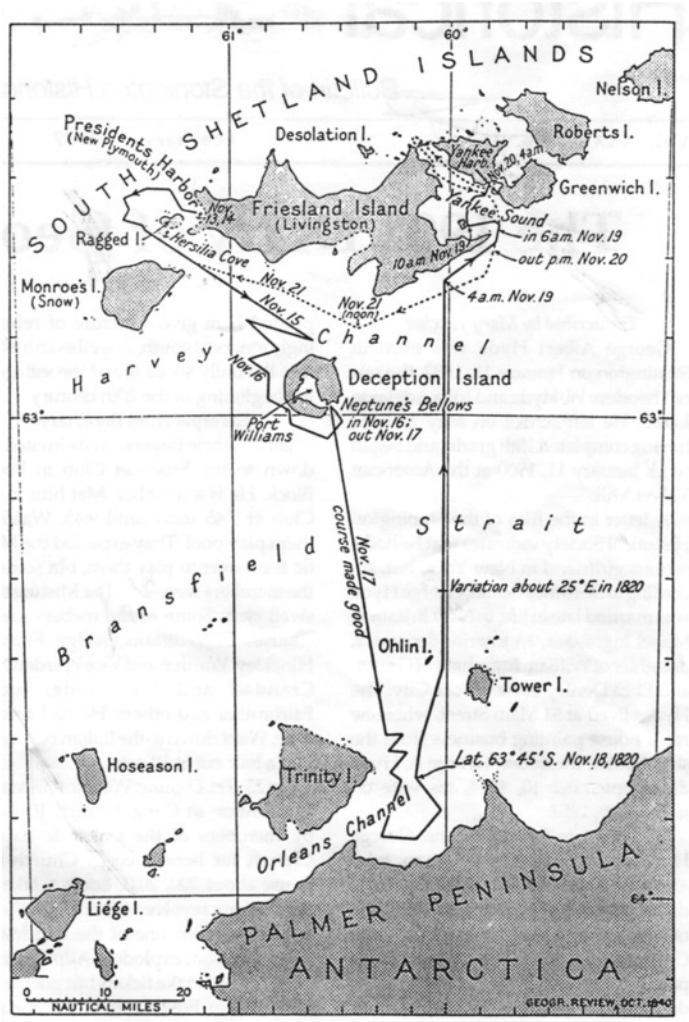
Historical Connections:

Nathaniel B. Palmer

At age twenty, a young, American fur seal hunter named Nathaniel B. Palmer and his 13 year old brother Alexander, left Stonington, Connecticut to command a forty-seven foot, one mast sloop called Hero. The ship crossed the wild stretch of ocean known as the Drake Passage, explored the South Shetland islands extensively and cruised further south in search of additional fur seal rookeries. On November 17th, 1820, Nathaniel Palmer sighted "land not yet laid down on his chart." Log books have reported Palmer reaching as far as 68°S. He described the area as having,"a great glaciated peninsular mountain range (an extension of the Andes Mountains), very sterile and dismal, more heavily loaded with ice and snow than the Shetland islands. No fur seals spotted and the coast bound in ice even in the mid-summer season."This place would later become known as Palmer Land on the continent of Antarctica. President Franklin D Roosevelt took an active role in supporting two U.S. Antarctic Service Expeditions in the Antarctic Peninsula area between 1939 - 1941 near Stonington Island.



Palmer's Antarctic discovery cruise in November 1820.

Resources:

1. The Stonington Historical Society/Captain Nathaniel Palmer http://www.stoningtonhistory.org/index.php?id=3

2. History of Palmer Station: http://antarcticsun.usap.gov/features/contentHandler.cfm?id=2130

3. Palmer Station webcam: http://www.usap.gov/videoclipsandmaps/palwebcam.cfm

4. Palmer LTER: http://pal.lternet.edu/

5. Old Palmer Station tidbits:http://www.palmerstation.com/history/op.html

6. 100 Years of Humans in Antarctica by Lily Whiteman National Science Foundation February 3rd, 2012. http://www.livescience.com/18302-humans-antarctica-science-nsf-bts.html

7. Amazing Race to the Bottom of the World a New York Times Article: http://www.nytimes.com/2011/12/13/science/amazing-race-to-the-bottom-of-the-world.html?pagewanted=all&_r=0

8. Amundsen's South Pole Expedition: an archival glimpse into the preparations for Roald Amundsen's successful south pole expedition http://ngm.nationalgeographic.com/2011/09/amundsen/antarctica-video

9. The Race to the South Pole by Sian Flynn: http://www.bbc.co.uk/history/british/britain_wwone/race_pole_01.shtml

Teacher Reference: Answer Sheet

Notes:

- Latitude and longitude coordinates are represented as decimal numbers. The latitude is preceded by a minus sign (–) if it is south of the equator (a positive number implies north), and the longitude is preceded by a minus sign if it is west of the prime meridian (a positive number implies east); for example, 37.68455° –97.34110°.
- Have students build the maps the day before this activity to finish this activity in one class period.
- Laminating the maps allows students to use the dry erase markers to write on the maps and encourages the maps to be used year after year.

Geography Review: **U.S. Table-top map**

Destination/Country	Bearings	
	Latitude	Longitude
Scargo Lake, Massachusetts	+41.65	-70.17
Los Angeles, California	+34.05	-118.24
Biscayne Bay, Miami, Florida	+25.64	-80.21
Milwaukee, Wisconsin	+43.03	-87.9
San Antonio, Texas	+29.42	-98.49
Richmond, Virginia	+37.54	-77.43

Geography Lesson: **World Table-top map**

Destination	Bearings	
	Latitude	Longitude
Your School Here!		
Miami International Airport, Florida	25.79	-80.27
Aeropuerto De Santiago, Chile	-33.39	-70.79
Punta Arenas, Chile	-53.15	-70.55
Drake Passage	-58.58	-62.9
Palmer Station, Antarctica	-64.77	-64.05
TOTAL DISTANCE TRAVELED:		