



CD-404171



EXPLORING

ANTARCTICA

Grades
5-8

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Introduction to the Teacher

Exploring Antarctica is one of the seven books in Mark Twain Media's *Continents of the World Geography Series*. The books are a valuable resource for any classroom. The series can be used to supplement the middle-school geography and social studies curriculum. The books support the goal of the National Geography Standards to prepare students for life in a global community by strengthening geographical literacy.

The intent of the *Continents of the World Geography Series* is to help students better understand the world around them through the study of geography. Each book focuses on one continent. Information and facts are presented in an easy-to-read and easy-to-understand format that does not overwhelm the learner. The text presents only the most important information in small, organized bites to make it easier for students to comprehend. Vocabulary words are boldfaced in the text. For quick reference, these words are listed in a glossary at the back of the book.

The series is specifically designed to facilitate planning for the diverse learning styles and skill levels of middle-school students. Each book is divided into several units. Each unit provides the teacher with alternative methods of instruction.

Unit Features

- Close-Up introduces facts and information as a reading exercise.
- Knowledge Check assesses student understanding of the reading exercise using selected response and constructed response questioning strategies.
- Map Follow-Up provides opportunities for students to report information from a spatial perspective.
- Explore allows students to expand learning by participating in high-interest, hands-on activities.
- Glossary lists the boldfaced words with definitions.

Online Resources

- Reluctant Reader Text: A modified version of the reading exercise pages can be downloaded from www.carsondellosa.com. In the Search box, enter the produce code CD-404171. When you reach the *Exploring Antarctica* product page, click the icon for the Reluctant Reader Text download.
- The readability level of the text has been modified to facilitate struggling readers. The Flesch-Kincaid Readability formula, which is built into Microsoft Word™, was used to determine the readability level. The formula calculates the number of words, sentences, and paragraphs in each selection to produce a reading level.

Additional Resources

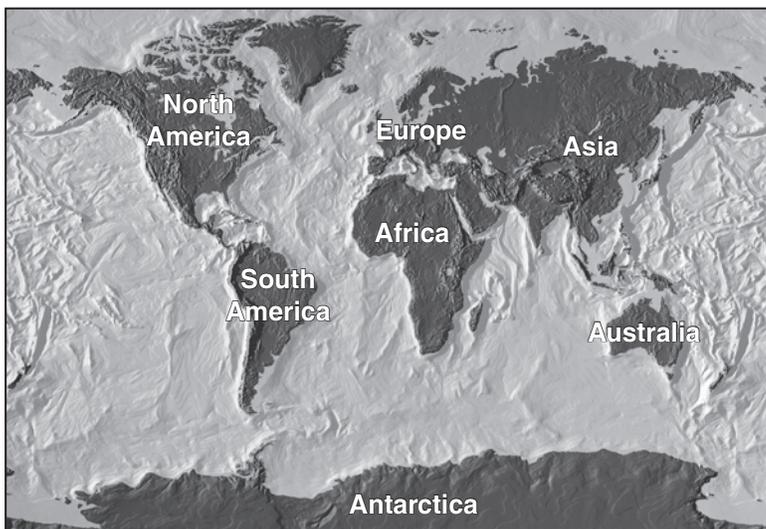
Classroom Decoratives: The *Seven Continents of the World* and *World Landmarks and Locales Topper* bulletin board sets are available through Mark Twain Media/Carson-Dellosa Publishing LLC. These classroom decoratives visually reinforce geography lessons found in the *Continents of the World Geography Series* in an interesting and attention-grabbing way.

The Continents: Close-Up

A **continent** is a large landmass completely or mostly surrounded by water. The continents make up just over 29 percent of the earth's surface. They occupy about 57,100,000 square miles (148,000,000 sq. km). More than 65 percent of the land area is in the Northern Hemisphere.

Landmasses

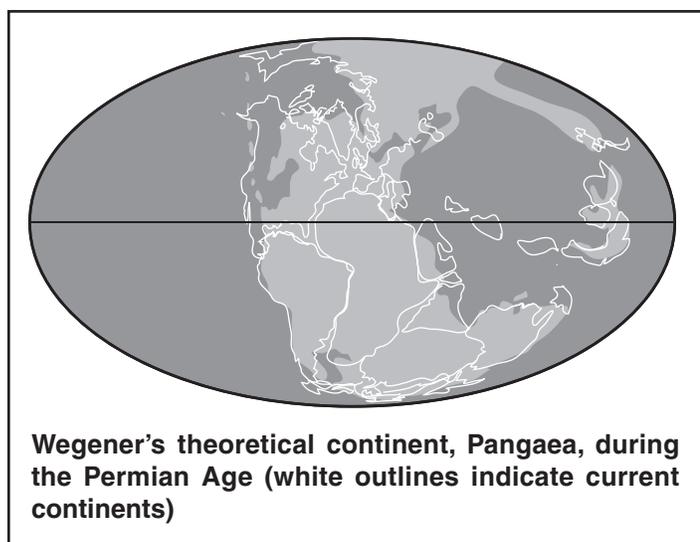
- **Continents:** Geographers list North America, South America, Europe, Asia, Africa, Australia, and Antarctica as continents.
- **Subcontinents:** Greenland and the India-Pakistan area are sometimes referred to as "subcontinents."
- **Microcontinents:** Madagascar and the Seychelles Islands are often called "microcontinents."
- **Oceania:** The island groups in the Pacific Ocean are called Oceania, but they are not considered a continent.



