



LESSON PLANS ON AGING ISSUES:
Creative Ways to Meet Social Studies Standards

Global History

THE CHANGING WORLD POPULATION

Ithaca College Gerontology Institute
www.ithaca.edu/aging/schools

(Permission is granted to make copies of this lesson plan for non-commercial, educational purposes.)

Table of Contents

The Changing World Population

Overview	1
Handout: Student Reading and Worksheets.....	5
Completed Graphs for Worksheets	11
Handout: Review Questions.....	23

The Changing World Population

Introduction

One of the most significant demographic changes is an aging world population. The absolute and relative size of the older population is increasing in all world regions. The fastest growth in the aging population is in less-developed regions. This series of activities will demonstrate different patterns of aging for more-developed and less-developed regions. It can be included in high school geography or contemporary issues classes. Since many sections require data analysis, it also can be used in mathematics classes. This lesson should take three to five class periods.

Objectives

Students will:

- Identify demographic differences between more-developed and less-developed regions
- Explain how fertility and mortality rates affect age structure
- List reasons why life expectancy has increased
- Identify ways in which individuals, families, social institutions and governments will be affected by the increased number and proportion of older people
- Define key terms

Materials

Handout: Student Reading and Worksheets

Video: World Population (Zero Population Growth, 2000)

Transparencies:	Fertility Rate by Region	Population Under 14 and Over 60 by Region
	Fertility Rate by Country	Map % Age 65 and over: 2000
	Life Expectancy by Region	Map % Age 65 and over: 2030
	Life Expectancy by Country	Total Population by Country (3 pages)
	Median Age by Region	
	Median Age by Country	

Key Terms

more-developed regions, less-developed regions, age structure, population projections, population pyramid, fertility rate, mortality rate, zero population growth, life expectancy, median age, population density

Lesson Steps

1. Show the video, World Population. This is a seven-minute video showing population growth on this planet during each historical period.
2. Introduce the handouts. The handouts can be presented in sections or as one continuous unit. The following are suggestions for each section of the handout.

Adapted from *Social Studies Classroom Activities for Secondary Schools, Schools in an Aging Society*, State of Connecticut Dept. of Education and Dept. of Aging, 1992.

A. Less-Developed and More-Developed Regions

For discussion:

1. Based on previous studies, what differences, in addition to population density, exist between more-developed and less-developed regions?

B. Population Explosion

For discussion:

1. The number and percentage of older adults in the world are expected to peak around the year 2030. How old will you (teacher and students) be then? How old will your parents be?
2. According to United Nations' projections, the world population may reach 14 billion before leveling off. Some experts estimate peaks between 10 and 11 billion. In either case, population growth is expected eventually to stabilize. In what ways would stable population growth help regions plan for the distribution and production of goods and services?

C. Fertility Rate

Worksheet answers:

1. See completed fertility rate graph on page **11** below.
2. The first noticeable decline in the fertility rate came in 1970.
3. The world fertility rate is influenced more by changes in less-developed regions, since they represent the greatest proportion of the world's population.
4. Based on the projected fertility rate for the upcoming decades, the population increase should level off for more-and less-developed regions. However, this does not take into account changes in the mortality rate due to improved medicine, increased war casualties, or new epidemics or famines.

For discussion:

1. Show fertility rate by country on page **12** below.
2. What are some advantages and disadvantages of lower fertility rates? Of zero population growth? (Lower fertility would mean fewer people competing for natural resources and contributing to overall world pollution. A disadvantage is that fewer working-aged people would be available in the future to provide for older and younger persons. Zero population growth would minimize the strain on finite natural resources.)
3. What public policies do some regions have which encourage lower fertility rates? (Examples: laws forbidding more than one or two children per family, abortion.) What are some ethical, religious, legal and financial issues which governments and families face in promoting lower fertility rates?

D. Life Expectancy

Worksheet answers:

1. See completed life expectancy graph page **13** below.
2. Students may base their answers on general information from other units or courses. For example, they may list car accidents for teenagers, SIDS for young adults, or heart disease for older people as contemporary causes of death. Causes of death in other regions or other times might include malaria, Spanish influenza, typhoid fever, starvation or war.
3. While life expectancy is higher for more-developed regions, the fastest rate of increase is for less-developed regions.
4. Life expectancy for less-developed regions in 1950 was approximately 40 years; for more-developed regions, 65 years. This is a difference of about 27 years.
5. By the year 2010, the difference in projected life expectancy between more- and less-developed regions is about 10 years.
6. Show Life Expectancy at Birth chart by country page **14** below.

