**Environmental Science Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

 **Period\_\_\_\_\_\_**

**Age Distribution Pyramids**

**Objective:**

To develop an understanding of how to interpret age pyramids and understand the relationship between age structure and population growth.

**Background:**

Population growth is affected by age structure - the number of individuals in different age groups - as well as by the numbers of births and deaths. Age structure is usually illustrated by an age pyramid, a graph in which horizontal bars represent the percentage of the population in each age group. Males are shown on the left and females on the right. The ages (or in some cases, the years of birth) for each bar are listed along the vertical axis of the graph, usually in five-year intervals. Each age group is called a cohort. The longer a bar is, the greater the proportion of individuals in that age group.

Age pyramids are useful for tracing the history of a population and for projecting future population trends. An age pyramid with more long bars for the younger age groups would indicate a growing population; when these large numbers of young begin to reproduce, they will add even more offspring to the population than did the older age groups.

In this activity you and your classmates will collect data on your families and pool the data to produce an age pyramid diagram. This will help you to interpret age pyramids and understand the relationship between age structure and population growth.

**Procedure:**

1. Collect information to complete the "Individual Family Data" in the table below. Find out the birth date and sex of each member of your family, beginning with your grandparents. Include all of the brothers and sisters of your parents and all of the people in your generation, i.e., your brothers and sisters and cousins. If you are not aware of your family background, feel free to construct one or to use that of a friend outside of the class.

2. Pool your data with that of your classmates. Do this by adding your data to the Class Data Table posted in the front of the room. Construct an age pyramid diagram for the class data using graph paper with 5 squares to the inch. You will need to decide how many people are to be represented by one square.

**Data Table:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Age Range | Male | Female | Age Range  | Male | Female |
| <6 |    |   | <6 |   |   |
| 6-10 |   |   | 6-10 |   |   |
| 11-15 |   |   | 11-15 |   |   |
| 16-20 |   |   | 16-20 |   |   |
| 21-25 |   |   | 21-25 |   |   |
| 26-30 |   |   | 26-30 |   |   |
| 31-35 |   |   | 31-35 |   |   |
| 36-40 |   |   | 36-40 |   |   |
| 41-45 |   |   | 41-45 |   |   |
| 46-50 |   |   | 46-50 |   |   |
| 51-55 |   |   | 51-55 |   |   |
| 56-60 |   |   | 56-60 |   |   |
| 61-65 |   |   | 61-65 |   |   |
| 66-70 |   |   | 66-70 |   |   |
| 71-75 |   |   | 71-75 |   |   |
| 76-80 |   |   | 76-80 |   |   |
| 81-85 |   |   | 81-85 |   |   |
| 86-90 |   |   | 86-90 |   |   |
| 91-95 |   |   | 91-95 |   |   |
| 96-100 |   |   | 96-100 |   |   |

**Analysis:**

1. What is the percentage of people under 20? over 60? Is the population a young, growing one; an older, declining one; or a stable one?

2. Is there evidence in the diagram of the baby boom that followed World War II (1946-1964)? If so, is there evidence of the effect of this baby boom in more recent years?

 3. From the class data, determine the average number of children per couple for each generation and compare the averages to the replacement level of 2.1 children per couple. Describe any changes that have occurred in family size over the generations.

 4. How does the pyramid for the class compare to that for the United States? If the United States is now at, or slightly below, the replacement level, why is the population of the country still growing?

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| **Examples of Underdeveloped (Low-income developing)** |
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|  |  |  |
| --- | --- | --- |
| Afghanistan  | Haiti  | Pakistan  |
| Bangladesh  | India  | Papua New Guinea  |
| Benin  | Kenya  | Rwanda  |
| Bhutan  | Korea, Dem Rep.  | Sao Tome and Principe  |
| Burkina Faso  | Kyrgyz Republic  | Senegal  |
| Burundi  | Lao PDR  | Sierra Leone  |
| Cambodia  | Lesotho  | Solomon Islands  |
| Cameroon  | Liberia  | Somalia  |
| Central African Republic  | Madagascar  | Sudan  |
| Chad  | Malawi  | Tajikistan  |
| Comoros  | Mali  | Tanzania  |
| Congo, Dem. Rep  | Mauritania  | Timor-Leste  |
| Congo, Rep.  | Moldova  | Togo  |
| Cote d'Ivoire  | Mongolia  | Uganda  |
| Eritrea  | Mozambique  | Uzbekistan  |
| Ethiopia  | Myanmar  | Vietnam  |
| Gambia, The  | Nepal  | Yemen, Rep.  |
| Ghana  | Nicaragua  | Zambia  |
| Guinea  | Niger  | Zimbabwe  |
| Guinea-Bissau  | Nigeria  |  |

