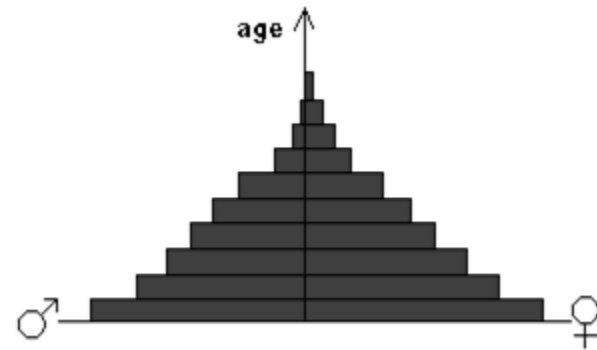


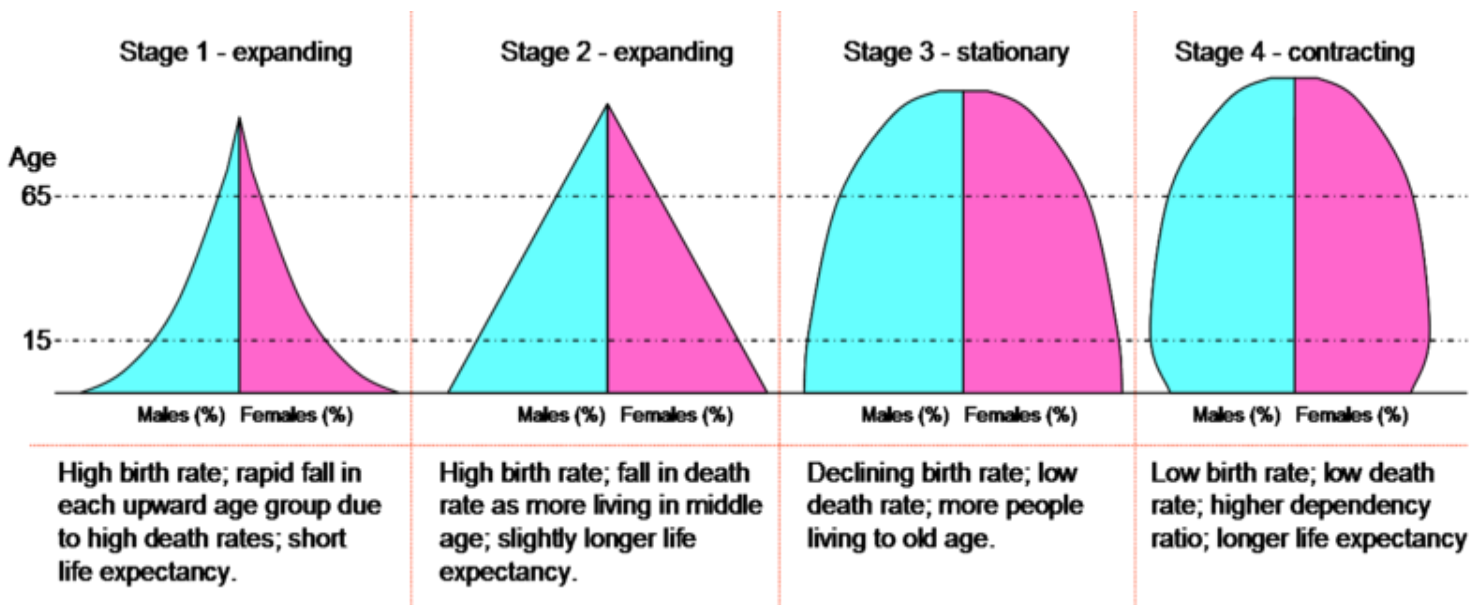
# Power of the Pyramids

**Purpose:** To show the age and gender distribution within a large population in order to help realize the growth rates of a country's population. In this exercise, students will construct and interpret population graphs and discuss the differences in growth rates among several different countries. Skills used will include math calculations, graphing, data analysis, collection & interpretation.



**Materials:** Colored pencils/crayons; internet access; ruler; calculator; graph paper

**Background Information:** Demography is the statistical study of human populations, especially with reference to size, density, distribution, and vital statistics (relating to births, deaths, marriages, health and disease, etc). In making population projections for different countries, demographers look at the profile of the countries' residents. They ask: What are the ages of the people? How many are men? How many are women? Using this information, they construct "population pyramids" (a.k.a. age histograms) like the ones the class will create in this activity. These graphs illustrate the configuration of a country's population as shaped by 70 to 80 years of economic, political and natural events. As the class will see, the graphs can also help predict future population trends. Countries with GNI less than about \$3500 are considered less developed; greater than about \$15,000 are more developed. Ones in between are in transition (developing).



