EXPLORATION

OVERVIEW

Students will analyze the roles and contributions to the history of exploration of two Antarctic explorers: England's Robert Falcon Scott and Norway's Roald Amundsen. Students will observe tools and other objects the teams used, collect information on the role of team members, and learn about the backgrounds of Scott and Amundsen. They will use what they learn to make inferences about each explorer's motivation and planning strategies for being first to the South Pole, and for understanding the outcome of the race.

NYS Social Studies Core Curriculum

Standard 2.3: Study of the major social, political, cultural, and religious developments in world history involves learning about the important roles and contributions of individuals and groups.

BACKGROUND FOR EDUCATOR

By the end of the 1800's Antarctica was the last remaining unknown in continental exploration. For some explorers being the first to the South Pole was the ultimate triumph. While the Pole was goal of many expeditions, others also included scientific teams that studied meteorological conditions, ocean currents, magnetism, geology, and biology. In 1909, two very different men, England's Robert Falcon Scott and Norway's Roald Amundsen, vied to be first to the South Pole. Each man utilized different strategies to travel overland, and to deal with the challenges of the extreme cold, malnutrition, frostbite, and howling winds.

BEFORE YOUR VISIT

Class Discussion: What is Exploration?

Use the following questions to stimulate a class discussion about exploration:

- Why do people explore? *(Answers may include: to discover new places, to learn more about places we know about, to be the first to make a discovery.)*
- Where have humans explored and where are we exploring today? *(Answers may include: In the past people set out to find new lands and explore them [Columbus, Lewis and Clarke], expeditions to discover animals/fossils [Gobi Desert dinosaurs]. Today, people explore the ocean depths [Sulfide chimneys], the Moon, Mars, etc.)*
- What does it take to be an explorer? *(Answers may include: curiosity, a desire know or find out, courage, leadership, ability to plan strategically, etc.)*

Plan how your students will explore *Race to the End of the Earth*. In the exhibition, students will analyze the contributions of Scott and Amundsen in the history of geographic exploration. Using the **student worksheets**, students will interpret and analyze documents and artifacts to make inferences about the explorers' motivation for reaching the South Pole. Students will work independently to compare and analyze several aspect of the teams' journey: team members, transportation, clothing, food, housing, and planning.

Distribute copies of the student worksheets before coming to the Museum. Review the worksheet with students. Make sure they understand what they are to do.

Activity: Explorations in the Early 1900s

Call on students to share what they know about life in the early 1900s. Ask students to think about culture, politics, explorations, technology, and social developments during that time. Tell students they will work together to create a timeline showing developments in these areas from the 1900 to 1910, the year Scott and Admundsen left for Antarctica. Divide the class into four groups. Assign one topic to each group to research: culture, technology, politics, or social developments. Ask groups to find at least one entry per year. *(Examples: Culture—silent movies; Technology—First Model T Ford; Politics—British Empire includes Australia, Canada, India, Pakistan and many other countries; Social Developments—advocates fight for children's labor laws and welfare.)* When groups are ready have them create one timeline showing all the developments. Discuss with students how this might give them a different perspective on the journeys that Admundsen and Scott made.

Explain to students that at the turn of the last century, Antarctica was the last continent to be explored. Have them share what they know about its geography, seasons, climate, and wildlife. Ask:

- What do you think explorers hoped to find in Antarctica? *(Answers may include: wanted to be the first to discover the South Pole, wanted to learn about the geography of the continent, wanted to learn about the organisms there, study weather.)*

Point out that early expeditions to Antarctica often took several years. Ask:

- What planning would you need to do for an expedition of that length of time and under those harsh conditions? *(Answers may include: need to plan for clothing, shelter, food, navigation equipment, fuel, and transportation. Explorers would also have to carefully map out a plan for going to and returning from the Pole.)*

Tell students that in the exhibition, *Race to the End of the Earth*, they will follow the in the footsteps of two explorers, Robert Falcon Scott and Roald Amundsen, who vied to be the first to reach the South Pole.

DURING YOUR VISIT

Race to the End of the Earth Exhibition

4th floor (30–45 minutes)

As students explore the exhibition have them compare Scott and Amundsen's teams. Each student should focus on these aspects: transportation, clothing, food, fuel and planning. Have students note details on their **student worksheets**.

