

# Geographic Educators of Nebraska

Advocating geographic education for all Nebraskans

## It's All Downhill from Here: Tracing Nebraska's Rivers on a BIG Map

Students learn the major rivers of Nebraska. They will analyze the direction that these rivers flow, enabling them to state the reason Nebraska's rivers flow predominantly east/southeast.

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<b>Grade Level</b>	4
<b>Class Period(s)</b>	1-2 (depending on depth of discussion)

Adapted from: "Go with the Flow" from National Geographic Giant Traveling Maps

Nebraska Social Studies Standards	Nebraska Science Standards	Nebraska Language Arts Standards	Nebraska Math Standards
<p>4.3.1 Students will explore where (spatial) and why people, places and environments are organized in the state.</p> <ul style="list-style-type: none"><li>a. Read local and state maps and atlases to locate physical and human features in Nebraska.</li><li>b. Apply map skills to analyze physical/political maps of the state.</li><li>d. Analyze why things in Nebraska are located where they are in Nebraska.</li></ul> <p>4.3.2 Students will compare the characteristics of places and regions and their impact on human decisions.</p> <ul style="list-style-type: none"><li>b. Classify regions and places within the state of Nebraska using physical and human features.</li></ul>	<p>5.2.2 Students will integrate and communicate the information, concepts, principles, processes, theories, and models of the Physical Sciences to make connections with the natural and engineered world.</p> <ul style="list-style-type: none"><li>b. Identify the influence of forces on motion due to outside forces.</li></ul> <p>5.4.2 Students will integrate and communicate the information, concepts, principles, processes, theories, and models of Earth and Space Science to make connections with the natural and engineered world.</p> <ul style="list-style-type: none"><li>a. Observe and describe Earth's materials, structure, and processes to describe the characteristics of rocks, minerals,</li></ul>		

4.3.3

Students will identify natural processes in the physical world.

- a. Identify physical processes that shape Nebraska's features and patterns.
- b. Identify examples of ecosystems located in Nebraska.

4.3.5

Students will identify how humans have adapted to and modified different environments in Nebraska.

- b. Describe how humans have adapted to and modified Nebraska's physical environment.
- d. Describe environmental issues in Nebraska.
- e. Describe human adaptations to the physical environment.

4.3.6

Students will use geographic skills to make connections to issues and events.

- b. Identify questions that help explain the interrelationships of human or physical geographic characteristics of places.

soils, water, and the atmosphere.

- b. Identify weathering, erosion, and deposition as processes that build up or break down Earth's surface.

## Overview

This lesson allows students to identify elevations of specific locations across the state of Nebraska. Students then physically demonstrate the slope of the land across the state, giving them a very distinct picture of why Nebraska's rivers flow predominantly to the east/southeast.

## Purpose

In this lesson students will learn that the elevations of Nebraska are predominantly higher in the western part of the state causing the rivers to flow into the Missouri River Watershed.

## Key Vocabulary

elevation – height above sea level

sea level – the level of the surface of the sea with respect to the land

gravity – the force that attracts a body toward the center of the earth

tributaries – a river or stream flowing into a larger river

watershed – an area of land where all the water flows into a common area such as a river.

relief

## Materials

- blue ropes
- directional arrows
- elevation cards
- silver napkin rings
- cone
- poly dot
- small whisk brooms
- blue counting chips
- dustpans
- United States Map (posted on the wall)
- Optional – geologic map (s)

## Objectives

The student will be able to:

1. describe specific points of elevation in the state of Nebraska.
2. analyze the direction rivers flow across the state of Nebraska.
3. explain the reason for the direction that water flows across Nebraska.

## Procedures

Step 1: Using the elevation cards, students work individually or in pairs to find the elevations of several locations across Nebraska. Use the silver “napkin rings” to stand the cards on the map. A cone is to be placed at Nebraska's highest point above sea level. **In what county is Nebraska's highest point above sea level?** (Answer: Kimball County) A poly dot is to be placed at Nebraska's lowest point above sea level. **In what county is Nebraska's lowest point above sea level?** (Answer: Richardson County)

Step 2: Using the blue ropes, students from each group work carefully to trace each twist and turn of Nebraska's Missouri River, Platte River, Niobrara River and Republican River. Have them start at the source of the main trunk of each river.