## Procedure:

### Part I: (pre-lab information collection)

1. Collect your data: Generate a report containing the following information ( you can just print these thing. Use the year 2010):
  - a. Title
  - b. Map showing the location of your country (regional map is fine)
  - c. Include the information generated by the Population Reference Bureau website (next page) – you can simply print this report
  - d. Pyramid – must construct on the graph paper provided.
2. Construct your pyramid for your country to be included on your poster.
  - a. Determine the percentage of the population made up of each gender's age group. This is done by dividing each segment's population by the *total* population. The percentages should add up to equal 100. \*\*The percentages provided to you are NOT percents of the total population. You can have Excel do this for you, but you still need to practice how to determine the percentages on your own.

Ex: the United States' total population in 1995 was 263,119,000. The population of males ages 0-4 was 10,515,000.

$$\frac{10,515,000}{263,119,000} \times 100 = 4\%$$

- b. Using this information, construct the age-sex histogram which compares the gender and age ranges of the members of the country (directions given in class).
  - c. Use 3 different colors – one color for 0-14 years old (Pre-Reproductive); 15-44 (Reproductive); 45+ (post reproductive)
3. Be prepared to discuss the state of your country by reading over all of your reports.

### Part II – In Class Analysis

1. Compare the information you have collected to the information that other students have collected to see how More Developed Countries differ from Developing & Less Developed Countries

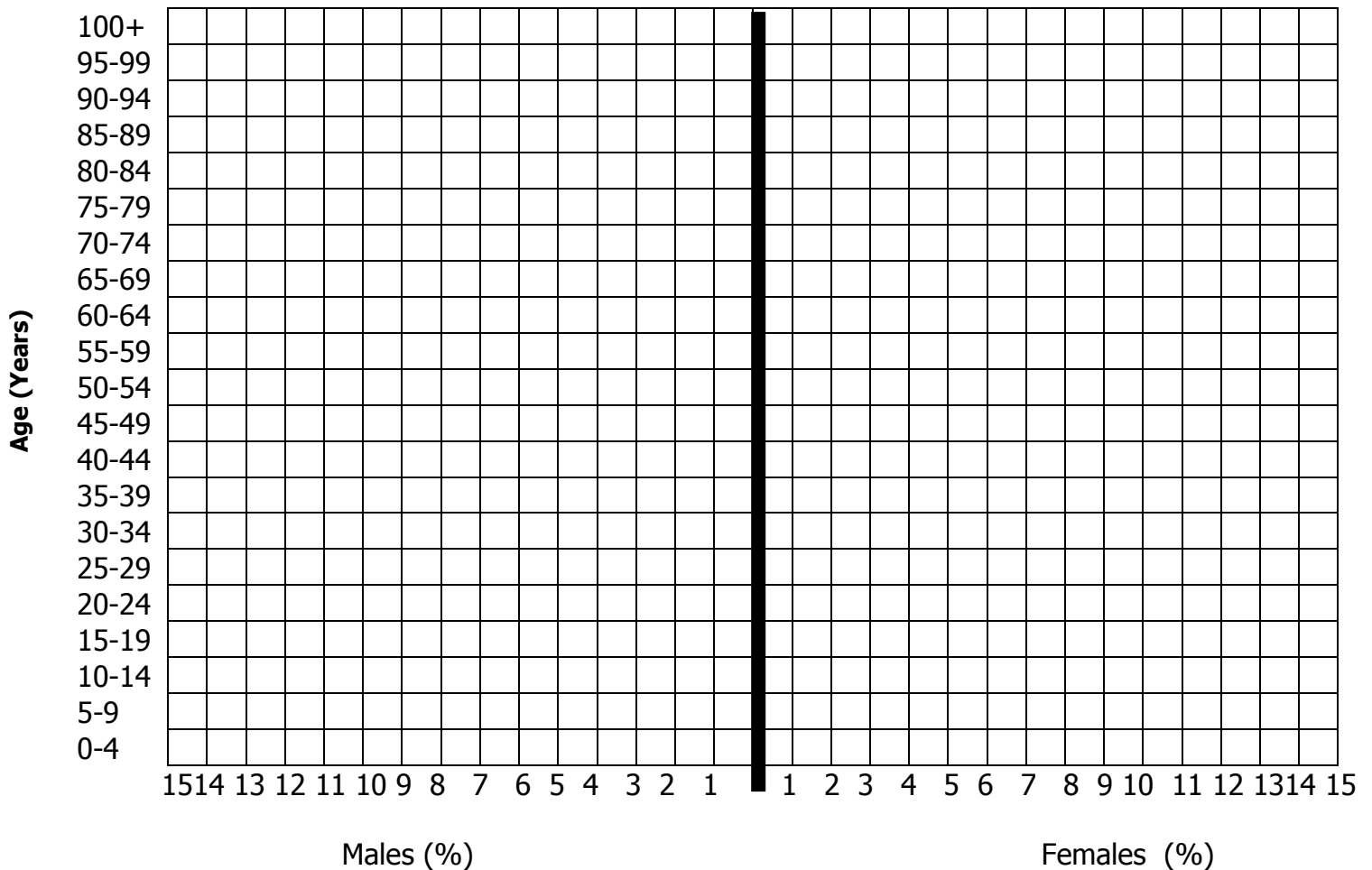
NOTE: If you do not have your Part I ready to go for class, you will have to do the entire project (where you have to get information from 9 countries) on your own & you will have a 30% reduction in your grade!

