3 Antarctica Exploration

Antarctica was the very last continent to be discovered on our planet. Its far distance from other land masses and the icy waters that surround it made exploration nearly impossible. It's widely believed that Captain James Cook, an English explorer, was the first to cross through the Antarctic Circle in 1773. Like the equator, the Antarctic Circle is an imaginary line around the globe that people use to help describe locations on Earth. The Antarctic Circle is in the southern hemisphere and the continent of Antarctica lies south of the Antarctic Circle. While Captain Cook didn't sight land, it was the first time an explorer had ever journeyed that far south.

Although there is much debate as to when the first explorer laid eyes on Antarctica and who actually stepped foot on the continent first, most historians agree Cartsen Borchgrevink and his crew were the first to spend an entire year on the icy land. Borchgrevink, a Norwegian scientist, is said to have landed at Cape Adare in February of 1899. He and his crew members then built huts on the shore and wintered on the land until their departure in February of 1900.

Borchgrevink was just the beginning of what is known as the Heroic Age of Antarctic Exploration — a time of historic journeys across this frozen region. Starting in the late 19th century and spanning throughout 1922, this period of exploration saw some of the most profound Antarctic discoveries and produced a set of storied explorers from around the world.

In 1901, sailing aboard the ship *Discovery*, Robert Falcon Scott began his first journey to Antarctica with a crew that included a physicist, a geologist, a naturalist, a botanist and a surgeon, among others. While their expedition consisted of many scientific explorations, the core of their trip was to reach the South Pole. Unfortunately, Scott and his crew turned back before they reached their final destination; however, they held the title for "furthest southern journey" for a number of years following their attempt. By 1904, Scott and his remaining crew left Antarctica and made their way back north. Scott's initial ship, the *Discovery*, is now on public display for future explorers to visit in Dundee, Scotland.

Ernest Henry Shackleton joined Scott on his 1901 journey to Antarctica and would return two more times during his life. The first Shackleton-led Antarctic exploration commenced in 1908 aboard the ship *Nimrod*. After reaching land, Shackleton and his crew conducted various research from meteorological to biological projects. Once spring came, Shackleton and his crew of three others set out to reach the South Pole. While the group did not reach their destination, they did make it further south than Scott's initial expedition years earlier. Shackleton and the remaining *Nimrod* crew members returned home and Shackleton soon began planning his next Antarctic adventure.

Roald Amundsen was no stranger to the Antarctic region — he had been part of the first ever crew to winter in the waters surrounding the continent in 1899. However, in 1910, Amundsen led his own expedition to Antarctica aboard the ship *Fram*. The *Fram* was unique in that it was built specifically for these types of explorations — rather than having a previous life as a coal ship or something similar, the ship was designed to withstand run-ins with the inevitable pack-ice it would encounter in icy waters. The *Fram* was perfect for their journey and the Amundsen-led crew reached the Bay of Whales and setup camp in early 1911. They named their camp Framheim, which means "home of the *Fram*" in the Norwegian language. The crew used the remaining summer months to construct many **depots** that would assist them in their journey to the South Pole in the spring. On December 14, Amundsen and a crew of four other men reached the South Pole — the very first time in history. They constructed a small tent,

left a letter inside and began their journey back to the coast. The public can now view the famous *Fram* ship and learn about its many polar expeditions at The Fram Museum in Norway.

At the same time as Amundsen's exploration, Robert Falcon Scott had begun another attempt at reaching the South Pole via the ship *Terra Nova*. Scott and his crew made landfall in January 1911 and unloaded their supplies on Ross Island. The *Terra Nova* then journeyed east in an effort to conduct additional scientific research — on their way back to Ross Island, the crew encountered Amundsen's *Fram* in the Bay of Whales. While Scott was noted as being a bit disappointed to learn Amundsen's crew was so close, he carried on with his initial plan and set out for the South Pole. On January 17, 1912, Scott and four other crew members finally reached their destination, only to find the note left by Amundsen from a month earlier.