Step 3: After all of the points of elevation and rivers have been identified, have students read the place names on their cards. Once students read their cards, give them the following directions: **Students with elevations higher than 3,500 feet above sea level will stand in place. Students with elevations between 2,000 – 3,500 feet above sea level will kneel. Students with elevations between 1,000 – 2,000 feet above sea level will sit, and students with a river card will lie down.** (Depending on the way you want the discussion to go, at this point you may want to discuss changes on Earth's surface such as erosion. This will help students understand how river valleys are created over time. You could also view a geologic map of Nebraska.)

Step 4: Ask...**Which direction are the rivers flowing? Why?** (Answer: The rivers are mainly flowing east. Remind students that due to **gravity**, water always flows downhill. Water that falls as precipitation seeps into the ground and slowly flows through rock layers below the surface, emerging into creeks nearby. These creeks flow into streams, then into larger and larger rivers and finally into the ocean.) Have students look at the four rivers they have just highlighted. Ask...**Do you see any smaller rivers flowing into a larger river?** Tell them that these are called **tributaries**. (During this discussion, you might also mention the vocabulary of river source and river mouth.) Point out that these major rivers are part of larger systems which contain thousands of smaller creeks and streams that do not appear on this map. Ask...**Why doesn't this map show all of these thousands of smaller creeks and streams?** Let students know that the map would be unreadable if it were covered with all of the smaller creeks and streams.

Step 5: Have students who are not standing, kneeling, sitting and laying on the map place the directional arrows beside the rivers to show the direction that the water is flowing. Ask students to return to the edges of the map. Begin discussing the term **watershed**.

A watershed is the area of land where all the water flows into a common area. The watershed acts like a funnel, collecting all the water within an area and channeling it into a waterway. Each watershed is separated from neighboring watersheds by a geographical barrier such as a ridge, hill or mountain. These barriers are called the drainage divide. Watersheds are also sometimes called drainage basins or catchments.

To help students visualize a watershed, ask them to imagine rain falling on the pointed roof of a house. The water has to flow down one side or the other. The same is true of rain or snow on the land – water flows down from the mountains creating streams and rivers.

Ask...

**Where is the major drainage divide located for the United States of America?** (Crest of the Rocky Mountains)

**Into what larger bodies of water do the major drainage basins empty?** (The Pacific Ocean and the Atlantic Ocean)

**Which ocean is located closest to the Rockies?** (The Pacific Ocean)

Because of the relief of the North American continent, rain that falls just east of the Rockies in Montana (only 800 miles from the Pacific Ocean) may flow via the Missouri-Mississippi Rivers to the Atlantic Ocean over 2,000 miles downstream!

Step 6: With the cone, elevation cards, ropes and arrows still on the map, give students a short amount of time to walk around the map and make note of the major drainage systems and elevations. When time is up, have each group retrieve the materials and return to the sides of the map.

## Assessment

Now, hand out a whisk broom to each group. Place blue counting chips on the map, explaining that they represent raindrops. Direct the students to use the whisk brooms to move the chips on the map as gravity would move rainfall within the watersheds. Instruct them to keep sweeping until the chips (or rain) have made their way to the Missouri River. Direct students to the United States map posted on the wall; ask them to trace the Missouri River until it reaches the Mississippi River. Keep tracing until it finally reaches the Gulf of Mexico which is part of the Atlantic Ocean.

## Extensions

Using a geologic map of Nebraska, discuss changes on Earth's surface over time. Discuss the formation of Nebraska's regions.

Using a blackline master of Nebraska and/or the United States, students could label the major rivers and identify the direction the water flows.

Add brown bingo chips to the blue chips to discuss erosion and sediment.

## Sources

City elevations -- USGS – Geographic Names Information System  
<http://geonames.usgs.gov/apex/f?p=gnispq>

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