√GEOMATH

What's My Piece of the Pie?
South American Demographics

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Grade Level	6-7
Duration	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
3. How to analyze the spatial organization of people, places, and environments on Earth's surface
Element 2: Places and Regions
4. The physical and human characteristics of places

AZ Standards

MATHEMATICS
Ratios of Proportional Relationships
6.RP.A.3. Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations.
c. Find a percent of a quantity as a rate per 100 (e.g., 30% of a quantity means $30/100$ times the quantity); solve problems involving finding the whole, given a part and the percent.
7.RP.A.3. Use proportional relationships to solve multistep ratio and percent problems.
The Number System
6.NS.B.2. Fluently divide multi-digit numbers using the standard algorithm.
7.NS.B.3. Solve real-world and mathematical problems involving the four operations with rational numbers
Standards for Mathematical Practice
6.MP.4. and 7.MP.4. Model with mathematics.

Arizona Social Science Standards

GEOGRAPHY
The use of geographic representations and tools helps individuals understand their world.
6.G1.1 Use and construct maps, graphs, and other representations to explain relationships between locations of places and regions
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
Global interconnections and spatial patterns are a necessary part of geographic reasoning.
7.G4.1 Analyze cultural and environmental characteristics among various places and regions of the world.

Overview

Graphs are a great way for students to visualize geographic information. Circle or pie graphs help students visualize information other types of graphs cannot show.

Purpose

In this lesson, students will construct and analyze pie graphs to show the breakdown of population and the amount of land area on the continent of South America. Students will then analyze the data and make connections.

Materials

- South America's Capital Cities https://geoalliance.asu.edu/sites/default/files/maps/s-america-caps.pdf
- South America Data Table
- Practice Sheet Land Area
- Answer Key--South America Land Area Table
- Chart and Graph Scoring Guide

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- Practice Sheet Land Area Multiple Choice and Answer Key
- Assessment and Answer Key
- Assessment Population Multiple Choice and Answer Key
- Colored pencils or markers
- Calculators (optional)

Objectives

The student will be able to:

1. Construct geographic representations of the land area and population of the countries of South America.
2. Calculate percentages using real world data.

Procedures

Prior Knowledge: Students know how to determine percentages.

SESSION ONE

1. Introduce the lesson by projecting a map of South America. https://geoalliance.asu.edu/sites/default/files/maps/s-america-caps.pdf Have students answer the following questions:
    a. Which of these countries has the largest amount of land? Smallest?
    b. Which of these countries has the greatest population? Smallest?
2. Explain that today they will be learning these facts but also practicing how to show geographic data. They will be constructing charts of information and then making circle/pie graphs.
3. Distribute the South America Data Table and the Practice Sheet Land Area. Instruct students to use the South America Data Table to fill in the missing data on their practice sheet (country name and area).
4. Remind students to title their data table and their circle graph. Explain that data tables and graphs need a title so that other people know what they are showing.
5. Optional: Distribute calculators.
6. Have students total the land areas and record it on their data table.
7. Model for students how to figure the percentage of **land area** for a country using Arizona and the U.S. as an example. Arizona has about 114,000 square miles. The U.S. has 3,796,742 square miles. Remind students that to calculate the percentage, they must divide Arizona by the total land area of the U.S. Then round to the nearest hundredth. For those less than 1%,

assign the value of 1%. Answer: Arizona is 3% of the U.S.
8. Model how the Arizona example of 3% would be shown on the circle graph. Be sure to point out that each division on the circle equals 10%.
9. Model how to color the appropriate section and make a key below the graph so that people will know what each color represents. Hint: Tell students to begin graphing the larger amounts first and work down as this will allow for enough space on the graph and avoid confusion.
10. When students have completed the Practice Sheet Land Area chart and graph, distribute the Practice Sheet Land Area Multiple Choice questions. Grade in class if time.

SESSION TWO

1. Go over the practice sheet from Session One by projecting the Answer Key for the Practice Sheet Land Area Multiple Choice questions if not already done in Session One. Then distribute the Chart and Graph Scoring Guide. Have students evaluate their own chart and graph from Session One so they can see their strengths and weaknesses.
2. Distribute the Assessment and the South America Data Chart. Instruct students to create the table and circle graph using the Population data. This time, there should be no teacher guidance.
3. When students have completed the Assessment, distribute the Assessment Population Multiple Choice questions.

Assessment

Geography and Mathematics

The Assessment Population Multiple Choice can be graded for accuracy. A score of 4 or higher is considered mastery on the multiple-choice questions.

The Assessment chart and graph can be graded using the Chart and Graph Scoring Guide. Mastery will be considered 24 points or higher on each product (chart and graph).

Extensions

- Students could graph the GDP of South America.

- Venezuela is losing population and per capita GDP while all the other South American countries are gaining in these demographics. Have

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students guess why this might be and then research the issue.

Sources

Size of AZ and U.S:
https://beef2live.com/story-ranking-states-area-89-118259

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