

Population Density: Whew, That's Close!

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Grade Level	6
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
2. How to use mental maps (a person's internalized picture of a part of Earth's surface) to organize information about people places, and environments in a spatial context
3. How to analyze the spatial organization of people places, and environments on Earth's surface

Element 4: Human Systems

9. The characteristics, distribution, and migration of human populations on Earth's surface.

Element 6: The Uses of Geography

18. How to apply geography to interpret the present and plan for the future

AZ Standards

MATHEMATICS

Ratios and Proportional Relationships

- 6.RP.A.1. Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities.

The Number System

- 6.NS.B.2. Fluently divide multi-digit numbers using the standard algorithm.

Statistics and Probability

- 6.SP.A.2. Understand that a set of data collected to answer a statistical question has a distribution which can be described by its center, spread, and overall shape.

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.

Human-environment interactions are essential aspects of human life in all societies.

- 6.G2.1 Compare diverse ways people or groups of people have impacted, modified, or adapted to the environment of the Eastern Hemisphere.

Examining human population and movement helps individuals understand past, present, and future conditions on Earth's surface.

- 6.G3.1 Analyze how cultural and environmental characteristics affect the distribution and movement of people, goods, and ideas.

Overview

One of the crucial differences in the way people live is reflected in their country or city's population density. Different population densities offer opportunities, create problems, and call for creative responses to various challenges.

Purpose

In this lesson, students will calculate population density of different countries and realize that there is a large spread between the lowest and highest statistics.

Materials

- Population Density Student Worksheet and Answer Key
- Population Density Classification Sheet
- World map
- Atlases
- Calculators (if desired)
- Colored pencils
- Meter or yardstick and masking tape
- Student Assessment for Geography and Answer Key

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Objectives

Students will be able to:

1. Understand the concept of population density as a ratio.
2. Calculate population density and understand these statistics have a spread of low, medium, and high in countries around the world.
3. Locate selected countries on a world map.
4. Formulate ideas about the ramifications of differences in population densities.

Procedures

1. Introduce the concept of population density as a ratio. Demonstrate by marking off a one meter square on the floor and have one student stand in it. Then have 10 students stand in it. Explain that this shows the difference between low and high-density areas. Share the definition for population density as number of people per square mile of land. Then discuss that this measurement is a handy statistic for understanding a country, but does this really mean that the people are evenly distributed per each mile?
2. Distribute the Population Density Classification Sheet. Have students work in small groups or individually to guess as to the population density for each of the listed countries. Their choices are high, medium or low. They should fill in the first guess column of the worksheet. As a whole class, have several students share their responses and the logic for their guesses. If students want to change their first guess, they should enter the new guess in the second guess column.
3. Explain the way population density is determined is to take the population of a country and divide it by the number of square miles in the country. Distribute the Population Density Student Worksheet. Do the United States example together.
4. Have students proceed to the next country, Brazil, and calculate the population density. Check for understanding. Then have students independently repeat these steps and complete the Population Density Student Worksheet.
5. When students are finished calculating population density, have them return to Population Density Classification Sheet and make their final judgment as to high, medium or low population density and fill in the conclusion column.
6. Distribute colored pencils, atlases, and World map. Have students select one color and locate and color all of the countries with high population density. They should also label the country with its name. Instruct students to repeat this step with a different colors for the low and medium population

density countries. Be sure to remind students to create a key for the colors on their maps. Note: Not all students need to agree on what is high, medium, or low. It is important that they see a spread of data.

7. Have a class discussion. Discuss with students as to why different countries have different population densities. Discuss what opportunities might exist in a low-density country that might not exist in a high-density country and vice versa. Also, discuss what problems or challenges might exist in one density but not in one of the other densities.
8. Have students speculate on how houses or dwelling sizes might differ. Speculate further on farm sizes, parks and open spaces, and transportation networks. Have students complete Student Assessment for Geography.

Assessment

Mathematics and Geography

Discuss with the class the conclusions on the classification sheet. Because there are multiple valid ways of classifying the densities, grade for completeness. The Population Density Student Worksheet can be graded for correct calculations. Mastery will be considered 80% or higher on the worksheets.

Geography

Students should complete the Student Assessment for Geography (6 points) and locate the correctly countries on the world map. Mastery is considered 80% or higher.

Extensions

Investigate the population density of students' own town. For instance, Flagstaff has approximately 635 people per square mile, a rate exceeded by a number of countries. The data necessary is available your local city planning department.

Fun Facts to Share with Students

About 90% of the earth's people live on 10% of the land. Additionally, about 90% of the people live north of the equator.

Population density of the continents:

- * North America - 57 people per square mile
- * South America - 57 people per square mile
- * Europe - 188 people per square mile
- * Asia - 246 people per square mile
- * Africa - 87 people per square mile
- * Australia - 8 people per square mile

<https://www.worldatlas.com/articles/continents-by-population-density.html>

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The population density of the planet (including all land area) is about 129 people per square mile.
https://en.wikipedia.org/wiki/Population_density

Sources

https://en.wikipedia.org/wiki/Population_density

<https://www.worldatlas.com/articles/continents-by-population-density.html>

<https://www.cia.gov/library/publications/resources/the-world-factbook/>