For discussion:

1. Make a list of factors that students think might contribute to longer life expectancies (such as decline in wars and famines, better nutrition, medicine, immunization, sanitation, medical technology and safer working conditions). Note that conditions which contributed most to longer life expectancy were improved nutrition, sanitation and medicine (especially vaccinations) which increased the number of persons living through childhood into adulthood. Those improvements extended average life expectancy by decades. Medical technology used with older people extends the average life expectancy by only a few years.
2. For less-developed regions, the average life expectancy increased by 25 years within one generation. Do you think 25 years is a long time? In what ways would a person's life be different if he or she expected to live to age 40 versus 65 or even 85? (Note that a person's perceived life expectancy tends to influence the timing of marriage, childbearing, education, employment and retirement. For example, when people live longer, they usually spend more time working and can plan on having a retirement period.)

E. Median Age

Worksheet answers:

1. See completed graph of Median Age page **15** below.
2. Median age of a family is 58. The average age is 50.
3. The projected median age increase for more-developed regions is from 28.2 in 1950 to 38.6 in 2025.
4. The fertility rate remained high for less-developed regions. This caused the median age to decline. (This question is suitable for small-group discussion, followed by comparisons of response.)

For discussion:

1. Show the chart of median age by country page **16** below.

F. Proportion of Young and Old

Worksheet answers:

1. The percentage of young people starts to decline in less-developed regions after 1970.
2. The percentage of young people starts to decline in more-developed regions after 1960.
3. The under-14 age group is declining at a faster rate in less-developed regions.
4. The percentage of persons over age 60 is increasing in more- and less-developed regions.
5. The rate of increase of over age-60 persons is higher for more-developed regions.
6. By 2010, the proportion of persons over 60 will exceed the proportion of persons under 14 in more-developed regions.
7. Although the number of young persons continues to increase, it does not increase as much as the older population; therefore, the proportion of person under 14 decreases.

For discussion:

1. Review the points covered under median age on the worksheet. Discuss possible effects on young people of having a higher proportion of older than younger persons.
2. Show world maps of Percent Aged 65 and Over for 2000 and 2030 on page **17-18** below.
3. Show table of Total Population by country-for countries of interest beginning on page **19** below.

Extension Activity

Give an example of two imaginary persons. One person grows up in Japan (a more-developed country) but only lives to age 20. The other grows up in Mexico (a less-developed country) but lives to age 90. (Change regions depending on subject and student familiarity.) Describe plausible life courses which would account for why their life expectancies differed from what is average for the region. Include matters of circumstance (such as parent's background) and matters of choice (such as personal initiative). Emphasize that how long a person lives depends greatly on where and when he or she was born. It also depends on life decisions which increase or decrease risks of life. Conclude with suggestions for how students might increase their chances of living longer through good health decisions both now and in the future.

