Measuring Arizona

Students learn about map scale by comparing measurements on two Arizona maps.

Author
Carol Levine

Grade Level
4

Duration
1 class period

National Geography Standards
ELEMENT ONE: THE WORLD IN SPATIAL TERMS
1. How to use maps and other geographic representations, tools, and technologies to acquire, process, and report information from a spatial perspective.

Arizona Geography Strand
Concept 1 The World in Spatial Terms
GRADE 4
PO 1 Interpret political and physical maps using the following map elements:
b. compass rose
c. symbols
d. legend
e. scale
PO 7 Locate physical and human features using maps, illustrations, or images:
b. human (e.g., Phoenix, Yuma, Flagstaff, Tucson, Prescott)

Concept 2 Places and Regions
GRADE 4
PO 3 Locate the landform regions of Arizona (plateau, mountain, desert) on a map.

Arizona Math Standard
STRAND 4 Geometry and Measurement
CONCEPT 4 Measurement
PO 2 Apply measurement skills to measure length, mass, and capacity using metric units.

Overview
A map scale is a fraction comparing distance on a map to distance on the ground. For example, the map scale 1:1000 or 1/1000 indicates that for every 1cm (or inch or cubit) on the map, there are 1000 of these units of length on the ground. Understanding different map scales helps students place features in their world in perspective.

Purpose
In this lesson students will gain a better understanding of scale. The students will use relative locations to give an approximate location of places. The students will measure a distance of each city from Arizona borders and then divide those measurements and use the divided measurement to place cities in the relative location on a smaller map.

Materials
- Landforms Regions of Arizona maps (2 per page) and (4 per page)
- Overhead transparency of grid paper (one per group)
- String, ruler, or straight edge
- Paper, transparent tape, and pencil
- Measuring Arizona handout and Answer Key
Measuring Arizona

- Optional: rectangle cookie (4.25 by 5.5) unfrosted and unmarked
- If cookie is used: frosting for cookies, cookie decorations: sprinkles, jimmies

Objectives
The student will be able to:

1. Identify the landform regions of Arizona.
2. Measure the relative distance of the cities from the borders using transparent graph paper.
3. Identify the location of several cities in Arizona using a small-scale version of an Arizona map.
4. Identify directions on the map.

Procedures
1. Divide the class into groups of four students. Give students Landform Regions of Arizona (2 per page), a sheet of transparent graph paper, and the smaller version of the same map (4 per page) with the regions visible but the cities removed.
2. Have students measure the distance of each city from the state borders on the larger map. They must measure from the southern border going north and from the eastern border going west.
3. Have students tape the overhead transparency graph paper on the map between 109° and 31° in the lower right hand corner. They should use the study guide to enter the measurements and to reduce the measurement in half for the small version of the map.
4. Students should enter the location of the cities on the small map using the reduced measurements. (Evaluate both the study guide and the smaller Arizona model to see how well the students approximated the location of the cities.)
5. (Optional) Perform the preceding steps using a rectangular cookie (4.25 by 5.5). Give students frosting and an assortment of decorations to use on a cookie. Their first job will be to frost the rectangle in the shape of Arizona using the graph paper and Landforms Regions of Arizona Map as a guide. The next job for the students is to identify the landform regions. Students then use a map and a ruler or string to approximate the distance from border to cities. Use a decoration to identify the location. As stated above, use the information from the study guide to estimate the relative locations. (The students can then share their cookies in celebration of their lesson.)

Assessment
The assessment can be done in two parts.
1. The study guide with the distance measurements and the reduced scale measurements identifies the math calculations. Mastery is considered 80% or higher on the math calculations.
2. The teacher can evaluate the placement of the cities on the smaller map for an assessment of geography skill. Mastery is considered the correct placement of 10 cities or more.

Extensions
If time and facility allow, the students could prepare the dough for sugar cookies and thereby work with cooking measurements. The cookie could be used for the smaller map.