Teaching Activity: Population Dynamics

Introduction: *Population dynamics* is the study of changes in populations in terms of size and makeup. Factors involved in population dynamics include fertility rates, ages of the population, and infant and child mortality. Demographers use this information to make predictions about future population sizes and needs.

Objectives:
- To make predictions analyze the age makeup of different populations;
- To create an age pyramid of the world;
- To evaluate the factors in the environment and in human society that affect the size of the population;

Materials: Student Activity Sheet, colored pencils, pencil / drawing paper;

Procedure:

Part A: Age pyramids are one way to represent the number of people in each age group within a population. The age pyramids below represent the populations of three nations: one growing rapidly (Mexico), one growing slowly (United States) and one that is not growing at all (Sweden).
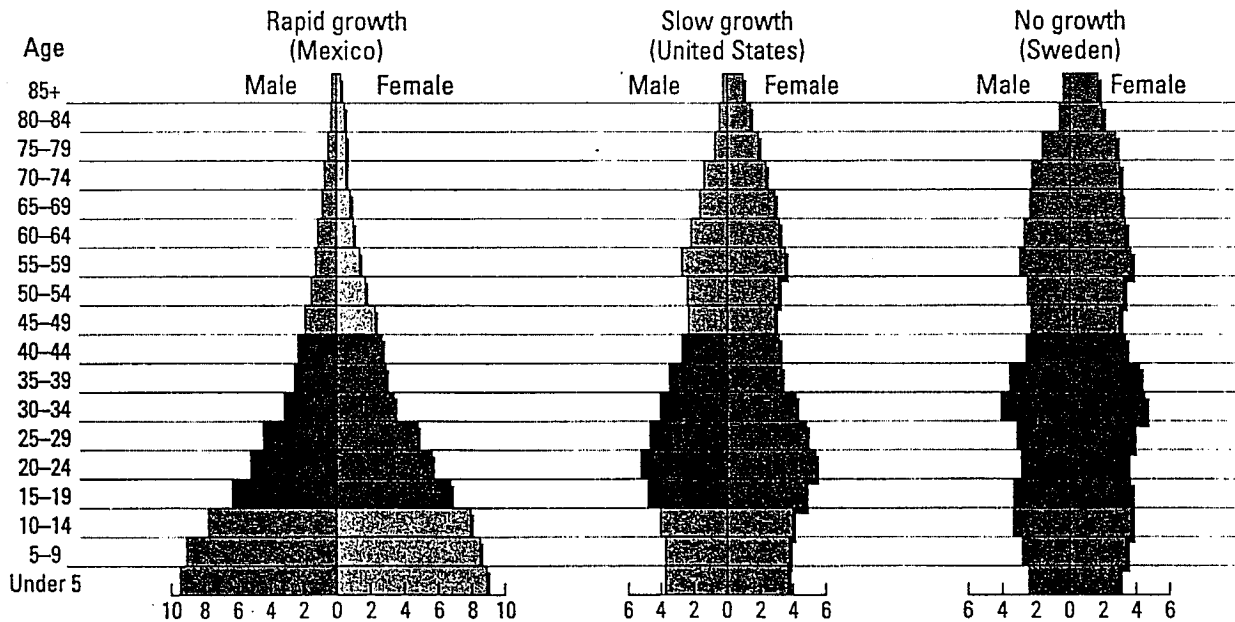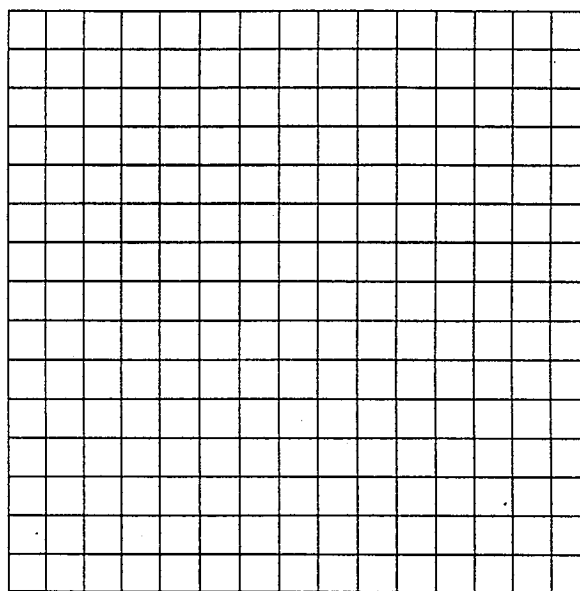

1. Go over the age pyramids with students and help them to analyze the data presented.
   - Ask questions regarding the format of the age pyramids and how they were designed to present the desired information.
   - Instruct students to answer the questions in the analysis section independently.