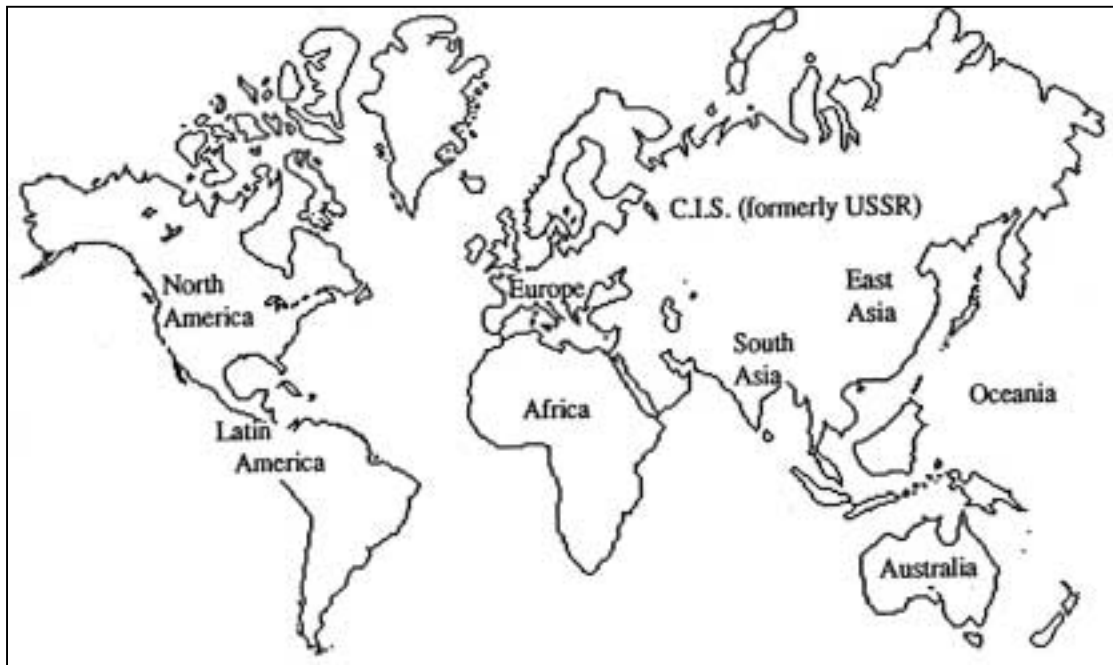
Note: Statistical data in this activity are taken from *Economic & Social Implications of Population Aging*. New York: United Nations, 1988.

Handouts:**Student Reading and Worksheets**

Understanding the distribution of the world population is vital to our understanding of the political and economic issues related to the production and distribution of goods and resources throughout the world. As the total population increases, its characteristics such as age, gender, race and income distribution are changing. This series of lessons focuses on the composition of the world population according to age. It explains why all world regions are experiencing an increase in the number and percentage of older people. Important terms to remember are italicized. This information is important to young people, who will be living in a more dense and older-populated world.

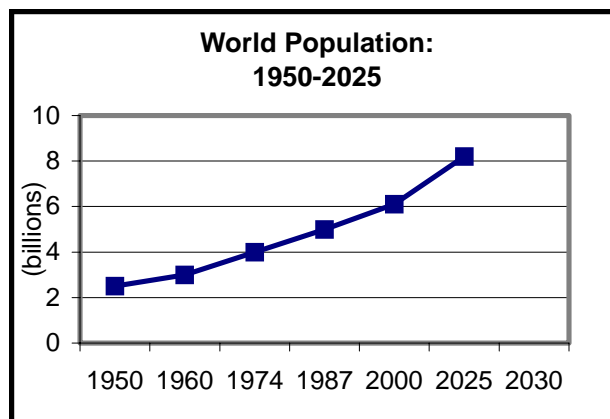
A. Less-Developed and More-Developed Regions

The United Nations classifies regions of the world as *more-developed* and *less-developed* regions. The *less-developed* regions include regions such as Africa, Latin America, East Asia (excluding Japan), South Asia and Oceania (excluding Australia and New Zealand). The *more-developed* regions include regions in Europe and North America, as well as Japan, the former USSR, Australia and New Zealand. Locate these areas on the map below. With a pencil, shade in the area representing less-developed regions.



Notice that the land areas for more-developed regions is about the same as it is for less-developed regions. Although the land area is approximately equal, about one-fourth of the world population lives in the more-developed regions; three-fourths live in the less-developed regions.

B. Population Explosion



The estimated world population in 1950 was 2.5 billion. The total population reached 3 billion in 1960, 4 billion in 1974, 5 billion in 1987, 6.1 billion in 2000 and is projected to reach 8.2 billion in 2025.

In other words, it took the world population over 4,000 years to reach 2 billion, but it will take less than 75 years to quadruple that number. The world population will double between 1975 and 2025, a 50-year period.

What factors influence population growth? The increase in population is determined by the rate of *fertility* (births) and the rate of *mortality* (deaths).