The Continents Today

How Were the Continents Formed?

For many years, Europeans believed the continents were formed by a catastrophe or series of catastrophes, such as floods, earthquakes, and volcanoes. In 1596, a Dutch mapmaker, Abraham Ortelius, noted that the Americas' eastern coasts and the western coasts of Europe and Africa looked as if they fit together. He proposed that once they had been joined but later were torn apart.



Many years later, a German named Alfred Lothar Wegener published a book in which he explained his theory of the "**Continental Drift.**" Wegener, like Ortelius, believed that the earth originally had one supercontinent. He named it **Pangaea** from the Greek word meaning "all lands." He believed that the large landmass was a lighter rock that floated on a heavier rock, like ice floats on water.

Wegener's theory stated that the landmasses were still moving at a rate of about one yard each century. Wegener believed that Pangaea existed in the Permian Age. Then Pangaea slowly divided into two continents,

the upper part, **Laurasia**, and the lower, **Gondwanaland**, during the Triassic Age.

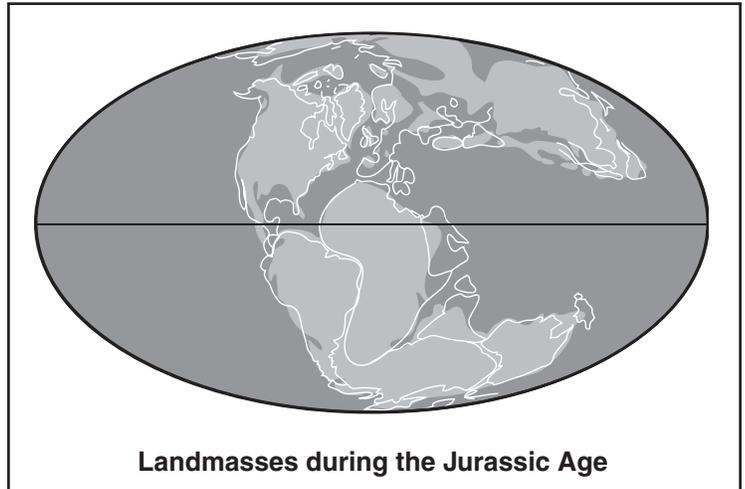
By the Jurassic Age, the landmasses had moved into what we could recognize as the seven continents, although they were still located near each other. Eventually, the continents “drifted” to their present locations.

Most scientists had been in agreement on the continental drift theory until researchers in the 1960s discovered several major mountain ranges on the ocean floor.

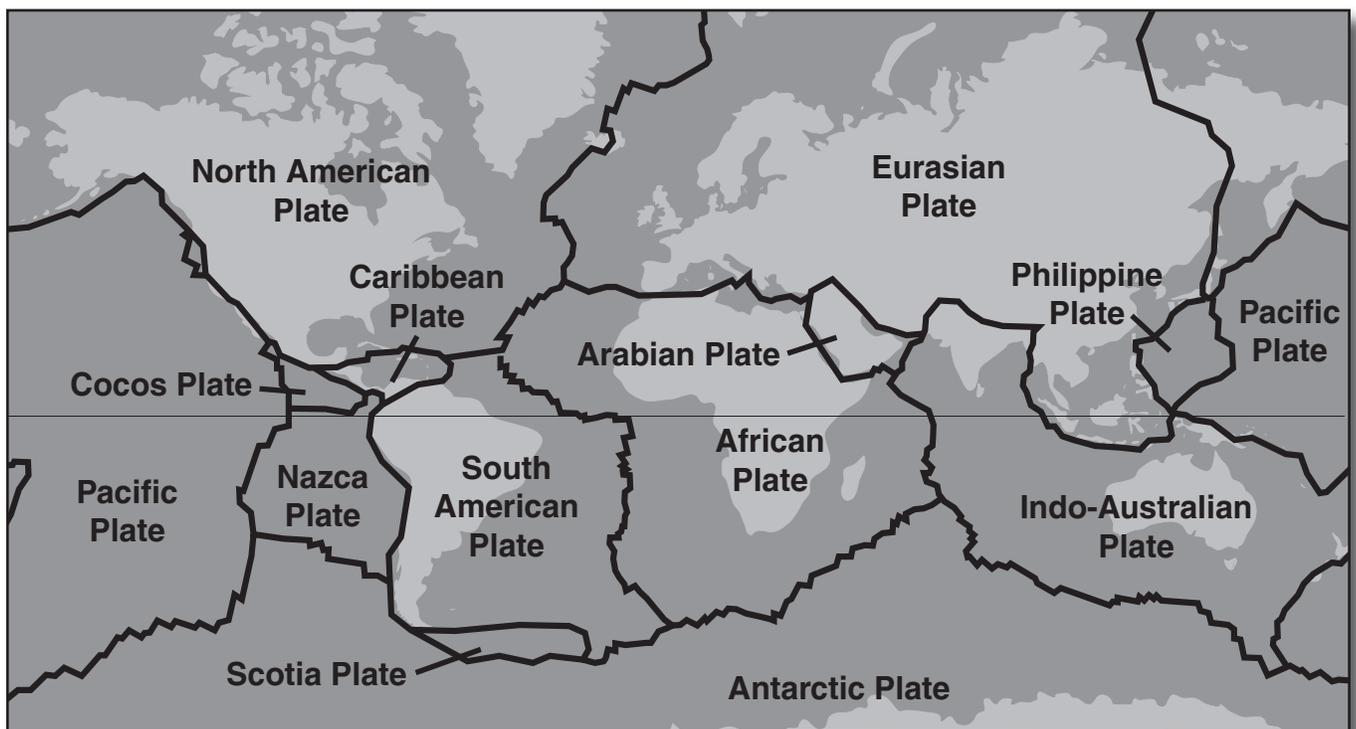
These mountains suggested that the earth’s crust consists of about 20 slabs or **plates**.

