Measuring Nebraska

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

<table>
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<tr>
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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

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
# NEBRASKA MILEAGE CHART

| Alliance  | Beatrice | Bellevue | Blair | Chadron | Columbus | Falls City | Fremont | Gering | Grand Island | Holdrege | Kearney | Kimball | Lincoln | McCook | Nebraska City | North Platte | Ogallala | Omaha | Parnell | Plattsmouth | Seward | Sidney | So. Sioux City | Valentine | Wayne | York |
|-----------|----------|----------|-------|---------|----------|-----------|---------|--------|-----------|----------|---------|---------|---------|--------|--------|---------------|-------------|---------|-------|---------|-----------|--------|--------|--------------|-----------|--------|-------|

Please Drive Carefully
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
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**

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