

Nebraska's Lines of Symmetry

Nebraska's Lines of Symmetry provides students the opportunity to explore the state of Nebraska and identify lines of symmetry throughout the state.

Students will locate and draw lines of symmetry based on a map of Nebraska.

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

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.
SS 4.3.1.d Differentiate between cities, states, countries, and continents.

Nebraska Science Standards

Nebraska Language Arts Standards

Nebraska Math Standards

MA 4.3.1
Characteristics:
Students will apply and describe geometric characteristics and create two and three - dimensional shapes.
MA 4.3.1.h
Recognize and draw lines of symmetry in two-dimensional shapes.
OPTIONAL:
MA 4.3.1.c Identify and draw points, lines, line segments, rays, angles, parallel lines, perpendicular lines, and intersecting lines, and recognize them in two-dimensional figures.
MA 4.3.1.d Classify two-dimensional shapes based on the presence or absence of parallel and perpendicular lines, or the presence or absence of specific angles.

Overview

Nebraska's Lines of Symmetry provides students an opportunity to explore the state of Nebraska and to identify and draw lines of symmetry. The students will explore the counties of Nebraska in this activity.

Purpose

In this lesson students will practice identifying symmetry with the use of the Big Nebraska Map.

Key Vocabulary

Line of Symmetry – A line that divides a figure into two congruent halves that are mirror images of each other.

Materials

- Big Nebraska Map
- Blue Rope (1 piece per group)
- Teacher Activity Guide/Answer Key
- Student Activity Guide (Small Nebraska Map printed on back)

Objectives

The student will be able to:

1. Describe a line of symmetry.
2. Apply knowledge of symmetry by drawing lines of symmetry of Nebraska counties on a map.

Procedures

1. Review Symmetry and Lines of Symmetry with the students. For examples of review, please refer to the **Teacher Activity Guide**.
2. Have the students join you around the Big Nebraska Map. Students should have the following supplies for the activity: 1 piece of blue rope (per group), a pencil, a book to be used as a writing surface, and the student activity guide.

3. Divide the students into groups of 2. The students will work together in learning teams to complete the lesson.

4. Students will work through the **Student Activity Guide** and complete Nebraska's Lines of Symmetry.

5. At the conclusion of the lesson, please refer to the lesson reflection questions located on the **Teacher Activity Guide**.

Assessment

This lesson is designed as a formative assessment to check the student understanding of lines of symmetry. In addition, the reflection questions at the conclusion of the lesson can be used to gather further data relating to the understanding of the topic.

Extensions

1. Lines of Symmetry in the United States. Students can analyze the shapes of the other states in the United States and identify the number of lines of symmetry per state (not by county in each state).
2. Parallel and perpendicular lines-Have students identify these types of lines on the counties' borders. (Math standards-MA 4.3.1.c, MA 4.3.1.d)

Sources

Line of Symmetry Definition provided by NDE Math Glossary (www.education.ne.gov)

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's Lines of Symmetry

Teacher Activity Guide/Answer Key

Lesson Procedure:

1. Review Symmetry and Lines of Symmetry with the students.

- A **Line of Symmetry** is a line that divides a figure into two congruent halves that are mirror images of each other.
- Discuss with students the concept of symmetry and lines of symmetry of the following objects.



2. Have the students join you around the Big Nebraska Map. Students should have the following supplies for the activity: 1 piece of blue rope (per group), a pencil, a book to be used as a writing surface, and the student activity guide. (When students are writing, please have them step off of the map.)

3. Divide the students into groups of 2. The students will work together in learning teams to complete the lesson.

4. Students will work through the ***Student Activity Guide*** and complete Nebraska's Lines of Symmetry. Start each student group on a different number and have the student groups work in numerical order. Having the student groups start at different locations will allow for more room for investigation.

5. At the conclusion of the lesson, please refer to the following lesson reflection questions.

- How can you describe symmetry and lines of symmetry in your own words?
- What surprised you about lines of symmetry in Nebraska and its counties?
- Thinking about today's lesson, what is one thing another group of students might not understand?
- One question I have after the activity is...

6. Additional discussion questions:

- Why do you think some counties have straight boundaries while others don't? Give examples of counties that have different types of boundaries.
- Look at the shape of Nebraska. How are its boundaries like those of some of its counties?
- Look at a map of the United States to see the same situation with the other 49 states. Give examples of each.

