Geographic Educators of Nebraska
Advocating geographic education for all Nebraskans

Perimeter and Area in Nebraska

Perimeter and Area in Nebraska uses the geography of the state and map skills to provide opportunities to apply real-life measurement problem-solving.

Students will apply the formulas for perimeter and area using the map scale to calculate the desired measures for counties in Nebraska.

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Grade Level	4 – 5
Class Period(s)	1 (40 – 50 min.)

Nebraska Social Studies Standards	Nebraska Science Standards	Nebraska Language Arts Standards	Nebraska Math Standards
SS 4.3.1 Students will explore where (spatial) and why people, places and environments are organized in the state. SS 4.3.1.a Read local and state maps and atlases to locate physical and human features in Nebraska. SS 4.3.1.b Apply map skills to analyze physical/political maps of the state. SS 4.3.1.d Differentiate between cities, states, countries, and continents.			**MA 4.3.3 Measurement: Students will perform and compare measurements and apply formulas.** MA 4.3.3.a Apply perimeter and area formulas for rectangles. MA 4.3.3.b Identify and use the appropriate tools, operations, and units of measurement, both customary and metric, to solve real-world problems involving time, length, weight, mass, capacity, and volume.

MA 4.1.2 Operations: Students will demonstrate the meaning of addition and subtraction of whole numbers and fractions and compute accurately.

MA 4.1.2.h Determine the reasonableness of whole number products and quotients in real-life problems using estimation, compatible numbers, mental computations, or other strategies.

Overview

Perimeter and Area in Nebraska uses the geography of the state and the map scale to provide opportunities to apply real-life measurement problem-solving scenarios related to perimeter and area.

Purpose

In this lesson students will use the map scale to apply the formulas for perimeter and area in order determine an approximate measurement.

Key Vocabulary

Perimeter – the measurement of the distance around a figure.

Area – The measurement of the interior region of a two-dimensional figure.

Scale – "…the relationship between the distances on the map and the actual distances on Earth." A bar scale is "…a horizontal line marked off in miles, kilometers, or some other unit measuring of distance." (nationalgeographic.org/encyclopedia/map)

Materials

- Big Nebraska Map
- Small Nebraska Map
- Measurement Tool (such as a meter stick, ruler or large pieces of paper aligned to the map scale)
- Teacher Activity Guide/Answer Key
- Student Activity Guide
- Grade 5 Reference Sheet

Objectives

The student will be able to:

Apply the formulas for perimeter and area to determine an approximate measurement.

Procedures

1. To begin the lesson, review the difference between perimeter & area.

2. Divide the students into groups of two and have the students join you at the Big Nebraska Map with a pencil, student activity guide, small Nebraska Map, and a book to serve as a writing surface. See *Teacher Activity Guide* for more information.

3. Demonstrate to students how to use the selected measuring tool and the map scale provided on the map to make approximate measures of Nebraska counties.

4. Provide students with an opportuniy to practice with a partner measuring using the map scale tool.

5. After students have had an opportunity to practice, student groups should work through the *Student Activity Guide*. Student groups will start on different numbers and work in numerical order through the Student Activity Guide.

6. When all student groups have completed the *Student Activity Guide*, refer to the lesson reflection questions for a post-activity discussion.

Assessment

An answer key has been provided and accompanies the *Teacher Activity Guide*. There are 10 measurement challenges presented to the students. Once the students have completed all 10 challenges,

use your classroom/district grading scale to assign the appropriate grade for the students.

Extensions

Students may research and measure more counties in Nebraska and identify the largest and smallest counties in terms of perimeter/area.

Sources

Nebraska Dept. of Education Grade 5 NeSA Math Reference Sheet

https://opportunity.nebraska.gov/files/research/stathand/asect1.htm

https://www.census.gov/quickfacts/fact/table/US/PST045217

nationalgeographic.org/encyclopedia/map

Perimeter & Area in Nebraska
Teacher Activity Guide

Lesson Procedures:

1. To begin the lesson, review the difference between perimeter & area.
   • **Perimeter** is the measurement of the distance around a figure**.** Think of
     walking around a fenced-in yard. In order to find perimeter, we need to
     add all sides of the object together. For example, if a rectangle has sides
     of 4 ft., 8 ft., 4 ft., and 8 ft. the perimeter would equal 24 ft.