In 1921, Shackleton began preparations to explore Antarctica once more aboard the ship *Quest*. Unfortunately, in January 1922, Shackleton passed away during his journey south — this marked the end of the Heroic Age of Antarctic Exploration.

While this heroic age might have ended in 1922, the fascination with Antarctica and desire to explore this frozen land did not cease. As technology advanced and ships became better suited for icy water, scientists and researchers from around the world began to journey to Antarctica more frequently. There became so much interest in this land from so many different countries that a treaty was signed to insure Antarctica would remain a peaceful place with a freedom of scientific research and information sharing. This treaty is called The Antarctica Treaty and was signed in December 1959 by the 12 countries active in the International Geophysical Year (IGY) in 1957-58. The IGY was the first major multi-national research program to take place in Antarctica including Argentina, Australia, Belgium, Chile, France, Japan, New Zealand, Norway, South Africa, United Kingdom, United States and the former Soviet Union.

Prior to the IGY, most of the initial 12 nations had already constructed permanent research stations throughout Antarctica. The United States established McMurdo Station in December of 1955 on Ross Island and it serves as the core of the U.S. Antarctic Program. McMurdo Station includes landing strips for planes, a harbor for ships, a helicopter pad and over 80 buildings serving as dormitories, stores, administration offices and much more. Research conducted at McMurdo Station ranges from biology and medicine to geology and astrophysics. You'll even find participants of the Antarctic Artists and Writers Program around the station.

Grades **2-3** | Content Areas **Art, Social Studies, ELA**

Looking Through The Spyglass

ESSENTIAL QUESTIONS

What is a spyglass? How did a spyglass help explorers on their journey? Which explorer goals need to change when expectations and predictions aren't met?

Materials

- *Activity Sheet: Looking Through The Spyglass*
- *Activity Sheet: Spyglass Creation*
- two 1 inch strips of cardstock paper for each student
- scissors
- non-toxic glue
- small binder clips
- paper for sketching
- clear plastic sheet protectors
- tape
- small paint brushes
- acrylic craft paints
- acrylic sealer
- glue gun
- decorative loose parts (sequins, stickers, beads, etc.)

For Each Group of 4 Students

- a paper towel roll
- paper cup
- paints (iridescent paints are a good choice for decorating the telescopes)

Vocabulary

- landfall
- landscape
- magnification
- navigation
- prediction

WARM UP

Explain to students one of the tools early explorers used to navigate their way to unknown lands was a small telescope called a spyglass. Discuss how a spyglass makes objects in the distance appear closer, providing explorers with more detail as they observe their surroundings. Students will make cardboard spyglasses with interchangeable painted lenses that 1) show what they might expect to see as an Antarctic explorer upon landfall, and 2) show what explorers actually did see when they made landfall. Ask students to complete the "what would you expect to see" column on *Activity Sheet: Looking Through The Spyglass*. Then, instruct students to work in small groups of four to complete *Activity Sheet: Spyglass Creation.*

MAKING A SPYGLASS

First, have students go to *Activity Sheet: Looking Through The Spyglass* to complete the first column: "What would you expect to see?" Second, have them complete steps 1-2 of *Activity Sheet: Spyglass Creation* to draw spyglass images of what things they would expect to see on landfall. Then, request students listen to a book read aloud about features of Antarctica, such as Rebecca Hirsch's *Antarctica*. Students are now equipped to discuss which of their predictions were correct and which were not. Third, students fill in column 2 of *Activity Sheet: Looking Through The Spyglass* —"what did explorers actually see?" Finally, students will make another lens image that shows what explorers did see upon landfall (a natural landscape with no people or research station, but with abundant natural wildlife, ice shelves and penguin colonies).

WRAP UP

After the spyglasses are finished, students in small groups take turns looking through the spyglasses at the images each student created. They compare how their predictions were the same or different from the second lens of what explorers actually saw. How would an explorer have to adjust his or her approach to exploration if their expectations and predictions were wrong? What effect would having wrong expectations have on: type of equipment, plans for scientific studies, collecting data, where to make landfall?

How Does a Spyglass Work?

