AS BIG AS ANTARCTICA

GRADE LEVEL 2-3

Photo: BBC NHU

AS BIG AS ANTARCTICA

GRADE LEVEL 2-3
60 minute Lesson

Standards (NGSS):

2-ESS2-2 Earth's Systems

Develop a model to represent the shapes and kinds of land and bodies of water in an area.

From the Film:

In the film, ***Antarctica***, we learn that Antarctica is one and a half times the size of the United States and slightly over one and a half times the size of Europe. We also learn that Antarctica is a continent that holds 90% of the Earth's ice. Much like other land masses, Antarctica has a unique shape and physical features that sets it apart from other continents. In addition to being surrounded and sustained by the sea, it also has bays, mountains, and coasts.

Lesson Overview:

The class will be divided into groups of four students, with each group being responsible for creating a textured, topographic map of Antarctica. Using a provided outline of the landmass divided into 4 sections, students will label the different areas of the land mass and use various art materials to add texture and detail to their maps. When they have completed their maps, the four sections will be reassembled into one complete map of Antarctica.

Materials:

- Blue construction paper
- Outline of four parts of Antarctica, I, II, III, IV handouts - pp. 22-25
- Continent matching sheet, handout - p. 26
- Assortment of white, gray, and light blue project materials. May include:

  Yarn, paper, lace, tissue paper, crepe paper, napkins, tissues, masking tape, white or silver ribbon, markers, scissor, glue sticks or glue

- Clip from ***Antarctica*** of Globe for reference:

CLICK HERE for video

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EDUCATOR PREP:

Print map and a set of four sections of the Antarctica map for each group in the class. Gather a variety of art supplies for each group.

EDUCATOR GUIDE:

1. In the film, ***Antarctica***, we learned that Antarctica is about one and a half times the size of the United States and slightly over one and a half times the size of Europe. But more importantly, we also saw that Antarctica is not just a vast range of ice, but a continent with different features and topographies.

2. Ask students in groups of three to name as many of the seven continents as they can: Asia, Africa, Antarctica, and Australia, Europe, North America, and South America. After a couple of minutes, bring the whole group together and have them collectively create a list of the seven continents. Write these on the board or chart paper.

3. Inform students that even though these landmasses are all continents, they are different in size and features. First, we are going to take a quick look at the size of these continents and compare them. Use the following questions to define a continent:

What is a continent?

Answers may include that continents are large pieces of land surrounded by water. The seven continents make up 99% of the land that is on planet earth.

Why are they different sizes and shapes?

Answers may vary depending on the background knowledge of the students. Let students know that millions of years ago, all of the continents were actually connected and were one huge continent. Scientists call this continent Pangaea. Over time, the continents separated to become seven different land masses.

4. Pass out the continent matching sheets. Ask students to talk with their elbow partner and work together to match each continent to its correct size. Project or display a map of the globe that students can reference as they consider which continents correspond with

The distinctive characteristic of a topographic map is the use of elevation contour lines to show the shape of the Earth's surface.

Photo: Shutterstock / Pongpinun Traisrisilp

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which size.

5. Circulate and get a sense of how students are conceptualizing which continent is bigger or smaller and trying to match sizes.

Note: The goal here is for them to talk through the logic of matching up area measurements with size. This can be done through comparing, ordering or another approach to conceptualize what the area numbers mean.

6. After about five to seven minutes, go over the answers, asking the following questions:

Were you surprised by how small or how big any of the continents were?

Students may be surprised by any number of things related to size and depending on how they have conceptualized visual maps and compared continents on a globe. As this is a quantitative exercise, some of their previous observations may be confirmed or challenged.

Which continents are closest to being as big as Antarctica?

Antarctica is bigger than Europe and Australia, close to South America and smaller than North America, Asia, and Africa. As a fun fact, share with students that Antarctica is also about 1.5 times bigger than the United States, which is about 10.1 million km², and part of North America.

7. Continents, like people and things, are not one dimensional. Inform students that we will work together to learn more about the continent of Antarctica and create a map to gain a better understanding of different features and inhabitants of Antarctica.

8. Divide the class evenly into groups of four and give each group a set of the four sections of Antarctica and the reference map.

9. Tell students that they will work together using the information on the Overview Map to create a three-dimensional map of the continent.

10. Have students look at the blue lines on the Overview Map and explain that these lines are contour maps. The closer the lines are, the steeper the slope. The farther apart they are, the flatter the land. The blue lines will be used to model Antarctica's landscape on their maps.

11. Using various paper types and glue sticks, students will begin to "mold" or "build" their topography for their particular section. Inform students that their area of the map might consist of mountain ranges and steep cliffs.

Educator Notes:

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12. Check in with groups and individual students to see how they are thinking about representing the variations in elevation on Antarctica. If they are having trouble getting started, give them some ideas on how they can fold, crumple, or layer different types of paper to add texture to their maps.

