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/humanGeoInquiry3

❓ 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, lowlands, 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%.]*
? In which regions are populations decreasing? *[Western and eastern Europe, as well as Japan.]*
→ Hover over the layer name, Natural Increase Rate. Click the button, Show Table.
→ Sort the table descending and scroll down. (See ToolTip below.)
? Which country has the lowest NIR in 2016, and what is the rate? *[Bulgaria has a rate of -0.6%.]*
→ Close any open table.
→ Turn on the layer, Life Expectancy.
? What is the relationship between life expectancy and the Natural Increase Rate? *[People in countries with higher life expectancies are having fewer children (lower NIR).]*

✅ 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.]*

TABLE SORTING

- In the Details pane, click button, Show Contents of Map.
- Hover over a layer name.
- Click the button, Show Table.
- Click the field name (column header).
- Choose Sort Ascending or Sort Descending.

IDENTIFY A MAP FEATURE

- Click a feature on the map, and a pop-up window will open with information.
- Links and images in the pop-up are often clickable.
- An arrow icon in the upper right of the window indicates that multiple features have been selected.
- Click the button to scroll through the features.

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.

📖 TEXT REFERENCES

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*