A spyglass works by using glass lenses. One lens is used to magnify the image you are looking at and bring it closer to your eye. The other lens is used to gather the light and bend it into focus, so you can see the image in sharp details instead of fuzzy shapes.

Disney nature PENGUINS

Activity
GRADES 2-3

LOOKING THROUGH THE SPYGLASS

NAME _____ DATE _____

	1 What would you expect to see?	2 What did explorers actually see?
Types of people:		
Types of animals:		
Landscape-landforms, vegetation:		
Types of weather:		
Other:		

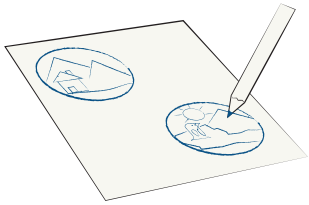
Disney nature PENGUINS

Activity
GRADES 2-3

SPYGLASS CREATION

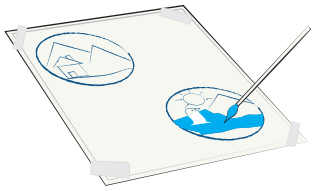
Make two lenses:

1. Measure and cut a strip of cardstock to fit around the outer edge of a paper cup, leaving an extra .5 in (1.5 cm) for overlap. Form a ring and glue together the ends of the cardstock. Secure the seam with a binder clip and leave to dry. Repeat to make a second ring.



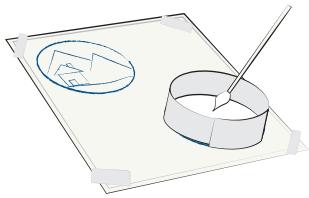
2. Use the paper cup to trace a circle on sketching paper. Draw a picture of **what things you'd expect to see** through the spyglass upon landfall.

3. Use the paper cup to trace another circle on sketching paper. In the second circle, draw a picture of **what explorers actually saw.**



4. Tape the plastic sheet protector over your sketches. Use craft paint to color in your images on the plastic, using the sketches underneath as a guide. Allow to dry completely.

5. Place a cardstock ring over your painting. Apply a heavy coat of acrylic sealer on top of the painting so that the acrylic sealer covers both the painting and the inside edge of the ring. Repeat for the second image and allow to dry overnight.



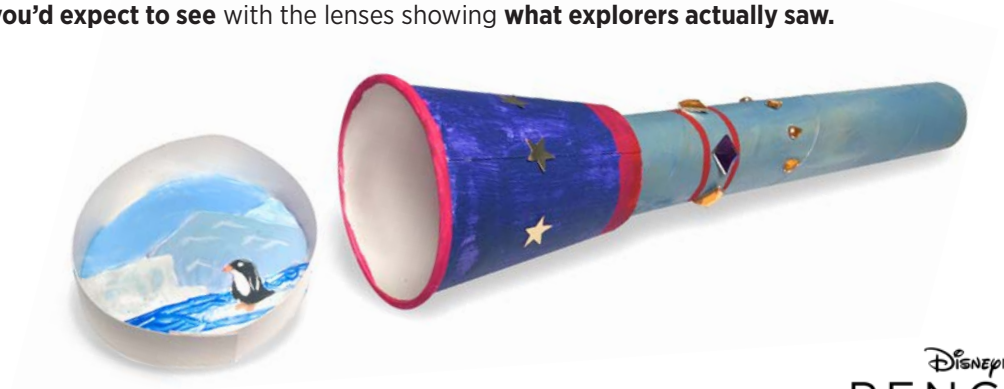
6. Once completely dry, peel away the plastic sheet protector. The paintings will remain on the acrylic sealer. These are the interchangeable landscape lenses for the spyglass.

Make one spyglass for a group of four:

1. Place the paper towel roll on the bottom of the paper cup and trace around the roll. Cut out the circle so that the paper towel roll can fit through the bottom of the cup. Glue the paper towel roll in place using the glue gun.