Since more-developed and less-developed regions differ in their fertility and mortality rates, these two types of regions are growing in different ways. Less-developed regions are growing at a faster rate than more-developed regions. More-developed regions are growing at a rate of 0.6 percent per year, while less-developed regions – currently with three-quarters of the world population – are growing at the rate of 2 percent per year. By the 21st century, the less-developed regions will hold an estimated four-fifths of the world population.

A significant trend in the changing demographics of the world is *population aging*. Both the number and percentage of older people are increasing at a rapid rate. In fact, older people currently make up a higher percentage of the total world population than at any time in history. This trend will continue until approximately 2030.

The increase in the proportion of older people is the result of the relative decline in fertility and mortality. Decline in fertility, along with decline in mortality, results in smaller proportions of young people compared to older age-groups who are living longer. So, as the population gets older, its age structure changes. *Age structure* refers to the proportion of different age groups within a population.

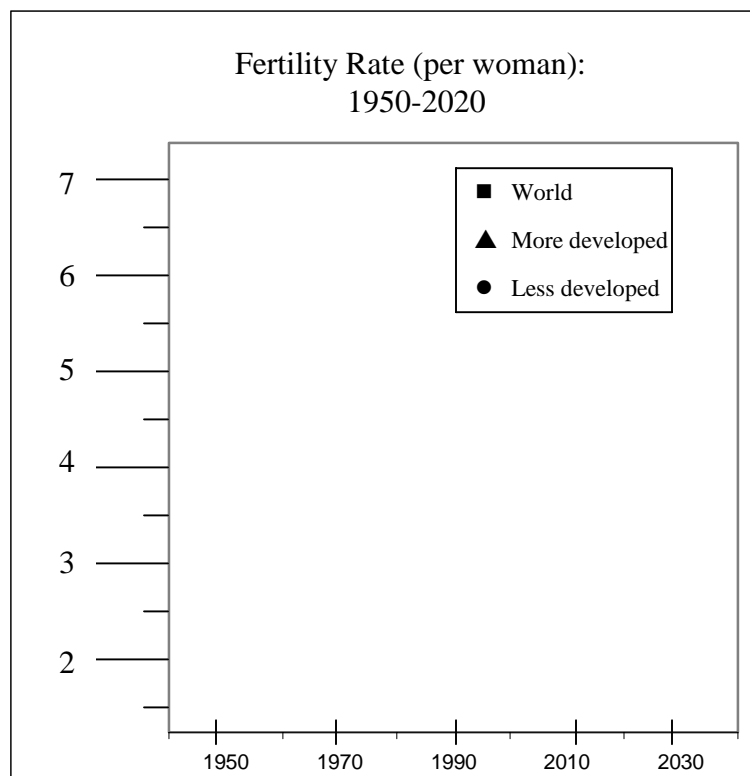
The charts in exercise C show changes in fertility and mortality rates for more- and less-developed regions.

C. Fertility Rate

- Using the chart below, draw a line graph comparing the fertility rate of the world, more-developed regions and less-developed regions.

Total Fertility Rates (per woman)

Year	World	More-Developed	Less-Developed
1950	4.9	2.8	6.1
1960	5.0	2.7	6.1
1970	4.4	2.2	5.4
1980	3.5	2.0	4.1
1990	3.1	2.0	3.4
2000	2.8	2.0	3.0
2010	2.6	2.1	2.7
2020	2.4	2.1	2.4



- In what year does the fertility rate for both more- and less-developed regions take its first noticeable decline?

- Why does the world fertility rate follow more closely the course of less-developed regions than more-developed regions?

- Assuming no changes in the mortality rate, the world would achieve zero population growth if the fertility rate were maintained at approximately 2.1 children per woman. According to the projected fertility rate for the next few decades, does it appear that the world might be able to slow the population increase by controlling the fertility rate? Explain. _____