These discoveries led to a new theory, “**Plate Tectonics**,” which has become more popular. This theory suggests that these plates move a few inches each year. In some places the plates are moving apart, while in others, the plates are colliding or scraping against each other.

Scientists also discovered that most volcanoes and earthquakes occur along the boundaries of the various plates. Recent earthquakes near Indonesia and Japan along the boundaries of the Indo-Australian, Eurasian, Philippine, and Pacific Plates have triggered devastating tsunamis that killed hundreds of thousands of people. Scientists hope that further study will help them increase their understanding of Earth’s story.



Landmasses during the Jurassic Age



The earth’s crust consists of about 20 plates. Plate tectonics suggest that these plates move a few inches each year.

Name: _____ Date: _____

Knowledge Check

Matching

- | | |
|--------------------------|--|
| _____ 1. Plate Tectonics | a. lower part of Pangaea |
| _____ 2. Laurasia | b. Greek word meaning "all lands" |
| _____ 3. continent | c. theory suggesting that plates move a few inches each year |
| _____ 4. Gondwanaland | d. upper part of Pangaea |
| _____ 5. Pangaea | e. a large landmass completely or mostly surrounded by water |

Multiple Choice

6. He explained his theory of the Continental Drift.
- a. Abraham Ortelius
 - b. Alfred Lothar Wegener
 - c. Pangaea
 - d. Laurasia
7. The earth's crust consists of _____ plates.
- a. about 20
 - b. about 10
 - c. about 5
 - d. about 50

Did You Know?

Earth is thought to be the only planet in our solar system that has plate tectonics.



Constructed Response

Explain how the movement of the earth's plates formed the seven continents. Use two details from the selection to support your answer.