2. Paint and decorate the spyglass with sequins, beads, stickers or other items.

3. Once dry, take turns placing the landscape lenses on the end of the spyglass. When the telescope is aimed at the window or a light, the translucent image will be seen at the end of the spyglass. Compare the lenses showing **what you'd expect to see** with the lenses showing **what explorers actually saw.**



Disney nature PENGUINS

Grades **4-6** | Content Areas **Social Studies & ELA**

Antarctica Explorer Scrapbooks

ESSENTIAL QUESTIONS

What hardships did each team overcome to make discoveries and contribute scientific knowledge? What are the characteristics of explorers?

Materials

- *Activity Sheet: Scrapbook Table of Contents & Explorer Data*
- pencils

Vocabulary

- agitated
- cairn
- depot
- Fram
- Framheim
- man-hauling
- pemmican
- skua gulls
- sledge
- Terra Nova
- Vidda

WARM UP

a) As a class, discuss how the history of Antarctica is an adventure story of exploration. Speculate as to why some people lead expeditions in harsh locations such as Antarctica. Some examples might include scientific discovery, testing strength and wit while living in an unforgiving environment, charting geography of the inlands or charting the coasts and seas surrounding Antarctica. Discuss why students think it might be important to some explorers to be the first to explore a land.

b) In small groups, ask students to conduct research about explorers Robert Falcon Scott, Ernest Shackleton and Roald Amundsen. Students should search for and deeply examine primary source documents (see resource section for links and excerpts) such as diary entries of the explorers. To aid research, students should utilize *Activity Sheet: Scrapbook Table of Contents & Explorer Data*. Following research, students will be asked to complete a South Pole Exploration Timeline based on what they've found. Finally, ask students to consider the character traits that promote a life of exploration.

REFLECTING ON ANTARCTICA'S AGE OF EXPLORATION

Have students work in small groups using books, websites, and primary sources, such as diaries and maps, to make an Antarctica Explorer Scrapbook using file folders. Students will share scrapbooks, complete Explorer Comparison Charts and discuss their Exploration Timelines.

WRAP UP

Student groups will share their scrapbooks with the rest of the class and then discuss the following questions as a class.

a) How have the diaries changed over time?

b) Which character traits motivated explorations in foreign lands?

c) What character traits impacted their leadership skills?

d) What do students think will be the next great exploration area?

FAUX LEATHER FILE FOLDER SCRAPBOOK

Materials

- tissue paper cut into 5" squares
- acrylic sealer
- brown acrylic paint
- sponge or paint brushes
- newspaper
- 9 sheets of copy paper per group

Faux Leather Steps

1. Mix a few drops of brown acrylic paint into acrylic sealer.
2. Place opened file folder (outside showing) on sheet of newspaper.
3. Using the brown acrylic sealer, paint about 1/4 of the file folder surface at a time. Carefully place overlapping tissue squares on the wet acrylic sealer & continue until the surface is covered (squares will wrinkle).
4. Slightly bend on the fold and stand up like a tent. After the acrylic sealer dries, apply another layer if needed.

Add Pages

1. Open the folder.
2. Place 9 sheets of paper between fold and edge on non-treated side with folder tab at top.
3. Position 5 staples on the left edge of stack of pages.
4. Add research information to each page.

Disney nature PENGUINS

Activity
GRADES 4-6

SCRAPBOOK TABLE OF CONTENTS & EXPLORER DATA

NAME _____ DATE _____

Antarctica Explorer Comparison

SHACKLETON	AMUNDSON	SCOTT
Country of origin	Country of origin	Country of origin
Childhood influences to become an explorer	Childhood influences to become an explorer	Childhood influences to become an explorer
Departure Date	Departure Date	Departure Date
Arrival on Antarctica Date	Arrival on Antarctica Date	Arrival on Antarctica Date

SCRAPBOOK TABLE OF CONTENTS

Cover:
Explorer Name

Inside Cover:
Names of students, Teacher's name, Date

Page 1:
About the explorer's life and motive for the expedition

Page 2:
Antarctica map that traces the expedition journey

Page 3:
Timeline of the journey (start and end dates, dates of significant events)

Page 4:
Planning for the expedition or stages of the expedition

Page 5:
Drawings, pictures and diary entries of everyday life — tools, clothing, transportation, chores, entertainment

Page 6:
Drawings, pictures and diary entries of crucial events (obstacles, discoveries, struggles, successes)

Page 7:
Outcomes and summary of expedition

Page 8:
Character traits that helped the explorer through difficult times

Page 9:
List of references and resources

Disney nature PENGUINS

Extension for Grades **2-6** | Content Areas **Music & Social Studies**

A Modern Antarctic Explorer

ESSENTIAL QUESTIONS

What is a soundscape? What are natural-object instruments? How can soundscapes accompanied by natural-object or recycled-object instruments perform in ways that express the mood related to life or conditions on Antarctica?