Just beyond the theater, students can "Meet the Men." As students go through the exhibition, encourage them to pay close attention to the decisions the British and Norwegian teams made about clothing, transportation, and timing, and to the consequences of those choices.

Cullman Hall of the Universe

Lower Level (15–20 minutes)

In the Cullman Hall of the Universe students can examine a full-scale replica of a NASA Mars Exploration Rover, a robotic geologist with a mission to discover the history of water on Mars. Have students identify the technological tools aboard the Rover and how they collect information about the Martian landscape.

BACK IN THE CLASSROOM

Class Discussion: Scott vs. Amundsen

Have students work in small groups to share and discuss what they learned. Then have groups present their findings to the rest of the class. Ask:

- What motivated Scott and Amundsen, and how did their differences in planning affect the outcome? How would you characterize each leader? *(Answers will vary. Students should support their responses to this question.)*

- How would you characterize each leader? *(Answers may include: Amundsen was an efficient, detail-oriented planner with just one goal in mind—getting to the pole and back. Scott's goal was to get to the pole, but to also do scientific investigations. His planning was more complicated, but he often did not pay attention to details and made bad decisions.)*

Activity: Apsley Cherry-Garrard Journal

amnh.org/resources/rfl/web/antarctica/ej_cherry_garrard.html

Explain that Apsley Cherry-Garrard was a member of Scott's team who made a side trip with two team members to collect Emperor penguin eggs. His journal describes the harshness of the Antarctic climate. Have students read the journal entry. Ask:

- What does this excerpt tell you about the harshness of the Antarctic climate? *(Answers may include: It describes how brutal the climate is.)*
- Why do you think explorers wanted to go to Antarctica despite the challenges? *(Answers will vary. They wanted to do scientific investigations, they wanted to be the first to reach the Pole, etc.)*

SUGGESTED READINGS

Letter from Stephanie: Antarctic Exploration
amnh.org/resources/rfl/pdf/aa_ss06_exploration.pdf

Let's Talk with Donal Manahan about Antarctica's Early Explorers
amnh.org/resources/rfl/pdf/aa_i10_manahan_expl.pdf

Excerpt: The Last March by Robert Falcon Scott
amnh.org/resources/rfl/pdf/aa_e02_scott.pdf

Excerpt: At the Pole by Roald Amundsen
amnh.org/resources/rfl/pdf/aa_e03_amundsen.pdf

Excerpt: Crevasses by Edmund Hillary
amnh.org/resources/rfl/pdf/aa_e07_hillary.pdf

Excerpt: The Voyage of the James Caird by Ernest Shackleton
amnh.org/resources/rfl/pdf/aa_e04_shackleton.pdf

The Last Place on Earth
Huntford, Roland
(Modern Library Paperback Edition), New York: Random House, Inc. 1999
An account of Scott and Amundsen's race to the Pole, a masterpiece of scholarly research and an extraordinarily rich reading experience.

I May Be Some Time: Ice and the English Imagination
Spufford, Francis
New York: Picador U S A (distributed by St. Martin's Press), 1999.
A thrilling cultural history that offers new insights into the immense philosophical and cultural implications of the British love affair with ice.

ONLINE RESOURCES

Antarctica: The Farthest Place Close to Home
amnh.org/resources/antarctica
This award-winning curriculum connects students to the continent's biology and geology, and helps them master important science skills. Easily tailored to your time frame and grade level.

RACE *to the End* OF THE EARTH

STUDENT WORKSHEET

Grades 9–12

As you walk through the *Race to the End of the Earth* exhibition you will examine the roles and contributions of two explorers, Robert Falcon Scott and Roald Amundsen. You will identify aspects of each team's journey and analyze the results.

	AMUNDSEN'S TEAM	SCOTT'S TEAM
1 Look at the **shelter** each team constructed. How did they differ? Which would you have preferred to live in and why?		
2 Describe the **clothing** each team wore. How was each team's clothing suited to Antarctic conditions?		
3 What mode(s) of **transportation** did each team use? Which was most effective and why?		
4 How did the **food** each team brought differ? What impact did bringing a fifth man to the pole have on Scott's food supply?		
5 What role did **planning** play in the success or failure of reaching the South Pole? Who do you think was the better planner? Support your answer.		
6 How would you characterize each **leader**?		

