

Population Pyramids

Substandard C - Spatial Organization

Sub-Strand: The student will understand the regional distribution of the human population at local to global scales and its patterns of change.

Benchmark 3: Students will use population pyramids and birth and death rates to compare and contrast the characteristics of regional populations at various scales.

Grade Level: 9-12

Overview: This lesson is designed to teach students how to build and analyze population pyramids and examine changing birth and death rates and the impact this data has on a regions economic and political geography.

Time: This lesson will take 3-5 periods of approximately 50 minutes, depending on number of graphs made.

Subjects: Geography

Required Materials:

Data sets for various counties, and states available from the US Census Bureau

Several pre-made Pyramids for examples

Internet access

[Population Definitions](#)

[Population Pyramid Analysis](#)

[Building Pyramids handout](#)

[Population Pyramids Presentation](#)

Optional Technologies: This lesson uses Microsoft Excel (time in the computer lab two to three 50 minute periods)

PowerPoint and Projector for introductory slides and discussion (may use overhead transparencies)

Objectives: After completing these activities a student should be able to:

- define the relevant population vocabulary
- explain the significance of population trends on world regions
- examine age-gender patterns at various scales

Suggested Procedure:

Day 1: Using either the overheads or the power point presentation explain that population pyramids: graphically display a population's age and gender composition; are bar graphs;

show numbers or proportions of males and females in each age group; show gains of cohort members due to immigration and birth, and loss of cohort members due to emigration and death; and reflect population growth or decline.

On the first sample point to the horizontal bars, which show the percentage (or the absolute number) of males and females in each age group. Explain that a pyramid shows the history of a country's population growth. Using the US as an example describe trends associated with the Great depression, the Baby Boom from 1945 to 1965 and the boomlet of the 1980's. Point to these groups on the pyramid.

Have students interpret the charts. Which age group has the greatest proportion of people? Which bar includes the students in this classroom? Are there more people in your age group or in the age group below yours? What could this kind of chart tell you about a population? Why would a country 's leaders want to know the proportion of the population in different age groups? What difference does the age of the people in a country make? (People of different ages have different needs) What kinds of products do young people use? What kinds of services do they need? (diapers, day care, toys, health care, schools, etc.) What about older people? (different kinds of health care, different foods, different products) Is it important for a government leader or planner to know the age of the population they are serving?

Day 2, 3, & 4: In the computer lab:

1) Distribute the Population Pyramid Analysis Questions. Students should visit the IDB Population Pyramids page at the US Census Bureau web site. (address at) <http://www.census.gov/ipc/www/idbpyr.html> Have them make and analyze pyramids for several different countries. I usually have quarter sheets of paper with six countries listed and pass them out so that each student is investigating a different set of countries.

2) Distribute Building Pyramids instructions and data sets. I make students do 6-8 data sets for 3-4 states and 3-4 counties. I get these data sets from the US Census Web site at <http://www.census.gov/index.html> You have to do a little exploration on how this site might best serve you. (I usually have to download or cut and paste to get the data into a format usable by students and I make sure that I have a variety of counties and states and I usually update my data sets every 5 years or so.) Have students answer the same questions for these pyramids as they did for the country pyramids above.

Day 5: Follow up by having students explain their analysis of the population pyramids they created.

Student Activity—Online:

<http://www.census.gov/ipc/www/idbpvr.html>

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Definitions

birth and death rate -- the annual number of births and deaths per 1,000 total population. These rates are often referred to as "crude rates" since they do not take a population's age structure into account.

rate of natural increase (RNI) -- birth rate minus the death rate, implying annual rate of population growth without regard for migration

population "doubling time" -- the number of years it will take for a population to double assuming a constant rate of natural increase

infant mortality rate -- the annual number of deaths of infants under age 1 year per 1,000 live births

total fertility rate (TFR) -- the average number of children a woman would have assuming that current age-specific birth rates will remain constant throughout her childbearing years (usually considered to be ages 15-49)

population under age 15/age 65+ -- the percentage of the total population in those age groups, which are often considered the "dependent ages"

life expectancy at birth -- the average number of years a newborn infant can expect to live under current mortality levels

urban population -- percentage of the total population living in areas termed "urban" by that country. Typically, the populations living in towns of 2,000 or more or in national and provincial capitals are classified urban.

percent of women ages 15-19 giving birth each year -- percentage of women ages 15-19 giving birth in a given year

government view of current birth rate -- the officially stated position of country governments on the level of the national birth rate

per capita GNP -- gross national product includes the value of all domestic and foreign output

immigration -- people migrating into a particular country or area

emigration -- people migrating out of a particular country or area

demographic transition model -- multi stage model, based on Western Europe's experience, of changes in population growth exhibited by countries undergoing industrialization. High birthrates and death rates are followed by plunging death rates, producing a huge net population gain; this is followed by a drop in birth rates and a balance of both at a much lower level.

age cohort -- a group of individuals born within a specific time frame

age-sex pyramids (population pyramids) -- The most important demographic characteristic of a population is its age-sex structure. Age-sex pyramids (also known as population pyramids) graphically display this information to improve understanding and ease comparison. Age-sex pyramids display the percentage or actual amount of a population broken down by gender and age. The five-year age increments on the y-axis allow the pyramid to vividly reflect long-term trends in the birth and death rates but also reflect shorter-term baby booms, wars, and epidemics.

National Geography Standards:

Supplemental Web Links for Teachers and Students

US Census Bureau: <http://www.census.gov/index.html> This is the best starting point for all kinds of data on population. The related links connection on the left side of the page connects to statistical agencies in other countries.

Geographic.org: <http://www.geographic.org/> Ranked information about the world's countries.

Facing the future: <http://www.popinfo.org/> Facing the future, lots of information on population. Good lesson plans and activities.

PopulationReference Bureau: <http://www.prb.org/> Classic source for information about the world's population.

People and the Planet <http://www.peopleandplanet.net/> Many good activities for all grade levels. Readings on population written at different reading levels are useful for mixed ability group

WorldometersTM <http://www.osearth.com/resources/worldometers/worldcrew.shtml> constantly running counters that update world data.

(URL may have changed)

Extension:

Credits

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