

Looking for Landmarks: Plotting Latitude/Longitude and Geometry Coordinates

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Grade Level 5 and 7
Duration 1-2 class periods

National Standards

GEOGRAPHY

Element 1: The World in Spatial Terms

1. How to use maps and other geographic representations, geospatial technologies, and spatial thinking to understand and communicate information

AZ Standards

MATHEMATICS

Geometry

5.G.A.1. Understand and describe a coordinate system as perpendicular number lines, called axes, that intersect at the origin (0,0). Identify a given point in the first quadrant of the coordinate plane using an ordered pair of numbers, called coordinates. Understand that the first number (x) indicates the distance traveled on the horizontal axis, and the second number (y) indicates the distance traveled on the vertical axis.

5.G.A.2 Represent real-world and mathematical problems by graphing points in the first quadrant of the coordinate plane and interpret coordinate values of points in the context of the situation.

Math Equations and Expressions

7.EE.B.3 Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form. Convert between forms as appropriate and assess the reasonableness of answers.

Arizona Social Science Standards

GEOGRAPHY

The use of geographic representations and tools help individuals understand their world.

5.G1.1 Use and construct maps and graphs to represent changes in the United States. Key concepts include but are not limited to physical and human features of the United States, the regions of the United States and their characteristics, geographic location of major events, the growth of the United States through territorial expansion, demographic changes, and the states and their capitals

7.G1.1 Use and construct maps and other geographic representations to explain the spatial patterns of cultural and environmental characteristics. Key tools and representations such as maps, globes, aerial and other photos, remotely sensed images, tables, graphs, and geospatial technology

Overview

Absolute location is a term used by geographers to find an exact spot on Earth. One way of finding absolute location is using latitude and longitude lines. While modern day devices do much of the thinking for us in locating ourselves and places, it is interesting to see how absolute location links to graphing positive and negative numbers.

Purpose

In this lesson, students will use latitude and longitude (coordinate math) to graph the shape of several sites around the United States.

Materials

- Famous Landmarks in the United States map
- Rulers
- Latitude and longitude Worksheet and Answer Key
- Landmark Grids 1-4 and Answer Keys
- Landmark 1-4 Coordinate Data
- Quiz and Answer Key

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Objectives

The student will be able to

1. Accurately locate a geographical feature using latitude and longitude on a map of the United States.
3. Complete a coordinate sheet that will show the outline of geographical feature by using XY axes.

Procedures

Students should have knowledge of latitude and longitude prior to attempting this lesson. On the globe, lines of constant longitude ("meridians") extend from pole to pole, like the segment boundaries on a peeled orange. On a globe of the Earth, lines of latitude are circles of different size. The longest is the equator. Students should have an understanding of simple XY coordinate procedures (X = horizontal; Y = vertical).

1. Open the lesson with a discussion of what are landmarks (a human or natural feature that is easily recognizable and may have special meaning to a group of people). Project the Famous Landmarks of the U.S. map and have the students discuss the landmarks shown.
2. Then ask students to find the latitude and longitude of 4 sites (Carlsbad Caverns, Niagara Fall, Mount Rushmore, and Grand Canyon) on the Famous Landmarks of the U.S. map.
3. Divide students into pairs. (Note: There are several levels of difficulty on the coordinate worksheets so this lesson can accommodate all students. #1=easiest, #2=moderate, #3=difficult, #4=easy.) Distribute the Landmark 1-4 Coordinate Data sheet, rulers, and the corresponding Landmark Grids 1-4 to the partners.
4. Explain that if the students correctly locate the coordinates on the Landmark Grid, a picture of a state in which the landmark is found will appear. Tell the students to write the name of the state at the top of the page.
5. When partners have drawn their maps/graphs, they should check with the answer key or teacher to make sure their answers are correct. The four sites are:
 - 1) GRAND CANYON
City: Grand Canyon

State: Arizona

Latitude: 35.9°N Longitude: 112.1°W

2) MOUNT RUSHMORE

City: Rapid City

State: South Dakota

Latitude: 43.5°N Longitude: 103.2°W

3) NIAGARA FALLS

City: Niagara Falls

State: New York

Latitude: 43.0°N Longitude: 79.0°W

4) CARLSBAD CAVERNS

City: Carlsbad

State: New Mexico

Latitude: 32.1°N Longitude: 104.2W

6. Conclude the lesson by Projecting the Famous Landmarks of the U.S. map. Distribute the Latitude and longitude Worksheet and Quiz. Have students complete both assessments.

Assessment

Geography and Mathematics

The Landmark Grids can be graded for accuracy using the following point system: state is correctly drawn = 15 points and the state name is correctly identified = 5 points. A score of 16 or higher will be considered mastery.

The Latitude and longitude Worksheet and Quiz can be graded for accuracy. Mastery will be seen as a score of 80% or higher.

Extensions

Show the photos of the landmarks included with the lesson.

Have students create a coordinate graphing activity for their favorite place in the U.S. using the same idea as when they plotted the coordinates on the grid. Then have partners trade and figure out the state where the favorite place would be.

Sources

Definitions of Latitude and Longitude - Glossary p. 64. National Geographic Map Essentials. NGS. 2001