13. After about fifteen minutes, when student are feeling like they have made progress on their map sections, ask them to use a pen or marker to label three to five of the areas that are found in their section using the reference maps. This could include bodies of water, an ice shelf, a mountain range, a town or research station. Give them about five minutes to do this for their individual section.

14. Inform students that Earth is known as the Blue Planet because 70% of it is covered by water. We now need to place their map sections into their context in the South Seas before combining them into a complete map. Ask students to glue their section onto a blue piece of construction paper. Then they will use scissors to cut away construction paper to align with the flat sides of their sections.

15. Bring students together as a whole group and ask one student from each group to bring their section and tape it to the board. In this way, they can jigsaw their four sections together to create a complete map of Antarctica and attach them. Ask them to label three bodies of water around the continent.

16. In their notebook or journal, ask students to reflect on this experience of creating a model of Antarctica with their classmates using one or more of the following questions or prompts:

What are three things that you learned about Antarctica that you did not know before this activity?

Student responses will vary but should reflect some things that they learned during the lesson.

What are two questions that you have about Antarctica?

Student responses will vary but should reveal their thinking and curiosity about the continent of Antarctica.

What is one thing that you did today with a classmate today and how did it make you feel?

Student responses will vary, but should encourage awareness and labeling of different types of emotions that can emerge during a collaborative experience.

The film team spent 8 weeks on this German ice-breaker in search of the biggest aggregation of great whales that has ever been filmed.

Photo: © BBC

Overview Map

Directions: Notice the blue lines. These are contour lines. The closer together the lines are, the steeper the slope. The farther apart they are, the flatter the land. We are going to use these to model Antarctica's landscape on your map.

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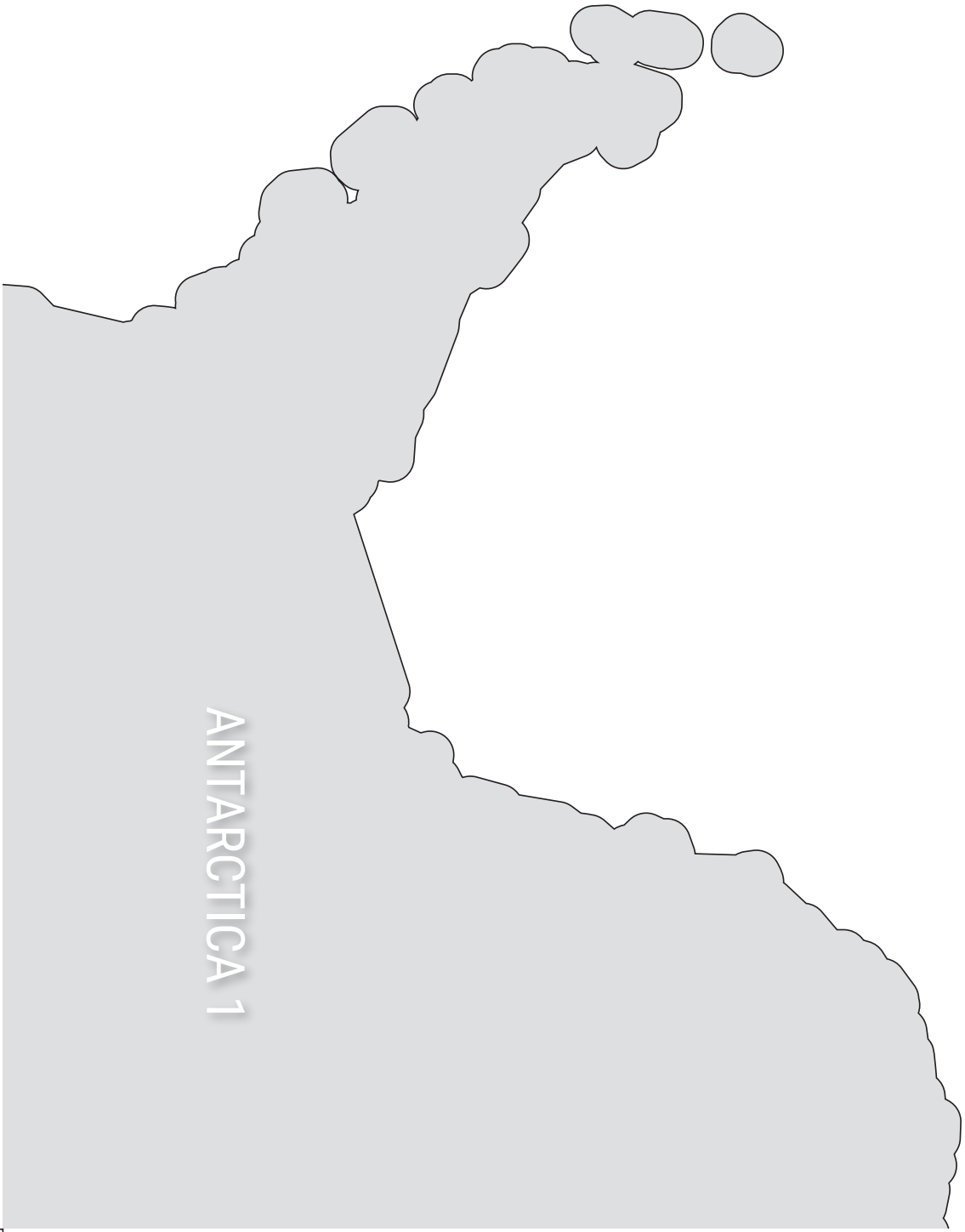
Map 1