RACE *to the End* OF THE EARTH

STUDENT WORKSHEET

Grades 9–12

ANSWER KEY

As you walk through the *Race to the End of the Earth* exhibition you will examine the roles and contributions of two explorers, Robert Falcon Scott and Roald Amundsen. You will identify aspects of each team's journey and analyze the results.

	AMUNDSEN'S TEAM	SCOTT'S TEAM
1 Look at the **shelter** each team constructed. How did they differ? Which would you have preferred to live in and why?	*(Sample Answers: A wooden hut but during the winter Amundsens and his men dug a network of tunnels and rooms under the snow, including a bathroom and sauna.)*	*(Sample Answers: above ground, prefabricated hut with kitchen, darkroom, men's quarters (bunks), Scott's study, dining area.)*
2 Describe the **clothing** each team wore. How was each team's clothing suited to Antarctic conditions?	*(Sample Answers: Clothing made of fur, which at times was too warm and was not wind-proof)*	*(Sample Answers: Layers of clothing made of tightly woven wool with wind-proof canvas pants and tunics.)*
3 What mode(s) of **transportation** did each team use? Which was most effective and why?	*(Sample Answers: Dogs, sledges and skis* *Amundsen's mode of travel proved most effective, because skis and sledges proved to be faster than manhauling.)*	*(Sample Answers: Dogs, sledges, ponies, motorized sledge, manhauling.* *Scott's use of ponies and the motorized sledges failed.)*
4 How did the **food** each team brought differ? What impact did bringing a fifth man to the pole have on Scott's food supply?	*(Sample Answers: biscuits, crackers water, stew of pemmican or dog meat, crumbled biscuits and water.)*	*(Sample Answers: pemmican and biscuits made into a stew called "hoosh." Tea, cocoa, butter, and sugar. The food supply was planned to last a four-man team for 5 weeks. Adding a fifth man meant the food would last only 4 weeks.)*
5 What role did **planning** play in the success or failure of reaching the South Pole? Who do you think was the better planner? Support your answer.	*(Answers may include: Planning played a crucial role in reaching the pole.* *Students may choose Amundsen as the better planner, because he reached the pole first. Some students may choose Scott, pointing out that he was not only planning for the pole, but also conducting scientific investigations.)*	
6 How would you characterize each **leader**?	*(Answers will vary. Students should support their answers.)*	

Race to the End of the Earth • New York State Science Core Curriculum

KEY: LE = Living Environment
PS = Physical Setting

● = Content alignment addressed in-depth in exhibition section
o = Contnet alignment addressed in some depth in exhibition section

ELEMENTARY SCHOOL

Standard	Major Understandings	Introduction	First Glimpses	The Race Begins	Two Teams: One Goal	To the Pole!	Back from the Pole	Aftermath	Antarctica Today
LE 4	1.1a: Animals need air, water, and food in order to live and thrive.								●
	3.1a: Each animal has different structures that serve different functions in growth, survival, and reproduction.	●			●				●
	3.1c: In order to survive in their environment, plants and animals must be adapted to that environment	●			●				●
	5.1b: An organism's external physical features can enable it to carry out life functions in its particular environment.	●			●				●
	5.3a: Humans need a variety of healthy foods, exercise, and rest in order to grow and maintain good health.					o	o		
PS 4	1.1a: Natural cycles and patterns include the length of daylight and darkness varying with the seasons.				●				
	3.1b: Matter has properties color, hardness, odor, sound, taste, etc. that can be observed through the senses.	●			●				
PS 7	Connections: The knowledge and skills of mathematics, science, and technology are used together to make informed decisions and solve problems, especially those relating to issues of science/technology/society, consumer decision making, design, and inquiry into phenomena.				●	●	●		
	Strategies: Solving interdisciplinary problems involves a variety of skills and strategies, including effective work habits; gathering and processing information; generating and analyzing ideas; realizing ideas; making connections among the common themes of mathematics, science, and technology; and presenting results.				●	●	●		

