

---

# World Population

Audience: Year 11 Geography

Time Required: 15 minutes

---

- Activity:** This activity explores the patterns of world population in terms of total population, arithmetic density, total fertility rate, natural increase rate, and infant mortality rate.
- Standards:** Some possible links to NZ Curriculum in this inquiry  
Geography AS 91013
- Describe aspects of a geographic topic at a global scale
- 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, and infant mortality rate.
- 

**Map URL:** <http://arcg.is/aeW0b>

---

## Ask

### What are the most populated and least populated countries?

- Click the map URL link above to start the map.
  - With the Details pane visible, click the button, Show Contents of Map (left side, small middle button).
  - To show a legend, click on the layer name, World Population.
  - Hover your mouse over the layer name. Click the button, Show Table.
  - Sort the data to answer the following questions. For help, see the tool tips at bottom of page 2.
- ? Which countries have the highest populations (2014)? *[India, China, & U.S. have the highest populations.]*
- Close the table by pressing the X button in the upper right corner of the table.

## Acquire

### Where are the most densely populated countries located?

- Turn off the layer, World Population. Turn on the layer, Population Density.
  - Click the Basemap. Select the basemap, National Geographic.
  - Click some of the countries to obtain pop-up information.
- ? What patterns do you notice in population density? *[Asia is densely populated.]*
- ? What factors influence the countries with the highest population densities? *[Smaller land area, islands, lowlands, favourable climates, and water access influence those countries.]*
- ? What factors influence the countries with the lowest population densities? *[Large land areas, extreme climates, mountainous regions, and being landlocked influence those countries.]*

## Explain

### What is the relationship between total fertility rate and infant mortality rate?

- Turn on only the layer, Total Fertility Rate (TFR).
- Hover over the layer name. Click the button, Show Table. Click column headers to sort.
- ? Which countries have high TFR (2013), and what is the rate? [*Niger, Mali, Somalia - rates greater than 6.5.*]
- ? Which country has the lowest TFR (2013)? [*Macau and Hong Kong*]
- Close the table. Turn off the layer, Total Fertility Rate (TFR). [ Turn on the layer, Infant Mortality Rate (IMR).
- Hover over the layer name. Click the button, Show Table. Click column headers to sort.
- ? Which country has the highest IMR, and what is the rate? [*Sierra Leone has a rate of 107.*]
- ? Which country has the lowest IMR? [*Many countries have the lowest rate of 2.*]



## Analyse

### Why are some countries gaining or losing population?

- Turn on only the layer, Natural Rate of Increase (NRI).
- Hover over the layer name. Click the button, Show Table. Click column headers to sort.
- ? Which region has the highest NRI? [*Sub-Saharan Africa.*]
- ? Which country has the highest NRI (2013), and what is the rate? [*Niger has a rate of 3.9%.*]
- ? Which region's populations are decreasing? [*Western and eastern Europe, as well as Japan.*]
- ? Which country has the lowest NRI, and what is the rate? [*Bulgaria and Serbia have rates of -0.5%.*]
- Turn off the layer, Natural Rate of Increase. Close any open table. [ Turn on the Life Expectancy layer.
- Change the transparency for the NRI layer to 50%.
- ? What is the relationship between life expectancy and the NRI? [*People in countries with higher life expectancies are having fewer children (lower NRI).*]

## Act

### What can be done to decrease or increase population growth?

- ? What challenges do societies with high or low NRIs 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.*]

## Key Skills

---

### Sorting ascending and descending

- 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.

### Transparency

- In the Details pane, click button, Show Contents of Map.
- Hover over a layer name.
- Click the three small dots.
- Select the option, Transparency.
- Modify the layer's transparency to show layers beneath.

## Next Steps

**DID YOU KNOW?** ArcGIS Online is a mapping platform freely available to New Zealand public and private 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.eagle.co.nz/gis-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

- Anderson, Lois. Population Concepts NCEA Level1. Pearson 2013

## NEW ZEALAND GEOINQUIRIES

<http://arcg.is/1GPDXe>