## Growing Pains
from the Esri GeoInquiries™ collection for World Geography

<table>
<thead>
<tr>
<th>Target audience – World geography learners</th>
<th>Time required – 15 minutes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Activity</td>
<td>A comparison of the processes and implications of population growth in one of the world’s fastest-growing regions, sub-Saharan Africa, and the slowest-growing region, Europe.</td>
</tr>
</tbody>
</table>

### Social studies standards

| C3:D2.Geo.8.6-8. Analyze how relationships between humans and environments extend or contract spatial patterns of settlement and movement. | C3:D2.Geo.3.6-8. Use paper-based & electronic mapping & graphing techniques to represent & analyze spatial patterns of different environmental & cultural characteristics. |

### Learning Outcomes

- Describe the fundamentals of population growth by explaining the relationship between birth rate, death rate, and natural increase.
- Identify the fastest- and slowest-growing regions in the world today.

Map URL: http://esriurl.com/worldGeolnquiry6

### Ask

**How do birth rates compare globally?**

- Click the link above to launch the map.
- With the Details button underlined, click the button, Show Contents.
- Click the PG-Birth Rate/Births Per 1000 layer name to see the layer’s legend. *(Note: PG is population growth.)*

? Which world regions had the highest birth rates in 2014? *(Africa and Afghanistan)*

? Which world regions had the lowest birth rates? *(North America, Europe, Russia, and Australia)*

### Acquire

**How do death rates compare globally?**

- Check the box to the left of the layer name, PG-Death Rate/Deaths Per 1000. Click the layer’s name.

? Which world regions had the highest death rates in 2014? *(Africa and Afghanistan)*

? Which world regions had the lowest death rates in 2014? *(Mexico, Central America, western South America, Northern Africa, and Southwest Asia)*

### Explore

**How do birth and death rates in European countries compare with African countries?**

- Search for the European country Hungary and review its pop-up information. *(See the Search By Location ToolTip on the next page for details.)*

? What are the birth and death rates of Hungary? Spain? *(Hungary: BR is 9.26%, DR is 12.72%; Spain: BR is 9.88%, DR is 9.00%)*

? What are the birth and death rates for Ethiopia and Chad? *(Ethiopia: BR is 37.66%, DR is 8.52; Chad: BR is 37.29%, DR is 14.56)*
Analyze

Are birth and death rates the best indicators of country growth?

- With both PG-Birth Rate and PG-Death Rate layers turned on, turn the PG-Death Rate layer off and on to compare birth and death rates.

- Which world regions do you think are growing the fastest? [Answers will vary.]
- Which world regions do you think are growing the slowest? [Answers will vary.]

Act

What is the overall country growth rate?

- The Natural Increase formula is (Birth Rate - Death Rate) / 10 = Natural Increase and represents the number of people per 1,000. (For example; Darker-colored countries add between 22 and 34 people to their populations each year for every 1,000 people already there.)
- Turn off all active layers. Turn on the PG-Natural Increase layer.
- View the PG-Natural Increase layer legend.
- In the upper-left corner of the map, click the Default Extent (house) button.
- What is happening to the populations of countries that are beige? [Their death rates exceed their birth rates and they have a negative natural increase.]
- Which world regions are growing the fastest? [Sub-Saharan Africa, Afghanistan, and Yemen]
- Which world regions are losing people or not growing? [Eastern Europe, Russia, and Japan]
- What are some problems that you would expect in a rapidly growing country, in one that is shrinking or slow-growing? (Teacher-supported discussion on education, health care, social infrastructure, resources, and jobs; loss of industry, inability to fill industrial or technology jobs, pressure to increase immigration, and so on.)

Search by Location

- In the Find Address Or Place (search) field, type a place name or keyword.
- Choose a search result that appears below the field or click the Search button.

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...

- To see which countries have a greater-than-average natural increase, try the following:
- Above the Contents pane, click Analysis.
- Expand Find Locations, and then click Derive New Locations.
- Click Add Expression, and then build the following expression: Natural Increase Where Natural Increase Is Greater Than 1.07.

Text References

- World Cultures and Geography by McDougal Littell
- My World Geography by Pearson

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