#### Pyramid Construction Hints

1. What if you messed up your graph & you need another copy?
  - a. Go to the website & print off ONLY that one page.
2. What if your country has a % that is higher than 9% for males or females?
  - a. If it's slightly above 9%, just go off the graph a little bit.
  - b. If it's above 10%, you have two options:
    - i. If it's 15% or higher, cross out the numbering & renumber the x-axis by 2's.
    - ii. If you don't want to do that, go onto my website & pull up the activity (see directions above). Go to the graph. Highlight as many columns as you would like to add on the left of the black line (i.e., if you want to add 5% - 5 columns – highlight 5 columns). Right click on the highlighted box. Go down to "insert" and click on "Insert columns to the left". Do the same on the right side of the black line, except this time click "insert columns to the RIGHT". You'll need to change the numbers along the x-axis as well.

## Internet Instructions for Age-Sex Histogram

1. Log onto the web and go to [www.census.gov](http://www.census.gov)
  - a. Click on the "Topics" tab (top left)
  - b. Click on "Population"
  - c. Click on "International" (bottom of 1<sup>st</sup> column)
  - d. Click on "International Data Base" (on the left)
  - e. In the dropdown menu "Select Report", choose "Population by Five Year Age Group"
  - f. Under "Year" choose 2010
  - g. Select your country
2. Use the data from this report to construct an Age-Sex Histogram on the graph provided below. Cut this out & paste it to your poster.



## **Directions for Other Demographic Information to be included in your report**

Directions: Generate a report by doing the following:

Go to the Population Reference Bureau website: <http://www.prb.org/DataFinder.aspx>

- ✓ Under the "International" heading (on the left), click on "Countries"
- ✓ Choose your country
- ✓ Next to the name of your country, click "Change Locations / Indicators"
- ✓ Under the "Locations" box, click on "World" and on the + beside "International"
- ✓ Choose "countries" & choose your country (in the "Selected Location" box below this you will see "World" & your country's name)
- ✓ Create & PRINT OFF your own customized report by clicking on the following:
  - Under "Indicators" un-click "Highlights"
  - Click the + key next to each of the following & click in the boxes that pop up.
  - Demographics
    - 2050 Population as a Multiple of 2011
    - Birth Rate (annual number of births per 1,000 total population)
    - Death Rate (annual number of deaths per 1,000 total population)
    - Infant Mortality Rate (infant deaths per 1,000 live births)
    - Life Expectancy at Birth, by Gender
    - Median Age of Women at First Marriage, by Age Group
    - Net Migration Rate
    - Rate of Natural Increase
    - Total Fertility Rate
    - Urban Population
    - Urban Population Living in Slums
  - Economic
    - GNI PPP Per Capita (US\$)
    - Population Living Below US\$2 per Day
  - Education
    - Literacy Rate of Persons Ages 15-24, by Gender
    - Secondary School Enrollment, by Gender
  - Environment
    - CO2 Emissions per Capita (metric tons)
    - Density (people per sq. km.)
    - Motor Vehicles per 1,000 Population
    - Natural Habitat Remaining
    - Population Using Improved Sanitation, by Region
    - Population Using Improved Water Supply, by Region
  - Health
    - Undernourished Population
  - HIV/AIDS
    - HIV/AIDS Among People Ages 15-49
  - Reproductive Health
    - Abortion Policy
    - Births to Women Under Age 20 Attended by Skilled Personnel
    - Contraceptive Use Among Married Women Ages 15-49, by Method Mix
    - Contraceptive Use Among Married Women Ages 15-49, by Method Type
    - Knowledge of Family Planning Among Married Women Ages 15-49, by Method
    - Mean Ideal Number of Children, by Gender and Age Group
    - Unmarried Persons Ages 15-19 Who Have Had Sex, by Gender
    - Women Ages 15-19 Giving Birth in One Year
    - Women Ages 20-24 Giving Birth by Age 18
    - Women's Median Age at First Intercourse, by Age Group

Click "Continue" at the bottom & print your report.

