Geographic Educators of Nebraska

Advocating geographic education for all Nebraskans

Measuring Nebraska

Students will use the scale bar on different maps to measure distance between cities and between sites.

Author	Karen Graff, Ed. D.
Grade Level	4th
Class Period(s)	1 (40 – 50 minutes)

Nebraska Social Studies Standards	Nebraska Science Standards	Nebraska Language Arts Standards	Nebraska Math Standards
SS 4.3.1 Explore where (spatial) and why people, places, and environments are organized in the state and around the world. SS 4.3.1.a Use 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.			**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.a Add and subtract multi-digit numbers using the standard algorithm.

Overview

Students will develop an understanding of scale and use paper and pencil to measure distance using a scale bar.

Purpose

Students will learn how to interpret a map's scale and use one method of determining distance between two locations.

Key Vocabulary

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."

Source: nationalgeographic.org/encyclopedia/map

Materials

- *Student Atlas of Nebraska* (1 copy for each student)
- Narrow strips of paper for marking distances (plain copy paper cut into 1" strips)
- Measuring Nebraska Practice Sheet

Objectives

The student will be able to:

- Use a scale bar to measure distance on a map.

Procedures

1. Introduce and explain the vocabulary word "scale." Students are likely to suggest other meanings such as an instrument to measure weight or the body covering of a fish or reptile. If items are drawn *to scale* they are proportionate on paper as they are in real life. (If you draw a picture of yourself standing next to your house, the house should be much taller and larger than you as it is in real life. It may help students understand if you draw such a picture that is NOT to scale.)

2. Refer to page 6 "Measuring Nebraska" and the scale bar. Students should note that the first mark after 0 is 25 miles, which means the unlabeled mark is 50 + 25 =75 miles. Often a scale bar will indicate a scale such as 1 inch = 100 miles. It is important to read the scale bar because maps differ in scale.

3. Tell students to page through the Atlas and look for other maps that have scale bars. (Maps on pages 16, 19, 21, 23, 24, and 43/47 have scale bars.) Which map has a scale that is different from the others? (Page 19 "Expeditions" has a scale with intervals of 15 miles.) What is the distance for the unlabeled mark on this scale bar? (30 + 15 = 45 miles)
If you have a US wall map in your classroom or in a social studies text, ask students to look at the scale for a map of the 48 contiguous states to see its range and the intervals. Then have them look at inset maps for Alaska and Hawaii. They should notice that the scales for those two states are different. They are not drawn in proportion to the 48 contiguous states. Alaska is about twice the size of Texas. Does it look like it on your US map? (Alaska is drawn to a different scale so it fits on the same map. It probably appears to be about the same size as Texas.)

4. Demonstrate how to use the scale bar on page 6 "Measuring Nebraska". It is often easiest for students to use a narrow strip of paper to mark and measure. How can you measure distances that are longer than 100 miles since you will "run out of scale?" Show students how to place the end of the paper strip at one end of the green line and make a mark on the paper where the line ends. Then place the marked strip on the scale with the end at 0. Make a mark at 100, slide that mark back to 0, mark again at 100, and so on until you have measured the entire length of the green line. Total the numbers, estimating if the final mark falls within the scale intervals. Caution students against trying to estimate too precisely. It isn't possible to find exact distances with such a method so we wouldn't expect to find 79 miles or 156 miles, for example. Use your judgment if students should estimate to the nearest 5 or 10 miles. Demonstrate the procedure again with the red and blue lines.

5. Continue guided practice with the "Cities and Villages" map on page 47. Why is measuring distance directly between two points not completely realistic? (Students may have heard "the shortest distance between two points is a straight line" or "as the crow flies." We are not really measuring ground travel. Roads do not connect locations in a straight line because of landforms, bodies of water, and man-made structures. But for travel in a vehicle, it probably doesn't matter if the actual distance is 69 miles or 73 miles.)

6. Assign the Measuring Nebraska Practice sheet for independent practice.

Assessment

Use other maps on pages 16 and 23 with the same scale to measure distances. A short assessment for "Frontier Forts" (page 23) is provided.

Extensions

1. Use maps on pages 21 and 24 to measure trails and railroads. Lay string or yarn along the routes and cut it at the end. Then place the cut length of string on the scale to measure the distance (similar to the procedure with the paper strips). In this case, it may be easier for students to actually cut the string into lengths of 100 miles and total the lengths.

2. The "Expeditions" map on page 19 has a different scale and winding routes. Present this as a challenge to students.

3. Show students how to use the Nebraska Mileage Chart to find more exact mileage. Have them compare their mileage estimates to the distance on the table.

Sources

nationalgeographic.org/encyclopedia/map

Support for these lessons was provided by:
Geographic Educators of Nebraska
(GEON) a member of the National
Geographic Geography Alliances
and
Nebraska Department of Education
(NDE) Social Studies Department