Part B: A world population pyramid can be created when the population statistics from both the developed and developing nations of the world are combined.
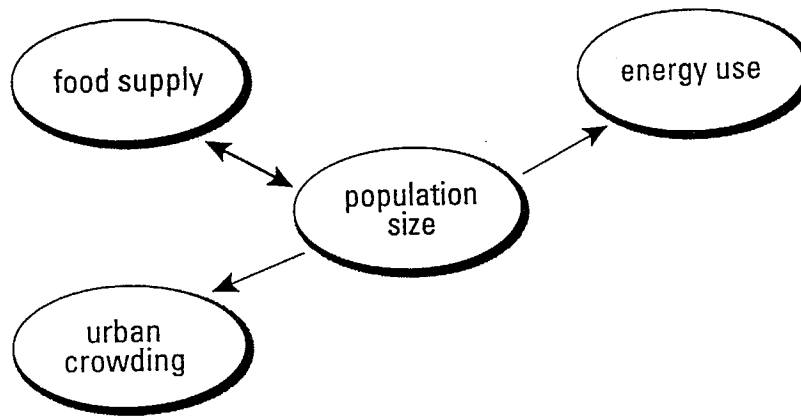
- Using the data presented, students will make an age pyramid of the world in the space provided.

- Before they actually make the pyramid, they should predict which of the three types of growth patterns they expect to find in the world graph.

- Students should answer the questions in the analysis section independently.

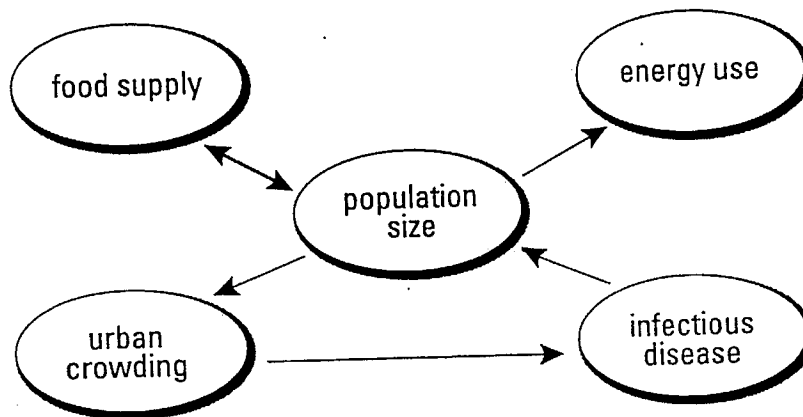**World Population Pyramid (1990), Age/Sex Distribution**

Age Group	% Male	%Female
0-4	6.0	6.0
5-9	5.3	5.2
10-14	5.1	4.9
15-19	5.1	4.7
20-24	4.6	4.4
25-29	4.1	4.1
30-34	3.6	3.5
35-39	3.4	3.2
40-44	2.8	2.7
45-49	2.2	2.1
50-54	1.9	1.9
55-59	1.8	1.8
60-64	1.7	1.7
65-69	1.5	1.6
70-74	0.8	1.0
75+	0.9	1.2

Part C: Many factors in the environment and in human society affect the size of the population. Conversely, the population size affects many aspects of the environment and society. Factors that affect and are affected by population size can be represented in a *connections map.* In a connections map, the central concept, in this case population size, is written in the center of the page with a circle around it. Factors that are *affected by* a changing population are written in a circle and connected to the main idea with an arrow *leading away from* the central circle. Factors that have an *affect on* the population size are represented with an arrow *pointed toward* the central circle. The example below shows the relationship between population size and energy use, food supply and urban crowding. The arrow point both ways from the food supply circle.

