World population
from the Esri GeoInquiries™ collection for Human Geography

**Audience – Advanced human geography**

**Time required – 15 minutes**

**Activity**
Explore the patterns of world population in terms of total population, arithmetic density, total fertility rate, natural increase rate, life expectancy, and infant mortality rate.

**APHG Benchmarks**
APHG: II.A. Analyze the distribution patterns of human populations.
APHG: II.B. Understand that populations grow and decline over time and space.

**Learning Outcomes**
• Students will identify and explain the spatial patterns and distribution of world population based on total population, density, total fertility rate, natural increase rate, life expectancy, and infant mortality rate.

**Map URL:** http://esriurl.com/humanGeolnquiry3

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**Ask**

**What are the most populated countries?**
- Click the map link above to start the map.
- With the Details pane visible, click the Content button.
- To show a legend, click on the layer name, World Population.
- How many people does the largest symbol represent? [1 million]
- Click those countries and examine their pop-ups.
- Which two countries have the highest populations? [China and India]
- Which other countries have populations over 200 million? [United States, Indonesia, and Brazil]

**Acquire**

**Where are the most densely populated countries located?**
- Turn off the layer, World Population.
- Turn on the layer, Population Density.
- Hover over the layer name, Population Density. Click the button, Show Table.
- Sort the Population Density 2017 column in descending order. (See the ToolTip on page 2.)
- Which places have the highest densities? [Macao and Monaco]
- What factors account for the countries with high population densities? [Smaller land area, islands, low-lands, favorable climates, and water access]
- What factors account for the countries with low population densities? [Large land areas, extreme climates, mountainous regions, and being landlocked]

**Explore**

**How are total fertility and infant mortality related?**
- Turn on only the layer, Total Fertility Rate (TFR). Close any open table.
- What pattern is observed? [Highest fertility rates are in Africa and lowest in Eastern and Southern Europe.]
- Examine the pop-ups of at least three countries.
- How have total fertility rates changed over time? [fertility rates have decreased]
- Turn off the layer, Total Fertility Rate (TFR).
- Turn on the layer, Infant Mortality Rate (IMR).
- What is the relationship between infant mortality and total fertility? [higher infant mortality rates correspond to high total fertility rates]
Analyze

Which regions are gaining or losing population?

- Turn on only the layer, Natural Increase Rate (NIR).
- Which region has the highest NIR? [Sub-Saharan Africa.]
- Which country has the highest NIR in 2016, and what is the rate? [Niger has a rate of 3.7%.]
- Which country has the lowest NIR in 2016, and what is the rate? [Bulgaria has a rate of -0.6%.

Act

What can be done to increase or slow population growth?

- What challenges do societies with high or low NIRs face? [Housing, health care, schooling, and employment are some challenges faced.]
- What are some steps that government or non-government agencies can take to slow population growth? [Tax incentives, education, and birth restrictions can slow population growth.]

Next Steps

DID YOU KNOW? ArcGIS Online is a mapping platform freely available to public, private, and home schools. A school subscription provides additional security, privacy, and content features. Learn more about ArcGIS Online and how to get a school subscription at http://www.esri.com/schools.

THEN TRY THIS...

- Have students create and save their own maps by adding a different world population layer, and filter it based on the highest or lowest value.
- Add city population data and create density maps at the state, national, or regional scale.

This GIS map has been cross-referenced to material in sections of chapters from these texts.

- Human Geography by McGraw Hill – Chapter 2
- The Cultural Landscape by Pearson – Chapter 2
- Human Geography: People, Place, and Culture by Wiley Press – Chapter 2

REFERENCES

- Human Geography by McGraw Hill – Chapter 2
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