Countries to choose:

<b>More Developed Countries</b>		
1	United States	
2	Germany	
3	Japan	
4	Australia	
5	Finland	
6	Italy	
7	Switzerland	
8	United Kingdom	
9	Romania	
10	Russia	
11	Slovenia	
12	Lithuania	
13	Iceland	
<b>Less Developed Countries</b>		
14	Lesotho	
15	Argentina	
16	South Korea	
17	Brazil	
18	Mexico	
19	China	
20	Dominican Republic	
21	India	
22	Israel	
23	Jamaica	
24	Ecuador	
25	Egypt	
26	Thailand	
<b>Least Developed Countries</b>		
27	Afghanistan	
28	Burundi	
29	Chad	
30	Bangladesh	
31	Liberia	
32	Madagascar	
33	Malawi	
34	Kenya	
35	Mozambique	
36	Rwanda	
37	Sierra Leone	
38	Ethiopia	
39	Mali	

# Power of the Pyramids

Name: \_\_\_\_\_ Period \_\_\_\_\_

Map: \_\_\_\_\_/5

Pyramid: \_\_\_\_\_/10 PRB: \_\_\_\_\_/10

Final Grade: \_\_\_\_\_/100

**Round 1:** Working with other people with similar countries as yours

Purpose: To determine how countries with similar annual growth rates (population) will have similar societies.

Procedure: Through discussion with other people in your group, answer the following questions as thoroughly as possible. Be ready to share your findings with people in your smaller groups.

1. Your Country: \_\_\_\_\_ Is your country a MDC, LDC, Least DC?
2. Name all of the countries in this group: \_\_\_\_\_  
\_\_\_\_\_
3. Compare the shapes of the pyramids of all of your countries. Which countries have very similar pyramids?
4. Are there anomalies when comparing pyramids (in other words, are there any pyramids that just aren't like the others?) Do you have any speculations as to what societal events may have resulted in this shape? Explain.
5. In which continents / regions of the world are most of your countries located?
6. Looking at all of your countries, provide a general trend for each of the following factors. Use statistics to provide a range, where appropriate. If you have 1-2 countries that are outliers, point those out as well.
  - a. Generalization of Percentage of the population under the age of 15 (read your pyramids)
  - b. Birth Rates
  - c. Death Rates
  - d. Infant Mortality
  - e. Life Expectancy
  - f. Rate of Natural Increase
  - g. Total Fertility Rate
  - h. Urban Population Living in Slums
  - i. GNI (Per capita \$US)
  - j. Secondary School Enrollment
  - k. CO<sub>2</sub> Emissions per capita (metric tons)
  - l. Population using Improved Sanitation

- m. Undernourished Population
- n. HIV / AIDS among people ages 15-49
- o. Abortion Policy
- p. Knowledge of Family Planning Among Married Women Ages 15-49

**Round 2:** Working with people who have countries that are different than yours

Purpose: To see how societal factors play a role in the number of children that a country will have, as well as how the impact different countries will have based on their populations.

Procedure: Get into groups of 3 – one person from a MDC, one from a LDC & one from a Least DC. Answer the following questions.

1. Your Country: \_\_\_\_\_ Is your country a MDC, LDC, Least DC?
2. Name all of the countries in this group: \_\_\_\_\_  
\_\_\_\_\_
3. Compare the shapes of the pyramids of all of your countries. How do the shapes of the pyramids differ based on the country's background?
4. If your country was not like the other countries in your original cohort (i.e. your country's pyramid was different from everyone else who was in a MDC), explain how it was different & what should have been expected.
5. In which continents / regions of the world are your countries located?  
MDC: \_\_\_\_\_ LDC: \_\_\_\_\_ Least DC: \_\_\_\_\_  
Do you think the climate / topography of the land plays a role in these country's successes or failures? Explain.
6. Looking at all of your countries, provide a *general trend* for each of the following factors. Use statistics to provide a range, where appropriate. A "comparison" requires a brief explanation of multiple countries. It is ok to provide generalizations. If you have a country that is not like others in your original cohort, use the generalizations you made from Round 1 to help answer the questions below.
  - a. Generalization of Percentage of the population under the age of 15 (read your pyramids)
  - b. Birth Rates
  - c. Death Rates
  - d. Infant Mortality
  - e. Life Expectancy
  - f. Rate of Natural Increase
  - g. Total Fertility Rate
  - h. Urban Population Living in Slums





6. What is the correlation between Population using Improved Sanitation vs Death Rates?
  
  
  
  
  
  
  
  
  
  
7. What is the correlation between Population Using Improved Sanitation vs GNI?
  
  
  
  
  
  
  
  
  
  
8. What is the correlation between Knowledge of Family Planning vs Infant Mortality Rates?
  
  
  
  
  
  
  
  
  
  
9. What is the correlation between abortion policy vs Knowledge of Family Planning?
  
  
  
  
  
  
  
  
  
  
10. Pick any two factors from Round 2 that you found interesting & provide your own correlation.