D. Life Expectancy

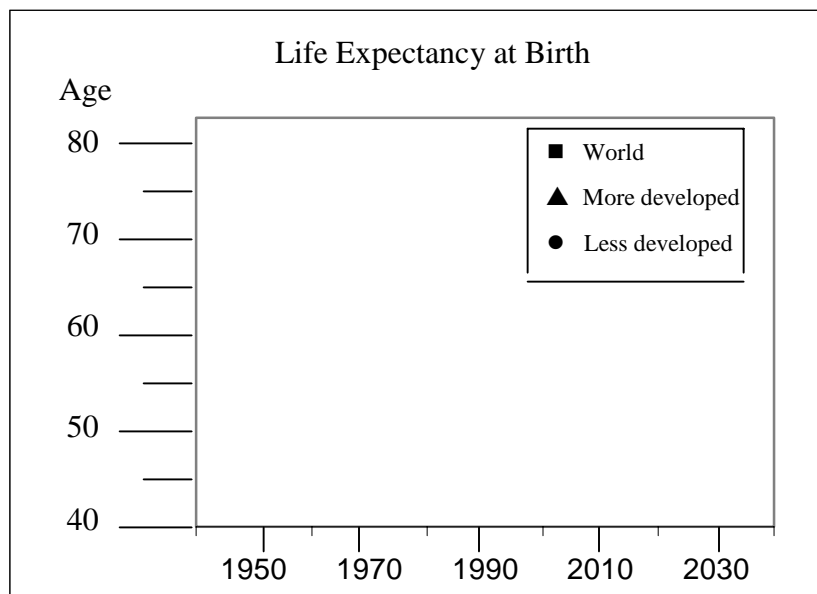
Life expectancy refers to the average length of time people can be expected to live. Ancient African Tribes, Greek city-states and colonial America all had individuals who lived into their 70s, 80s and even 90s. What has changed is that many more people today live to old age due to improved sanitation, better nutrition and increased immunization from childhood diseases.

1. In the first column list three common causes of death for different age-groups today in the United States. In the second column, list three causes of death common during other historical times or geographical settings, but less common today.

_____	_____
_____	_____
_____	_____

2. Using the chart below, draw a line graph comparing the life expectancy of the world, more-developed regions and less-developed regions (see below for completed graph).

Year	World	More-Developed	Less-Developed
1950	46.0	65.8	41.1
1960	51.5	69.7	47.5
1970	56.6	71.3	54.1
1980	59.5	73.1	57.3
1990	62.6	74.8	60.8
2000	65.4	75.9	63.9
2010	67.9	76.7	66.7
2020	70.5	77.2	69.5



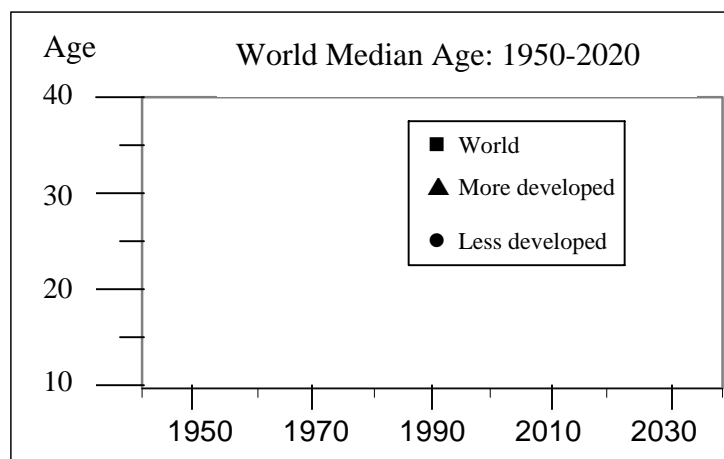
3. Which region (more-developed or less-developed) has experienced the fastest rate of change in life expectancy? _____
4. What is the approximate difference between the life expectancy for more-developed and less-developed regions in 1950? _____
5. What is the approximate difference between the projected life expectancy for more- and less-developed regions in 2010? _____

E. Median Age

Median is the middle number in a given sequence of numbers. So *median age* is the age at which half the population is over and half is under. For example, in a four-generation family whose members are ages 81, 66, 58, 35, 32, 10, 6, 5 and 2, the median age is 32. The average age is 32.8.

1. What is the median age of a family whose members are ages 81, 78, 66, 58, 35, 32 and 2? ____
What is the average age? _____
2. Using the chart below, draw a line graph comparing the median age of the world, more-developed regions and less-developed regions (see below).

