



mobile inquiry technology
Teacher Notes

Investigating Populations Introduction

In this activity, students will explore visual maps and models to explore population data and percentages. Students will compare and order population data and display this data in a variety of ways.

Students will use a paint program to relate population data to area. They will also use a spreadsheet to display the same data in a model as a prediction of future population growth.

Students will develop a number of key concepts related to percentages including:

1. investigating the different visualizations of data;
2. comparing and order data and relate to percentages;
3. applying knowledge gained to build, extend, and describe patterns that grow.





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Discussion Guide

Display a world map to the students. Review with the students the major areas including Africa, North and Central America, South America, South America, Asia, Europe, former USSR, and Oceania (the countries like Australia, New Zealand, etc.). Direct the students to "Thinking About the Question". Ask the students to share where they think the greatest population exists in the areas described above.

Ask the students to think about how they would display populations of the world if they had the data. Suggest percentages, different types of graphs, and the use of color coding that would rank the areas based on population on a map. Explain to the students that each type of these will be used in this activity. Encourage the students to predict if different areas of the world with larger populations may exist in smaller land areas.

Ask the students to define in their own words the following terms: birth rate, death rate, and life expectancy. Ask them how these affect world population. Students may wish to discuss the difference in countries that limit births and those that have short versus long life expectancies.

Introduce the concept of "carrying capacity". Carrying capacity is the maximum population that a given area or habitat can support over a given period of time. Challenge the students to look at factors that affect carrying capacity. List their ideas after ten minutes. The list may include food, energy, living space, disease, natural disasters, etc.

The final investigation in this activity will present a model of population growth up to the year 2100. Remind the students that population growth can be altered and is also limited by the amount of resources. Discuss with the students the balance in all factors (birth rate and resources) that the world must have to sustain life. Ask the students to keep this in mind as they complete this activity.

Direct students to "Investigation I".





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Additional Teacher Background

If a population were presented with unlimited resources, it would grow exponentially. But this hardly ever occurs in a natural environment since they are seldom constant and resources have limitations. These limitations are called growth-limiting factors or environmental limitations.

Growth-limiting factors don't operate only in one direction. These factors interact with populations as populations grow. For example, as a population's density increases, competition for a particular resource is increased (e.g., food, water, etc.). Increased density interacts with decreased resources to slow population growth until growth stops.



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Investigating Populations Suggested Timeline

The amount of time you spend on introductory discussions, data collection, and analysis, will determine your overall timeline. The following represents a possible timeline.

- One class period - Introductory Discussion
- One class period - Investigation I: Visualizing world data
- One class period - Investigation II: Taking a closer look at world data
- One class period - Investigation III: Predicting future world population
- One class period - Analysis

Additional days can be used for further investigations.



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