   •**Area** is the measurement of the interior region of a two-dimensional
     figure. Think of walking around a fenced-in yard and needing to measure all of the
     grass inside (area) of the fence. In order to find the area of a
     rectangle, we multiply length times width and a square is side times side. For example,
     if a rectangle has one side measuring 4 ft. and one side measuring 8 ft., the area would
     equal 32 square feet.

2. Divide the students into groups of two and have the students join you at the Big
   Nebraska Map with a pencil, student activity guide, small Nebraska Map, and a book to
   serve as a writing surface. *The small Nebraska Map can be copied onto the back of the
   Student Activity Guide prior to the lesson.* Remind students that writing needs to be
   done off of the map.

3. Demonstrate to students how to use the selected measuring tool and the
   map scale provided on the map to make approximate measures of
   Nebraska counties. *The tool can be a ruler or sheet of paper aligned
   with the map scale.*

   • Use York County as a demonstration with the students. The
     approximate perimeter of York County is 100 miles, and the
     approximate area is 600 square miles

4. Provide students with an opportunity to practice with a partner measuring
   using the map scale tool.

5. After students have had an opportunity to practice, student groups should
   work through the Student Activity Guide. Student groups will start on
   different numbers and work in numerical order through the Student Activity
   Guide.

6. When all student groups have completed the **Student Activity Guide**, refer to the
following lesson reflection questions for a post-activity discussion.
   • What were three surprises during this activity?

   • What were areas of struggle for you and your partner?
   • Based on the activity, what question could you ask your
     classmates?

7. Additional discussion question:
Why do you think some counties vary greatly in size? Consider their location and physical geography.

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KEY-Approximate measurements in miles (Perimeter) and sq. miles (Area)

1. Cherry County
        Perimeter: _____307 mi._____   Area:_6000-6009 sq. mi_____

2. Banner County
        Perimeter: _____112 mi._____   Area: 715-746 sq. mi._____

3. Chase County
        Perimeter: _____120 mi._____   Area: 898-900 sq. mi.____

4. Buffalo County
        Perimeter: _____122 mi._____   Area: 950-975 sq. mi.   __ __

5. Dundy County
        Perimeter: _____120 mi._____   Area: 921 sq. mi._____

6. Cheyenne County
        Perimeter: _____142 mi._____   Area: 1197-1200 sq. mi.___

7. Custer County
        Perimeter: _____202 mi._____   Area: 2544-2576 sq. mi.___

8. Thayer County
        Perimeter: _____95 mi._____   Area: 575-578 sq. mi._____

9. Pawnee County
        Perimeter: _____83 mi._____   Area: 432-433 sq. mi._____

10. Antelope County
        Perimeter: _____120 mi._____   Area: 858-864 sq. mi.____

Note to Teachers: The measurements above are based on GIS online mapping, https://opportunity.nebraska.gov/files/research/stathand/asect1.htm and/or https://www.census.gov/quickfacts/fact/table/US/PST045217 where available. Students should round their measurements based on your instructions (probably to the nearest ten or hundred).

NeSA-M Grade 5 Reference Sheet			**NeSA**	

Shape	Area	Perimeter	Key	
Rectangle	$A = l \times w$	$P = 2l + 2w$	l = length	s = side length
Square	$A = s \times s$	$P = s + s + s + s$	w = width	

Perimeter & Area in Nebraska

Student Activity Guide

Group Members: _____

Using the provided map scale and measurement tool, find the approximate perimeter and area of the selected counties in Nebraska. If you need help, be sure to use the Grade 5 Reference Sheet. It has the formulas for perimeter and area. We will use **miles** and **square miles** as our units of measure.

1. Cherry County
      Perimeter: _____   Area: _____

2. Banner County
      Perimeter: _____   Area: _____

3. Chase County
      Perimeter: _____   Area: _____

4. Buffalo County
      Perimeter: _____   Area: _____

5. Dundy County
      Perimeter: _____   Area: _____

6. Cheyenne County
      Perimeter: _____   Area: _____

7. Custer County
      Perimeter: _____   Area: _____

8. Thayer County
      Perimeter: _____   Area: _____

9. Pawnee County
      Perimeter: _____   Area: _____

10. Antelope County
      Perimeter: _____   Area: _____

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Dr. Randy Bertolas, Coordinator

NATIONAL GEOGRAPHIC
Education Foundation

Cartography by
Dr. Randy Bertolas
Dr. Leal Rawlings
Wayne State College

Wyoming

Colorado

Kansas

South Dakota

Iowa

Sand Hills

100th Meridian

NORTH

0   15   30   60   90   120

Miles