Materials

- sound recorders
- markers
- paper plates
- rocks
- potato chip tubes with plastic caps
- recycled plastic eggs
- recycled plastic water bottles
- twigs, leaves, gravel
- masking tape
- *Activity Sheet: Natural-Object and Recycled-Object Musical Instruments*

Vocabulary

- acoustic
- ecology
- avant-garde
- sound art
- percussion
- soundscape

WARM UP

Read a book that introduces the concept of exploration, such as *My Season with Penguins: An Antarctic Journal* by Sophie Webb. Discuss with students how scientists and explorers journey to Antarctica to learn more about the wildlife, ecology, or the natural history of our planet in order to predict the future. Some explorers, like Cheryl Leonard, a modern-day Antarctic explorer of the arts created "Polar Music," an avant-garde genre. View Cheryl Leonard's "The Rocks Sing" to see how she designs natural-object instruments and composes music that captures natural sounds and highlights ecological climate change. Students will record soundscapes at their school, make instruments out of natural or recycled objects from their environment and combine them to improvise a composition.

Suggestions for Recording Soundscapes at School

1) Get permission from administration.
2) Record 20-30 seconds of playground sounds.
3) Record 20-30 seconds of lunch-room sounds.
4) Record 20-30 seconds of feet walking in the hallway.
5) Make one recording that combines the soundscapes.

SOUND EXPLORATION

Play the first minute of a Leonard Performance "Greater than 20 Knots" for the class. Instruct students to follow directions to complete the first and second columns on *Activity Sheet: Natural-Object and Recycled-Object Musical Instruments* to create and explore their new instruments.

WRAP UP

Ask students to gather in small groups of 4-5 students and take turns playing along with a 1 to 2-minute soundscape of their school. Following their composition creation, discuss the effects of their natural or recycled musical instruments on the performance as a class. Ask questions such as, what moods were expressed in the different performances, how could soundscapes, collected over time, demonstrate changes in time of day or season at school.

Leonard's Soundscapes & Field Note Recordings Include

- gusts of wind
- Adélie penguin vocalizations
- Adélie penguin footsteps
- seals splashing
- icicles dripping
- icicles falling
- an iceberg melting

Disney nature PENGUINS

Activity
GRADES 2-6

MAKING NATURAL-OBJECT & RECYCLED-OBJECT MUSICAL INSTRUMENTS

NAME _____ DATE _____

Directions: Select at least 2 or 3 objects from natural and recycled items collected at school and follow the steps below to explore your own, unique instrument. Most items will make a percussion instrument. A percussion instrument makes a sound by being gently struck by a stick or rock, scraped by a beater or shaken.

CREATE

List the materials you selected:

_____

_____

_____

_____

Sketch your instrument:

Name your instrument:

PRACTICE

Sketch 2 or 3 different ways to shake or strike your instrument to get different sounds.

Describe each different sound for each movement and what mood it might produce:

SOUND:	**SOUND:**	**SOUND:**
MOOD:	**MOOD:**	**MOOD:**

PRACTICE WITH CLASSMATES

Gather with a small group of 3-4 classmates. Place a check for each task you complete.

- ☐ Establish a beat (4/4 time) for everyone to follow.
- ☐ Take turns being the leader. Watch and follow the movements of the leader's instrument.

Try making the instruments sound:

☐ louder ☐ softer ☐ faster ☐ slower

Talk about how different sound levels or speeds changed the mood or feeling of the sounds.

Disney nature PENGUINS