MIDDLE SCHOOL

Standard	Major Understandings	Introduction	First Glimpses	The Race Begins	Two Teams: One Goal	To the Pole!	Back from the Pole	Aftermath	Antarctica Today
LE 4	3.2b: Extinction of a species occurs when the environment changes and the adaptive characteristics of a species are insufficient to permit its survival. Extinction of species is common. Fossils are evidence that a great variety of species existed in the past.								●
	3.2c: Many thousands of layers of sedimentary rock provide evidence for the long history of Earth and for the long history of changing life forms whose remains are found in the rocks. Recently deposited rock layers are more likely to contain fossils resembling existing species.						O		●
	5.1g: The survival of an organism depends on its ability to sense and respond to its external environment.					O	O		
	5.1a: Animals and plants have a great variety of body plans and internal structures that contribute to their ability to maintain a balanced condition.	O			O				●
	5.1b: An organism's overall body plan and its environment determine the way that the organism carries out the life processes.	O			O				●
	5.1f: Regulation of an organism's internal environment involves sensing the internal environment and changing physiological activities to keep conditions within the range required for survival. Regulation includes a variety of nervous and hormonal feedback systems.								●
	5.1g: The survival of an organism depends on its ability to sense and respond to its external environment.					O	O		
	5.2b: Foods contain a variety of substances, which include carbohydrates, fats, vitamins, proteins, minerals, and water. Each substance is vital to the survival of the organism.					●			
	5.2d: Energy in foods is measured in Calories. The total caloric value of each type of food varies. The number of Calories a person requires varies from person to person.					●			
	5.2e: In order to maintain a balanced state, all organisms have a minimum daily intake of each type of nutrient based on species, size, age, sex, activity, etc. An imbalance in any of the nutrients might result in weight gain, weight loss, or a diseased state.					●			
	6.1b: Food webs identify feeding relationships among producers, consumers, and decomposers in an ecosystem.								●

PS 4	1.1f: The latitude/longitude coordinate system and our system of time are based on celestial observations.		●		●				
	1.1i: The tilt of Earth's axis of rotation and the revolution of Earth around the Sun cause seasons on Earth. The length of daylight varies depending on latitude and season.				●				
	2.1f: Fossils are usually found in sedimentary rocks. Fossils can be used to study past climates and environments.								●
	2.2d: Continents fitting together like puzzle parts and fossil correlations provided initial evidence that continents were once together.								●
	2.2e: The Theory of Plate Tectonics explains how the "solid" lithosphere consists of a series of plates that "float"on the partially molten section of the mantle. Convection cells within the mantle may be the driving force for the movement of the plates.								●
	2.2m: Most local weather condition changes are caused by movement of air masses.								O
	2.2n: The movement of air masses is determined by prevailing winds and upper air currents.								O
	3.1a: Substances have characteristic properties. Some of these properties include color, odor, phase at room temperature, density, solubility, heat and electrical conductivity, hardness, and boiling and freezing points.					●			
	3.1h: Density can be described as the amount of matter that is in a given amount of space. If two objects have equal volume, but one has more mass, the one with more mass is denser .					●			
PS 7	Connections: The knowledge and skills of mathematics, science, and technology are used together to make informed decisions and solve problems, especially those relating to issues of science/technology/society, consumer decision making, design, and inquiry into phenomena.			●	●	●	●		
	Strategies: Solving interdisciplinary problems involves a variety of skills and strategies, including effective work habits; gathering and processing information; generating and analyzing ideas; realizing ideas; making connections among the common themes of mathematics, science, and technology; and presenting results.			●	●	●	●		

HIGH SCHOOL

Standard	Major Understandings	Introduction	First Glimpses	The Race Begins	Two Teams: One Goal	To the Pole!	Back from the Pole	Aftermath	Antarctica Today
LE 4	3.1l Extinction of a species occurs when the environment changes and the adaptive characteristics of a species are insufficient to allow its survival. Fossils indicate that many organisms that lived long ago are extinct. Extinction of species is common; most of the species that have lived on Earth no longer exist.						O		●
	5.2a Homeostasis in an organism is constantly threatened. Failure to respond effectively can result in disease or death.					●	●		
	5.2h Disease may also be caused by inheritance, toxic substances, poor nutrition, organ malfunction, and some personal behavior. Some effects show up right away; others may not show up for many years. .					●	●		
	5.3b Feedback mechanisms have evolved that maintain homeostasis. Examples include the changes in heart rate or respiratory rate in response to increased activity in muscle cells, the maintenance of blood sugar levels by insulin from the pancreas, and the changes in openings in the leaves of plants by guard cells to regulate water loss and gas exchange.								●
PS 4	1.1c Earth's coordinate system of latitude and longitude, with the equator and prime meridian as reference lines, is based upon Earth's rotation and our observation of the Sun and stars.			●		●			
	1.2i The pattern of evolution of life-forms on Earth is at least partially preserved in the rock record.						O		●
	1.2j Geologic history can be reconstructed by observing sequences of rock types and fossils to correlate bedrock at various locations.						O		●
	2.1c Weather patterns become evident when weather variables are observed, measured, and recorded. These variables include air temperature, air pressure, moisture relative humidity and dewpoint, precipitation rain, snow, hail, sleet, etc., wind speed and direction, and cloud cover.				●		●		O
	2.1d Weather variables are measured using instruments such as thermometers, barometers, sychrometers, precipitation gauges, anemometers, and wind vanes.				●		●		O
	2.1o Plate motions have resulted in global changes in geography, climate, and the patterns of organic evolution.								●