Suppose the spread of infectious disease was added as another factor. The connections map would look like this:

On a separate sheet of paper, students should make a connections map of population dynamics. They should include the following factors, as well as any other factors they think are important.

|		
Infant mortality	Habitat destruction	Energy needs
Disease	Birth-control education	Air pollution
Famine	Food supply	Water pollution
Urban crowding	Water supply	Government/politics

Student Activity Sheet: Population Dynamics

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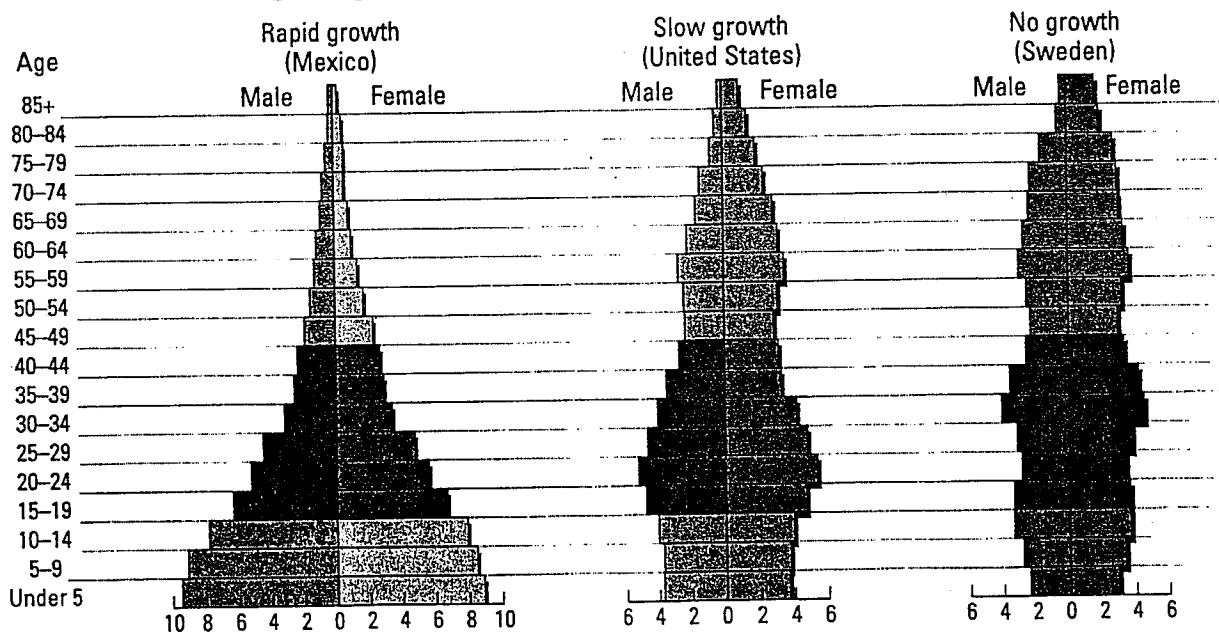

1. Go over the age pyramids with your teacher and be sure that you understand how to analyze the data presented.
- Discuss the format of the age pyramids and how they were designed to present the desired information with your teacher.
- Answer the questions in the **Analysis** section independently.

