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.

<table>
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<th>Author</th>
<th>Karen Graff</th>
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<tr>
<td>Grade Level</td>
<td>4th</td>
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<td>Class Period(s)</td>
<td>1 (40 – 50 minutes)</td>
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Nebraska Social Studies 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.

Nebraska Science Standards

Nebraska Language Arts Standards

Nebraska Math Standards
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

(Where there are 2 page numbers, the second is for the 2nd edition of the Atlas.)

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 43/47. 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

[link to 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
Measuring Nebraska

Measure the distance between these locations and record the estimated distance in miles. Remember to measure from “dot to dot” on the map.

1. North Platte to McCook __________________miles

2. Alliance to Scottsbluff __________________miles

3. Hastings to Beatrice __________________miles

4. Broken Bow to Holdrege __________________miles

5. Imperial to Ogallala __________________miles

6. Valentine to Ainsworth __________________miles

7. Norfolk to Wayne __________________miles

8. Auburn to Falls City __________________miles

9. Fairbury to Westpoint __________________miles

10. Cozad to South Sioux City __________________miles
Measuring Nebraska-KEY

Measure the distance between these locations and record the estimated distance in miles. Remember to measure from “dot to dot” on the map.

1. North Platte to McCook ________ 65__(68)______miles*

2. Alliance to Scottsbluff ________50__(53)______miles*

3. Hastings to Beatrice ________90__(107)______miles*

4. Broken Bow to Holdrege ________75____________miles

5. Imperial to Ogallala ________50____________miles

6. Valentine to Ainsworth ________40____________miles

7. Norfolk to Wayne ________25__(31)______miles*

8. Auburn to Falls City ________25____________miles

9. Fairbury to Westpoint ________125____________miles

10. Cozad to South Sioux City ________215____________miles

*Numbers in ( ) are from the Nebraska Mileage Chart. Note the discrepancy in #3.
Measuring Nebraska “Frontier Forts” Page 23

Measure the distance between these historic U.S. Military Forts and record the estimated distance in miles. Measure from the center of one star symbol to center of the next star symbol on the map.

1. Old Fort Kearny to Fort Kearny
   _______160__________miles

2. Fort Sidney to Fort Mitchell
   _______65___________miles

3. Fort Hartsuff to Fort McPherson
   _______85___________miles

4. Fort Crook to Fort Omaha
   _______15___________miles

5. Fort Robinson to Fort Niobrara
   _______145___________miles
Name____________________________________________

Measuring Nebraska “Frontier Forts” Page 23

Measure the distance between these historic U.S. Military Forts and record the estimated distance in miles. Measure from the center of one star symbol to center of the next star symbol on the map.

1. Old Fort Kearny to Fort Kearny

___________________________miles

2. Fort Sidney to Fort Mitchell

___________________________miles

3. Fort Hartsuff to Fort McPherson

___________________________miles

4. Fort Crook to Fort Omaha

___________________________miles

5. Fort Robinson to Fort Niobrara

___________________________miles
### NEBRASKA MILEAGE CHART

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Please Drive Carefully