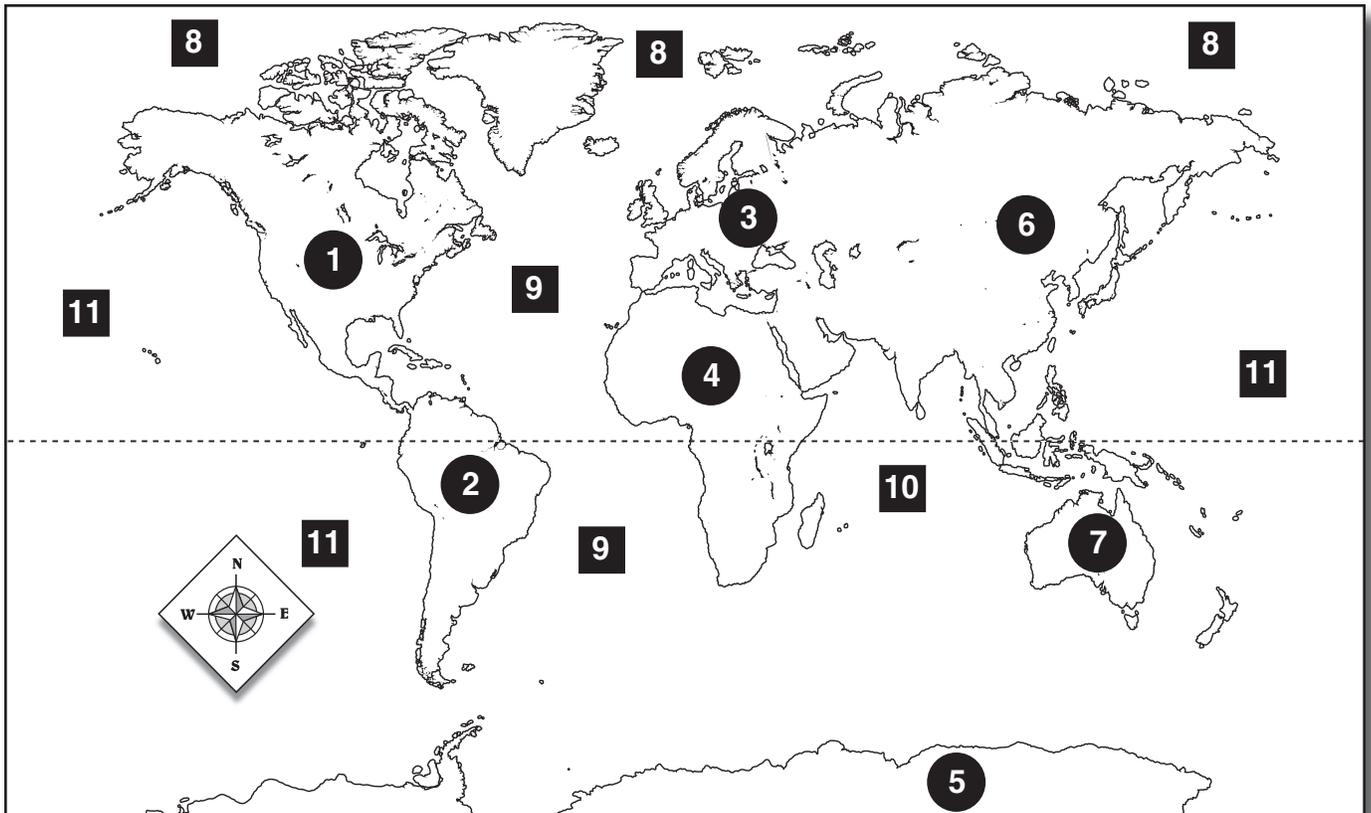
Name: _____ Date: _____

Map Follow-Up

Directions: There are seven continents and four oceans. Match the numbers on the map with the names of the continents and oceans.

- | | | |
|---------------------|---------------------|----------------------|
| _____ Pacific Ocean | _____ Arctic Ocean | _____ Atlantic Ocean |
| _____ Indian Ocean | _____ Africa | _____ Antarctica |
| _____ Asia | _____ Australia | _____ Europe |
| _____ North America | _____ South America | |

Continents and Oceans



Name: _____ Date: _____

Explore: Antarctica Tortilla Map

Materials

blue construction paper (9" X 12")
 black and red markers (fine point)
 outline map of Antarctica
 water
 white chalk

pencil
 scissors
 glue
 atlas
 plastic baggie

tortilla 8" size
 flour
 salt
 mixing bowl

Directions

Day 1

- Step 1: Mix 1/2 cup flour with 1/4 cup salt and 1/4 cup of water in mixing bowl to form a modeling dough.
- Step 2: Place dough in plastic baggie and set aside.
- Step 3: Cut Antarctica from outline map.
- Step 4: Trace and cut the outline from the tortilla. Do not discard the scraps, they can be used for other landforms.
- Step 5: Use the scraps to cut rough shapes of the southernmost parts of South America, South Africa, Australia, and New Zealand. Then cut out islands for Madagascar, Tasmania, and the Falkland Islands.
- Step 6: Place the cutouts on the blue construction paper. Refer to a map from the atlas to position the landforms correctly.
- Step 7: Glue the cutouts on the construction paper.
- Step 8: Mold the dough on the tortilla cutouts to create mountain ranges for the Transantarctic Mountains, Ellsworth Range, and Andes in South America. Let dry overnight.

Day 2

- Step 1: Color in the ice shelf with white chalk.
- Step 2: Label landforms, major oceans and seas, and mountain ranges with black marker.
- Step 3: Draw in the Antarctic Circle with the red marker and label it 66° South.



The Continent of Antarctica: Close-Up

Antarctica is the world's southernmost continent. It surrounds the South Pole, which is the earth's most southern point. Its name means "opposite the Arctic." The Arctic is the earth's northernmost region. Antarctica is approximately 600 miles (1,000 km) from South America, 2,500 miles (4,000 km) from Africa, and 1,600 miles (2,500 km) from Australia.

Antarctica is the fifth-largest continent. It is larger than Australia or Europe. It is slightly less than one and one-half the size of the United States. The **Transantarctic Mountains** divide the continent into two regions, West Antarctica and East Antarctica.

Because of Antarctica's severe weather, it is the only continent that does not have any permanent residents. Twenty-nine nations send scientists to several research stations located on the continent. The population of the research stations varies from about 5,000 in the summer to 1,000 in the winter. In recent years, tourists have begun to visit the continent.