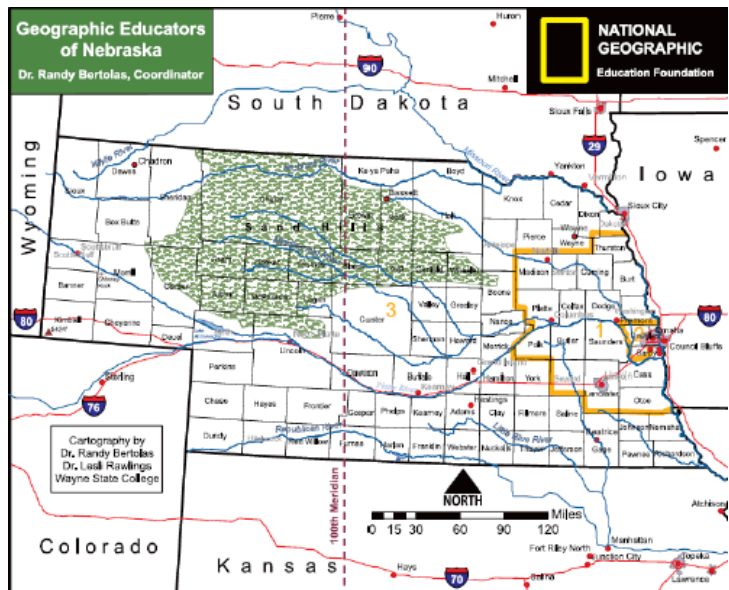
Nebraska's Lines of Symmetry Teacher Activity Guide/Answer Key

Group Members: _____

In this lesson students will practice identifying lines of symmetry with the use of the Big Nebraska Map. Using your group's blue rope, identify the lines of symmetry of the following locations in the state of Nebraska on the BIG NEBRASKA MAP.

1. Nebraska - **None**
2. Cherry County - **None**
3. Harlan County - **4**
4. Webster County - **4**
5. Sioux County - **None**
6. Knox County - **None**
7. Cuming County - **4**
8. Perkins County - **2**
9. Banner County - **2**
10. Thurston County - **None**
11. Otoe County - **None**
12. Madison County - **4**
13. York County - **4**
14. Lancaster County - **None**
15. Box Butte County - **None**

Draw the lines of symmetry your group identified on the map of Nebraska provided on the back of this page!