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Map 2

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Map 3

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Map 4

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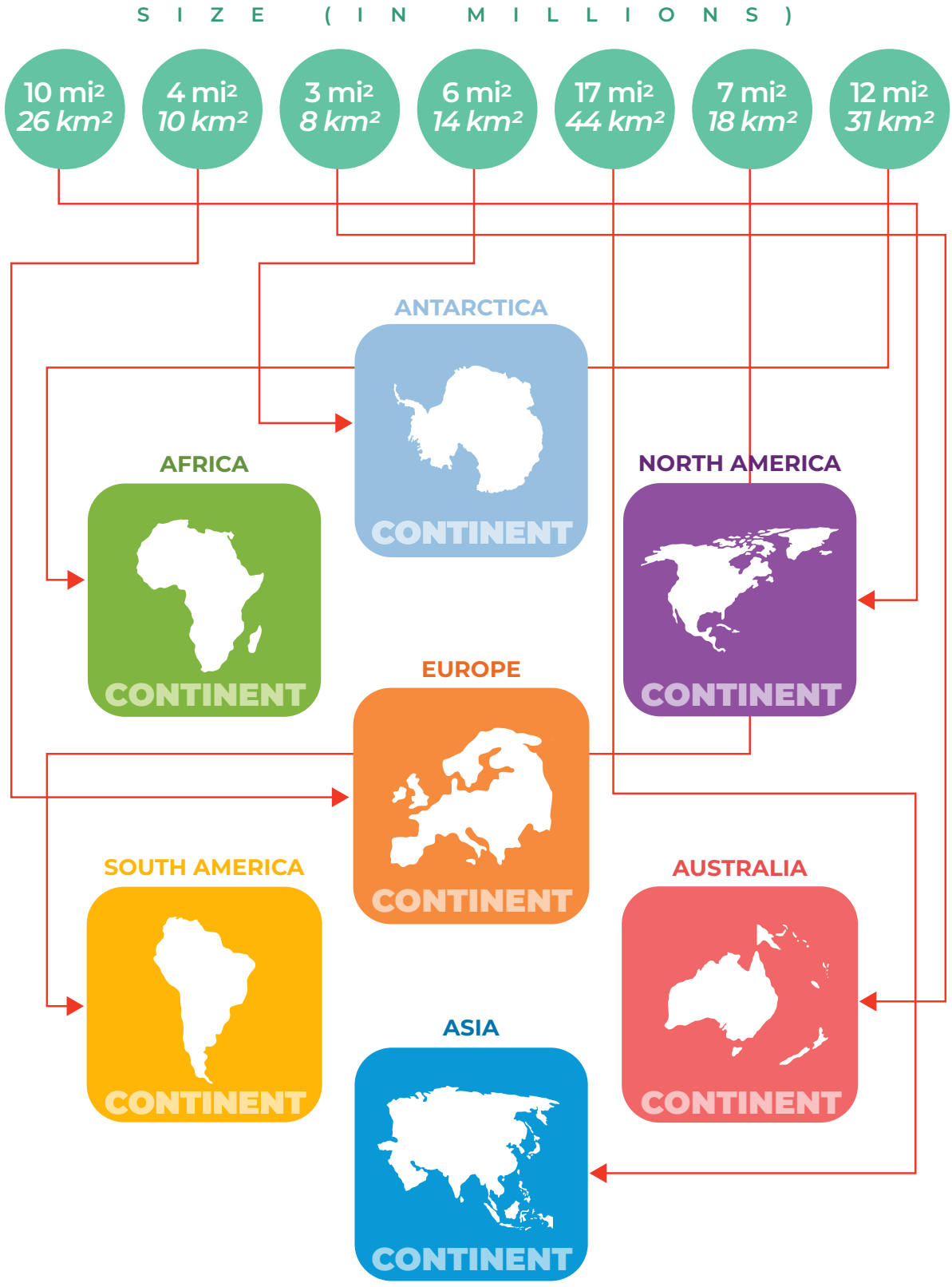
Match the continent to its size in millions of km² or mi²

SIZE (IN MILLIONS)

10 mi² *26 km²*	4 mi² *10 km²*	3 mi² *8 km²*	6 mi² *14 km²*	17 mi² *44 km²*	7 mi² *18 km²*	12 mi² *31 km²*

Match the continent to its size in millions of km² or mi²



Educator Key