It is bitterly cold and almost completely covered by a huge sheet of ice. The ice is often two miles thick near the center of the continent; it then thins out toward the coastline. This sheet contains about 90 percent of the world's ice. Below the ice, the land area of Antarctica is about the size of Australia. Just over two percent of its area is exposed land. Much of the land that is exposed is mountaintops.

As snow falls in the central region, it forces the ice sheet to move very slowly toward the coastlines. Often, when the ice reaches the water's edge, it floats, creating an **ice shelf**. Antarctica has several ice shelves. The two largest are the Ross Ice Shelf and the Ronne Ice Shelf. The Ross Ice Shelf is about 4,000 feet (1,219 m) thick in places. Often, pieces break off the ice shelves and form icebergs.

Antarctica is surrounded by water, including the southern parts of the Atlantic, Pacific, and Indian Oceans. Sometimes, the waters off Antarctica's coast are referred to as the Antarctic Ocean or the **Southern Ocean**. Also along its coasts are the Amundsen, Ross, and Weddell Seas.

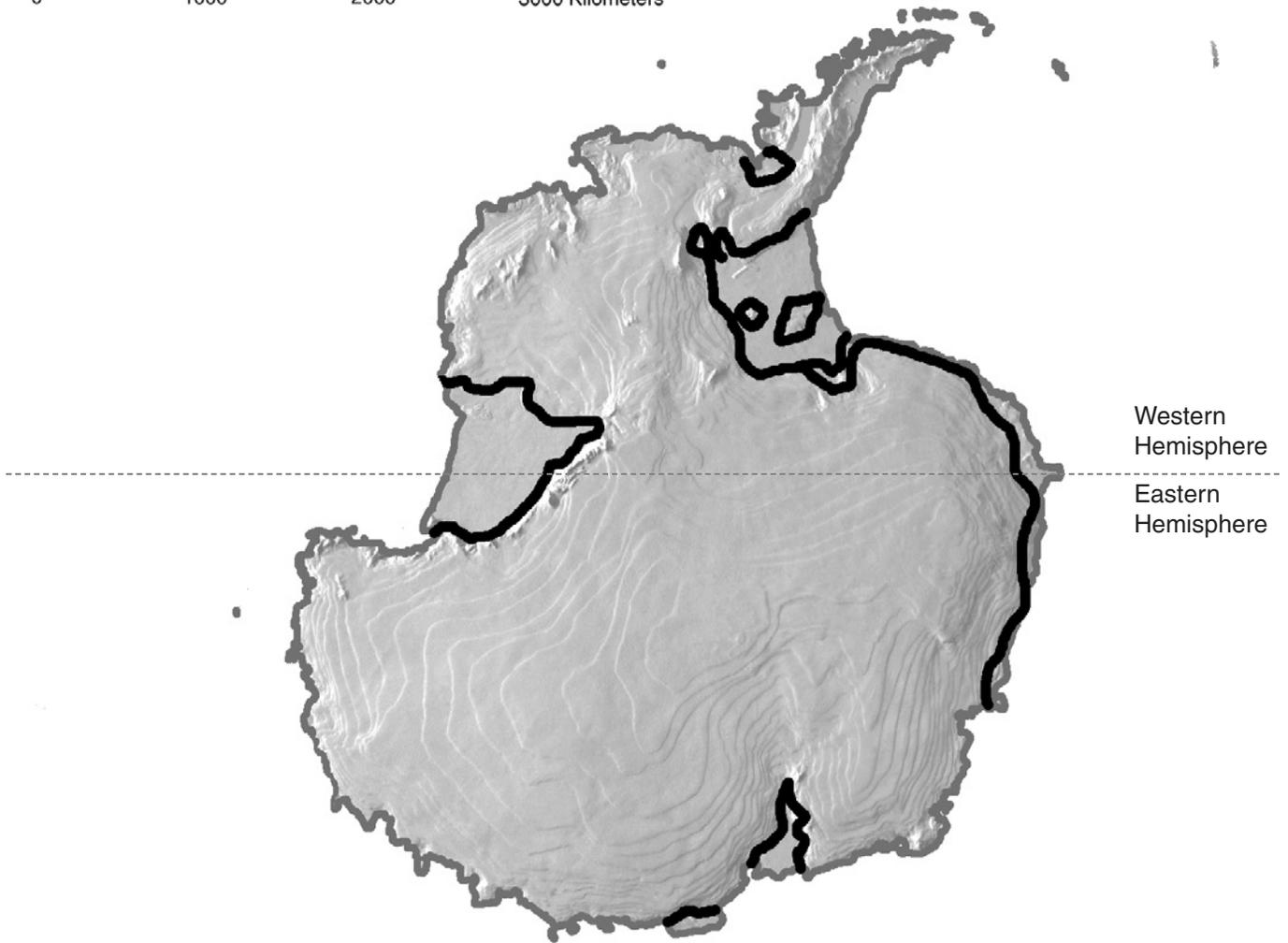
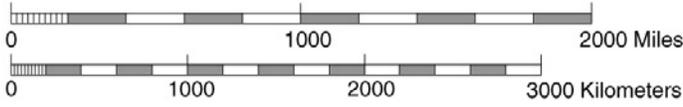
Antarctica is the world's highest continent. Its average elevation is over 6,500 feet (2,000 m) above sea level. Its highest point is **Vinson Massif**, which is 16,864 feet (5,140 m) high; its lowest point is on the Southern Ocean at zero feet (sea level).