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| **Examples of Developing** |
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|  |  |  |
| --- | --- | --- |
| Albania  | El Salvador  | Namibia  |
| Algeria  | Fiji  | Paraguay  |
| Angola  | Georgia  | Peru |
| Armenia  | Guatemala  | Philippines  |
| Azerbaijan  | Guyana  | Romania  |
| Belarus  | Honduras  | Samoa  |
| Bolivia  | Indonesia  | Serbia and Montenegro  |
| Bosnia and Herzegovina  | Iran, Islamic Rep.  | Sri Lanka  |
| Brazil  | Iraq  | Suriname  |
| Bulgaria  | Jamaica  | Swaziland  |
| Cape Verde  | Jordan  | Syrian Arab Republic  |
| China  | Kazakhstan  | Thailand  |
| Colombia  | Kiribati  | Tonga  |
| Cuba  | Macedonia, FYR  | Tunisia  |
| Djibouti  | Maldives  | Turkmenistan  |
| Dominican Republic  | Marshall Islands  | Ukraine  |
| Ecuador  | Micronesia, Fed. Sts.  | Vanuatu  |
| Egypt, Arab Rep.  | Morocco  | West Bank and Gaza  |

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| **Examples of Developed** |
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|  |  |  |
| --- | --- | --- |
| Andorra  | Greece  | New Caledonia  |
| Aruba  | Greenland  | New Zealand  |
| Australia  | Guam  | Norway  |
| Austria  | Hong Kong, China  | Portugal  |
| Bahamas, The  | Iceland  | Puerto Rico  |
| Bahrain  | Ireland  | Qatar  |
| Belgium  | Isle of Man  | San Marino  |
| Bermuda  | Israel  | Saudi Arabia  |
| Brunei  | Italy  | Singapore  |
| Canada  | Japan  | Slovenia  |
| Cayman Islands  | Korea, Rep.  | Spain  |
| Channel Islands  | Kuwait  | Sweden  |
| Cyprus  | Liechtenstein  | Switzerland  |
| Denmark  | Luxembourg  | United Arab Emirates  |
| Faeroe Islands  | Macao, China  | United Kingdom  |
| Finland  | Malta  | United States  |
| France  | Monaco  | Virgin Islands (U.S.)  |
| French Polynesia | Netherlands  |   |
| Germany  | Netherlands Antilles  |   |

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**Age Pyramid Activity World**

For great population pyramids visit **www.census.gov**, and navigate to the international section, where you can get population pyramids for many different countries, with data from 1995, and projections to 2050.

**Procedure:**

 Access the U.S. Census Bureau Website at: <http://www.census.gov/ipc/www/idb/pyramids.html>

At this site, choose three nations – one that is categorized at underdeveloped, one that is developing, and one that is developed. (See the list for assistance) Use the default settings for the three years 2000, 2025, and 2050, then copy and paste your nine population pyramids to MS *Word.* You may select the “small” graph size option for this activity.

1. Analyzing the pyramids for each of the three countries in turn, discuss how the pyramids vary in the youngest segments of the population:

Underdeveloped: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Developing: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Developed: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

2. Analyzing the pyramids for each of the three countries in turn, discuss how the pyramids vary in the oldest segments of the population:

Underdeveloped: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Developing: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Developed: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

3. What patterns do you see in the differences and changes in the male/female ratios?

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\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

4. Analyze the population pyramids for each of your three countries. Roughly sketch the shape of the “pyramid” for each type of country:

Underdeveloped Developing Developed

5. Using the chart on the following page, mark how you think each event might affect the population of that particular country. Use the following codes:

 Population likely to increase:

 Population likely to decrease:

 Population likely to be unaffected:

 Event unlikely to happen: X

|  |  |  |  |
| --- | --- | --- | --- |
| **Event** | **Developed** | **Developing** | **Underdeveloped** |
| Famine |  |  |  |
| War |  |  |  |
| Lowering of marital age |  |  |  |
| Development of effective birth control |  |  |  |
| Outbreak of cholera epidemic |  |  |  |
| Severe, chronic air pollution |  |  |  |
| Lowering of infant mortality |  |  |  |
| Start-up of a social security system |  |  |  |
| Economic boom |  |  |  |
| Economic depression |  |  |  |
| Legislation of child labor laws |  |  |  |
| More employment opportunities for women |  |  |  |
| More education for women |  |  |  |
| Avian flu epidemic |  |  |  |

**Procedure:**

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