Part B: A world population pyramid can be created when the population statistics from both the developed and developing nations of the world are combined.
- Using the data presented, make an age pyramid of the world in the space provided.
- Before you actually make the pyramid, predict which of the three types of growth patterns they expect to find in the world graph and write the prediction in the space provided.
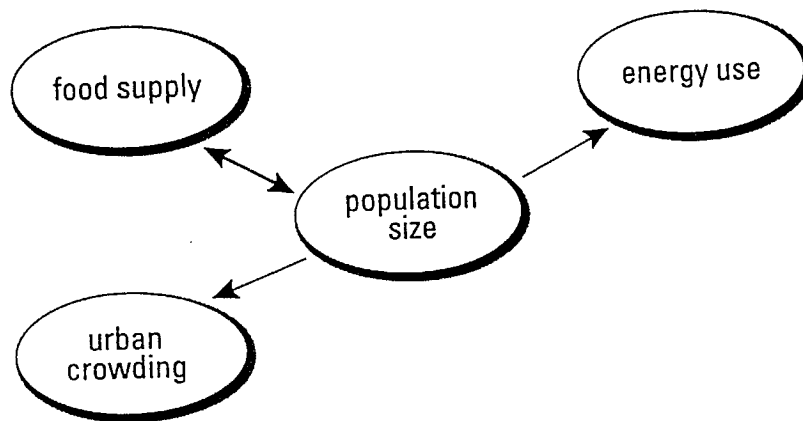
World Population Pyramid (1990), Age/Sex Distribution

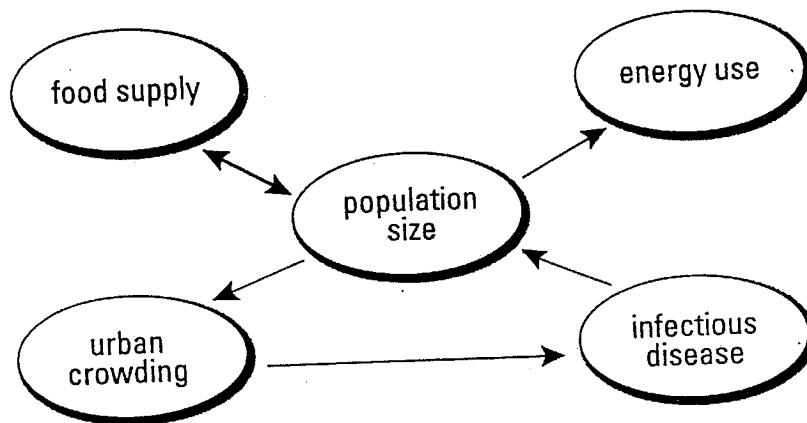| Age Group	% Male	%Female
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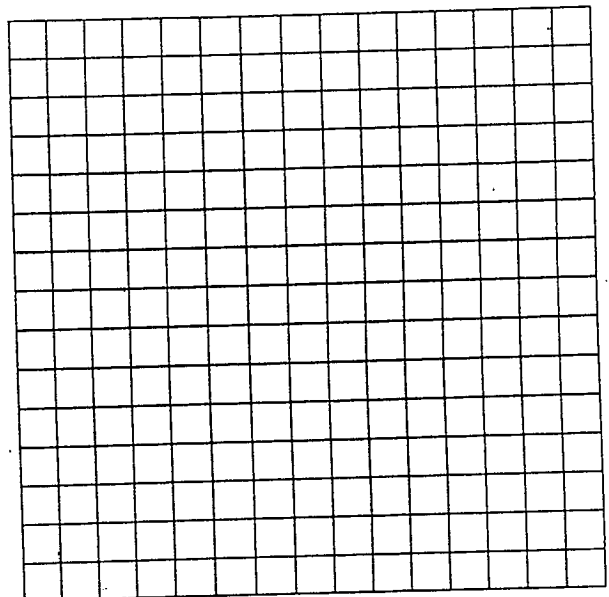
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Famine	Food supply	Water pollution
Urban crowding	Water supply	Government/politics

Student Activity Sheet #1: Population Dynamics

Analysis:
Part A:

1. Which population includes the greatest percentage of people over the age of 65? What percentage of the nation's population falls into that category?

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_____

_____

2. Which nation has the greatest percentage of people in child-bearing years (ages 15-44)? How does the number of people in this category compare to the number of people over 65 in that nation? _____

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Part B:

3. Based on the shape of the world population pyramid, do you think the world population is growing slowly, rapidly, or not at all? _____

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4. Although there are more males than females in the younger age groups, there are more older women than older men. At what age does the number of women worldwide exceed the number of men? Suggest reasons why this might be true. _____

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5. What is the total percentage of people between the ages of 20 and 29? Because there are so many people in this large category, would you expect there to be a greater percentage in the 30-40 year old group 10 years from now? Explain why or why not. _____

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