Ice covering Lake Fryxell in the Transantarctic Mountains comes from the melting of the Canada Glacier.

Name: _____ Date: _____

Outline Map of Antarctica



Black outlines indicate coastline covered by ice shelves.

Name: _____ Date: _____

Knowledge Check

Matching

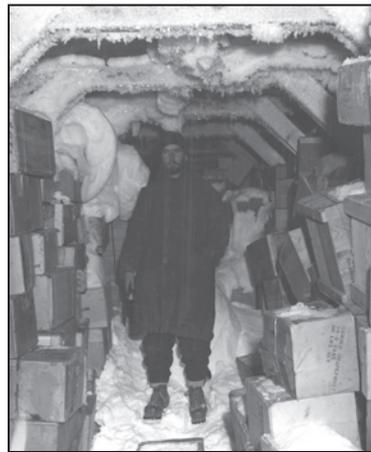
- | | |
|-----------------------------------|--|
| _____ 1. Antarctica | a. ice reaching the water's edge and floating creates this |
| _____ 2. ice shelf | b. the waters off Antarctica's coast are sometimes called this |
| _____ 3. Transantarctic Mountains | c. "opposite the Arctic" |
| _____ 4. Southern Ocean | d. Antarctica's highest point |
| _____ 5. Vinson Massif | e. divides Antarctica into two regions |

Multiple Choice

6. Which continent is closest to Antarctica?
- North America
 - South America
 - Africa
 - Australia
7. What is the population of Antarctica in the summer?
- about 10,000
 - about 50
 - about 5,000
 - about 100

Did You Know?

Scientists recorded the world's coldest temperature, 128.6 degrees below zero (Fahrenheit), in Antarctica.



Constructed Response

Explain the difference between an ice shelf and an iceberg. Use details from the selection to support your answer.

Name: _____ Date: _____

Map Follow-Up

Directions: Match the names below with the numbers on the map. Draw the mountain symbol on the map to indicate the location of the Transantarctic Mountains. Label the mountains.