PS 7	Connections: The knowledge and skills of mathematics, science, and technology are used together to make informed decisions and solve problems, especially those relating to issues of science/technology/society, consumer decision making, design, and inquiry into phenomena.			●	●	●	●		
	Strategies: Solving interdisciplinary problems involves a variety of skills and strategies, including effective work habits; gathering and processing information; generating and analyzing ideas; realizing ideas; making connections among the common themes of mathematics, science, and technology; and presenting results.			●	●	●	●		

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ELEMENTARY SCHOOL

Standard	Major Understandings	Introduction	First Glimpses	The Race Begins	Two Teams: One Goal	To the Pole!	Back from the Pole	Aftermath	Antarctica Today
2: World History	2.1a: Read historical narratives, myths, legends, biographies, and autobiographies to learn about how historical figures lived, their motivations, hopes, fears, strengths, and weaknesses.		●	●	●	●	●		
	2.2d: Compare important events and accomplishments from different time periods in world history		●	●	●	●	●		●
	2.3a: Understand the roles and contributions of individuals and groups to social, political, economic, cultural, scientific, technological, and religious practices and activities.		●	●	●	●	●	●	
	2.4c: View historic events through the eyes of those who were there, as shown in their art, writings, music, and artifacts.		●	●	●	●	●		
3: Geography	3.1c: Locate places within the local community, State, and nation; locate the Earth's continents in relation to each other and to principal parallels and meridians		●	●	o				●
	3.2a: Ask geographic questions about where places are located; why they are located where they are; what is important about their locations; and how their locations are related to the location of other people and places.	●	●	●					

MIDDLE SCHOOL

Standard	Major Understandings	Introduction	First Glimpses	The Race Begins	Two Teams: One Goal	To the Pole!	Back from the Pole	Aftermath	Antarctica Today
2: World History	2.1c: Interpret and analyze documents and artifacts related to significant developments and events in world history		●	●	●	●	●		
	2.4a: Explain the literal meaning of a historical passage or primary source document, identifying who was involved, what happened, where it happened, what events led up to these developments, and what consequences or outcomes followed.		●	●	●	●	●		
	2.4c: View history through the eyes of those who witnessed key events and developments in world history by analyzing their literature, diary accounts, letters, artifacts, art, music, architectural drawings, and other documents		●	●	●	●	●		

3: Geography	3.1a: Map information about people, places, and environments		•	•	o				•
	3.1b: understand the characteristics, functions, and applications of maps, globes, aerial and other photographs, satellite-produced images, and models		•	•	o				•

HIGH SCHOOL

Standard	Major Understandings	Introduction	First Glimpses	The Race Begins	Two Teams: One Goal	To the Pole!	Back from the Pole	Aftermath	Antarctica Today
2: World History	2.2c: Analyze evidence critically and demonstrate an understanding of how circumstances of time and place influence perspective		•	•	•	•	•		
	2.4b: Interpret and analyze documents and artifacts related to significant developments and events in world history		•	•	•	•	•		
3: Geography	3.1a: Understand how to develop and use maps and other graphic representations to display geographic issues, problems, and questions		•	•	o				•
	3.1b: Describe the physical characteristics of the Earth's surface and investigate the continual reshaping of the surface by physical processes and human activities			•					•
	3.1e: Analyze how the forces of cooperation and conflict among people influence the division and control of the Earth's surface								•