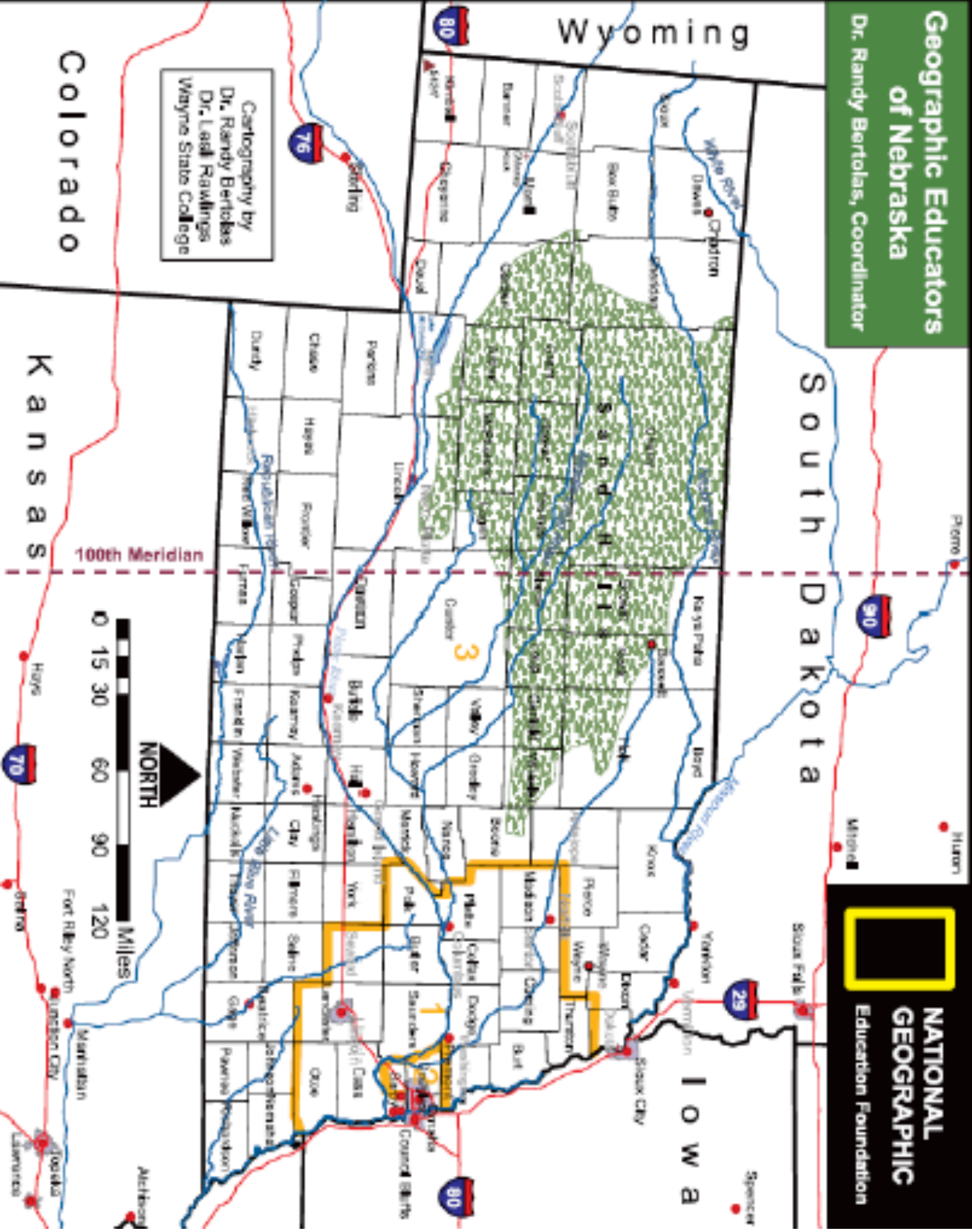


Geographic Educators of Nebraska

Dr. Randy Bertolas, Coordinator



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Wayne State College



Colorado

Kansas

Wyoming

South Dakota

Iowa



Nebraska's Lines of Symmetry

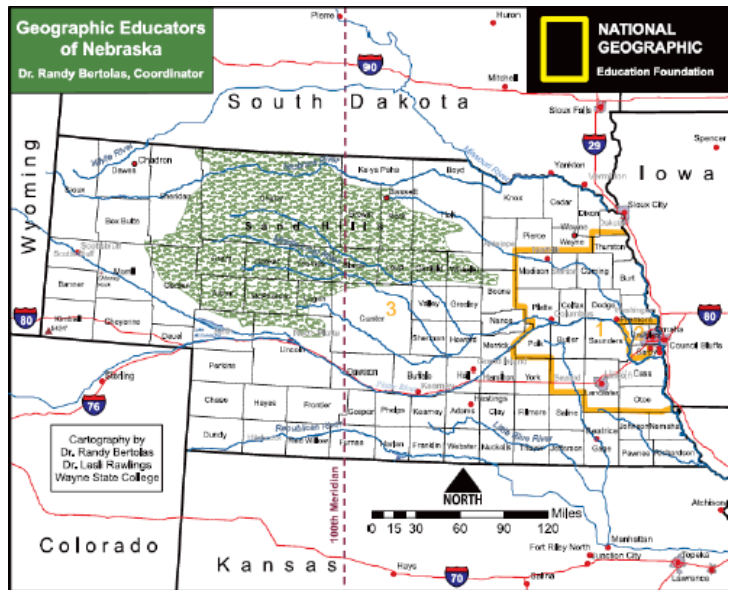
Student Activity Guide

Group Members: _____

Using your group's blue rope, identify the lines of symmetry of the following locations in the state of Nebraska on the BIG NEBRASKA MAP.

1. Nebraska =
2. Cherry County =
3. Harlan County =
4. Webster County =
5. Sioux County =
6. Knox County =
7. Cuming County =
8. Perkins County =
9. Banner County =
10. Thurston County =
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12. Madison County =
13. York County =
14. Lancaster County =
15. Box Butte County =

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