_____ Antarctic Peninsula

_____ Ronne Ice Shelf

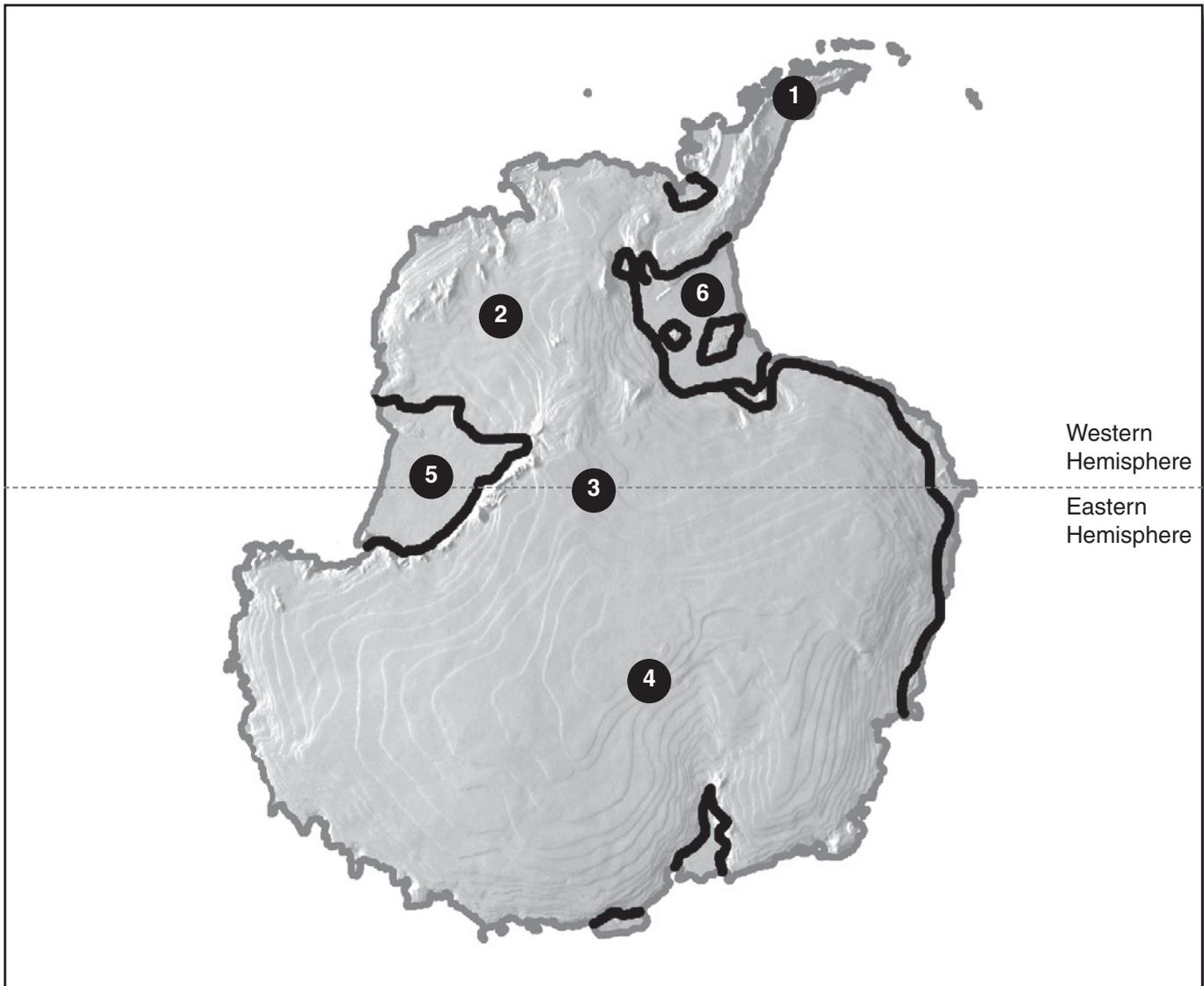
_____ Eastern Antarctica

_____ Ross Ice Shelf

_____ Western Antarctica

_____ South Pole

Features of Antarctica



Name: _____ Date: _____

Map Follow-Up

Directions: Match the names below with the numbers on the map.

_____ Weddell Sea

_____ Southern Ocean

_____ Atlantic Ocean

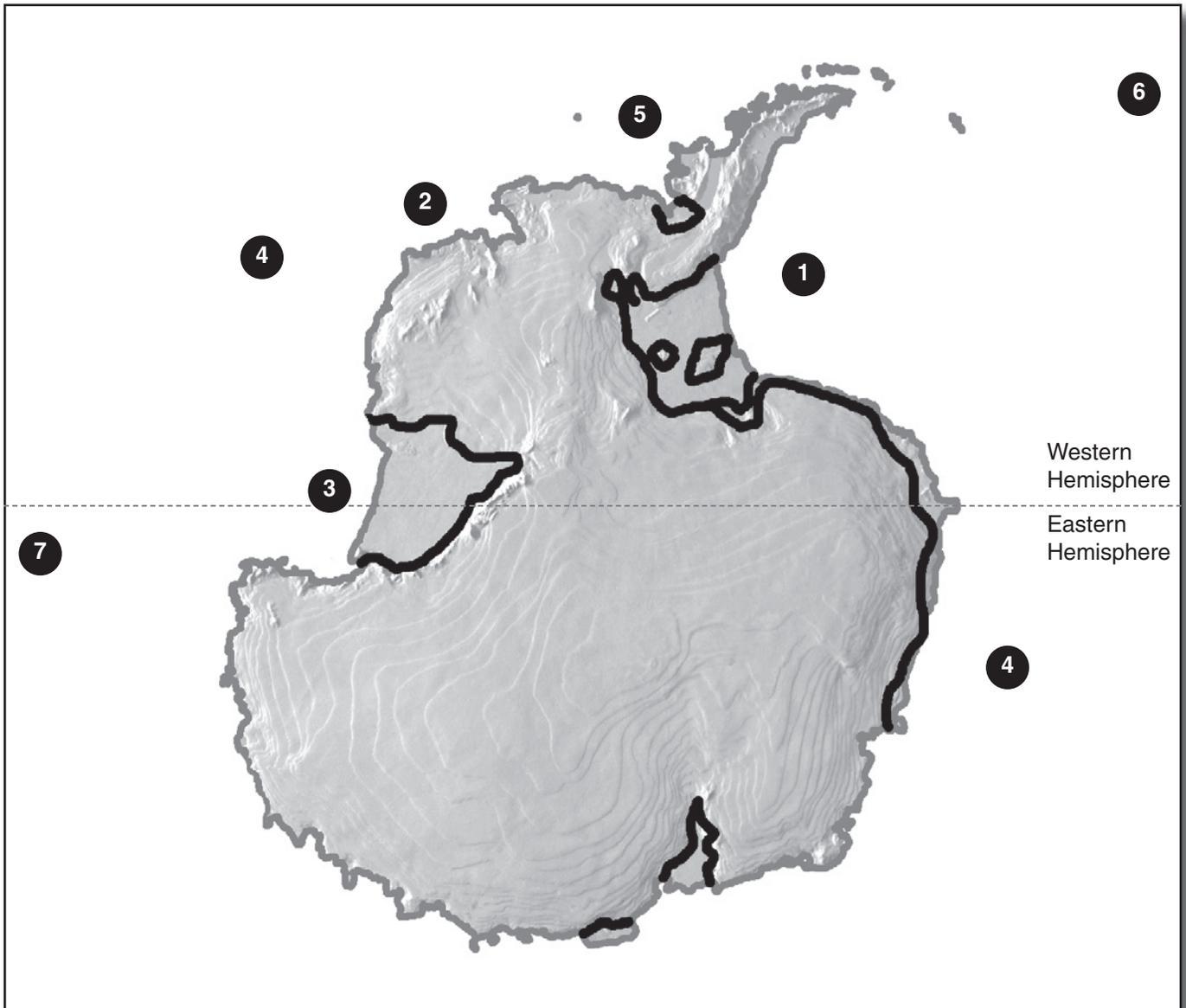
_____ Bellingshausen Sea

_____ Amundsen Sea

_____ Pacific Ocean

_____ Ross Sea

Antarctica's Oceans and Seas



Answer Keys

The Continents

Knowledge Check (p. 4)

Matching

1. c 2. d 3. e 4. a 5. b

Multiple Choice

6. b 7. a

Constructed Response

The earth's crust consists of 20 plates. Plate tectonics suggest that these plates move a few inches each year. Over time the plates have moved to their present positions.

Map Follow Up (p. 5)

- | | |
|-------------------|------------------|
| 1. North America | 2. South America |
| 3. Europe | 4. Africa |
| 5. Antarctica | 6. Asia |
| 7. Australia | 8. Arctic Ocean |
| 9. Atlantic Ocean | 10. Indian Ocean |
| 11. Pacific Ocean | |

The Continent of Antarctica

Knowledge Check (p. 9)

Matching

1. c 2. a 3. e 4. b 5. d

Multiple Choice

6. b 7. c

Constructed Response

An iceberg is smaller than an ice shelf. An iceberg is a floating piece of ice that is not connected to anything else. An ice shelf is still attached to land. Actually, the ice that breaks off the ice shelf is considered an iceberg.

Map Follow Up (p. 10)

- | | |
|------------------------|-----------------------|
| 1. Antarctic Peninsula | 2. Western Antarctica |
| 3. South Pole | 4. Eastern Antarctica |
| 5. Ross Ice Shelf | 6. Ronne Ice Shelf |

Map Follow Up (p. 11)

- | | |
|-----------------------|-------------------|
| 1. Weddell Sea | 2. Amundsen Sea |
| 3. Ross Sea | 4. Southern Ocean |
| 5. Bellingshausen Sea | 6. Atlantic Ocean |
| 7. Pacific Ocean | |

Antarctica's Climate

Knowledge Check (p. 14)

Matching

1. a 2. e 3. d 4. b 5. c

Multiple Choice

6. a 7. d

Constructed Response

The ozone layer protects the earth from harmful ultraviolet radiation. Scientists fear that the additional radiation will change Antarctica's ecological system and may affect the food chain of the continent's fish and other marine life.

Antarctica's Ice

Knowledge Check (p. 16)

Matching

1. c 2. e 3. a 4. b 5. d

Multiple Choice

6. b 7. c

Constructed Response

The Lambert Glacier is the largest glacier. It is 248 miles long. The Shirase is the fastest-moving glacier. It travels just over one mile per year.

Map Follow Up (p. 17)

- | | |
|-----------------------------|---------------------|
| 1. Antarctic Peninsula | 2. Larsen Ice Shelf |
| 3. Ronne-Filchner Ice Shelf | 4. Ross Ice Shelf |
| 5. West Ice Shelf | 6. Amery Ice Shelf |

Antarctica's Plant and Animal Life

Knowledge Check (p. 20)

Matching

1. d 2. e 3. b 4. a 5. c

Multiple Choice

6. b 7. c

Constructed Response

Krill is important in the diet of the rest of the animal life in the region. Antarctica's fish, birds, seals, and whales all feed on krill. It is often considered to be Antarctica's major resource to the rest of the world.

Early Exploration of Antarctica

Knowledge Check (p. 23)

Matching

1. d 2. c 3. a 4. e 5. b

Multiple Choice

6. d 7. b

Constructed Response

Aristotle and Ptolemy both believed that there was a huge unknown land in the Southern Hemisphere. Aristotle named it *Antarktikos*, and Ptolemy named it *Terra Australis Incognita*.

The Race to the South Pole

Knowledge Check (p. 26)

Matching

1. e 2. c 3. a 4. b 5. d

Multiple Choice

6. a 7. a

Constructed Response

Answers will vary. More than likely, Amundsen wished him the best of luck based on the letter he left for him.