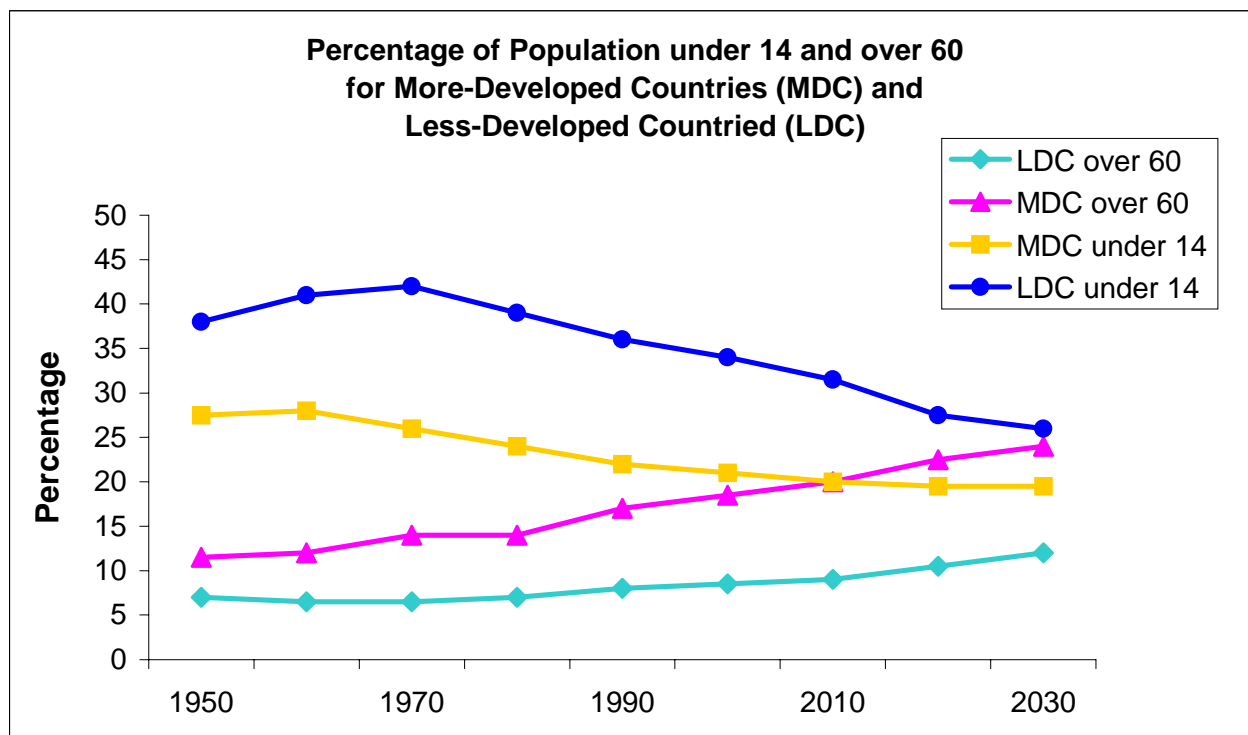
Year	World	More-Developed	Less-Developed
1950	23.4	28.2	21.2
1960	22.7	29.2	20.0
1970	21.6	30.2	19.0
1980	22.6	31.4	20.0
1990	24.4	33.6	22.2
2000	26.5	35.1	24.5
2010	28.3	37.6	26.5
2020	31.2	38.6	29.9



3. According to projections, the rate of increase in births is expected to be less than the rate of declines in deaths between 1980 and 2020. The large number of persons born in previous years are getting older and the number of children in future years is not expected to increase as rapidly. This trend causes the median age in more-developed regions to increase from the median age of ____ in 1950 to the projected median age of ____ in 2020.
4. Based on the fertility and life expectancy charts, how would you explain why-between 1950 and 1970-the median age increased for more-developed regions and decreased for less-developed regions?
5. How might conditions be different as the age structure changes, with more older people and fewer young people? On notebook paper, give at least two changes you foresee in the following areas: (a) hospitals, (b) schools, (c) businesses, (d) restaurants, (e) recreation, (f) television (g) clothing. (Example: transportation: longer lights for crosswalks at intersections; fewer red sports cars.)

F. Proportion of Young and Old

The graph below illustrates significant changes in the age structure of more-developed and less-developed countries. Answer the questions below, based on information found on the graph.

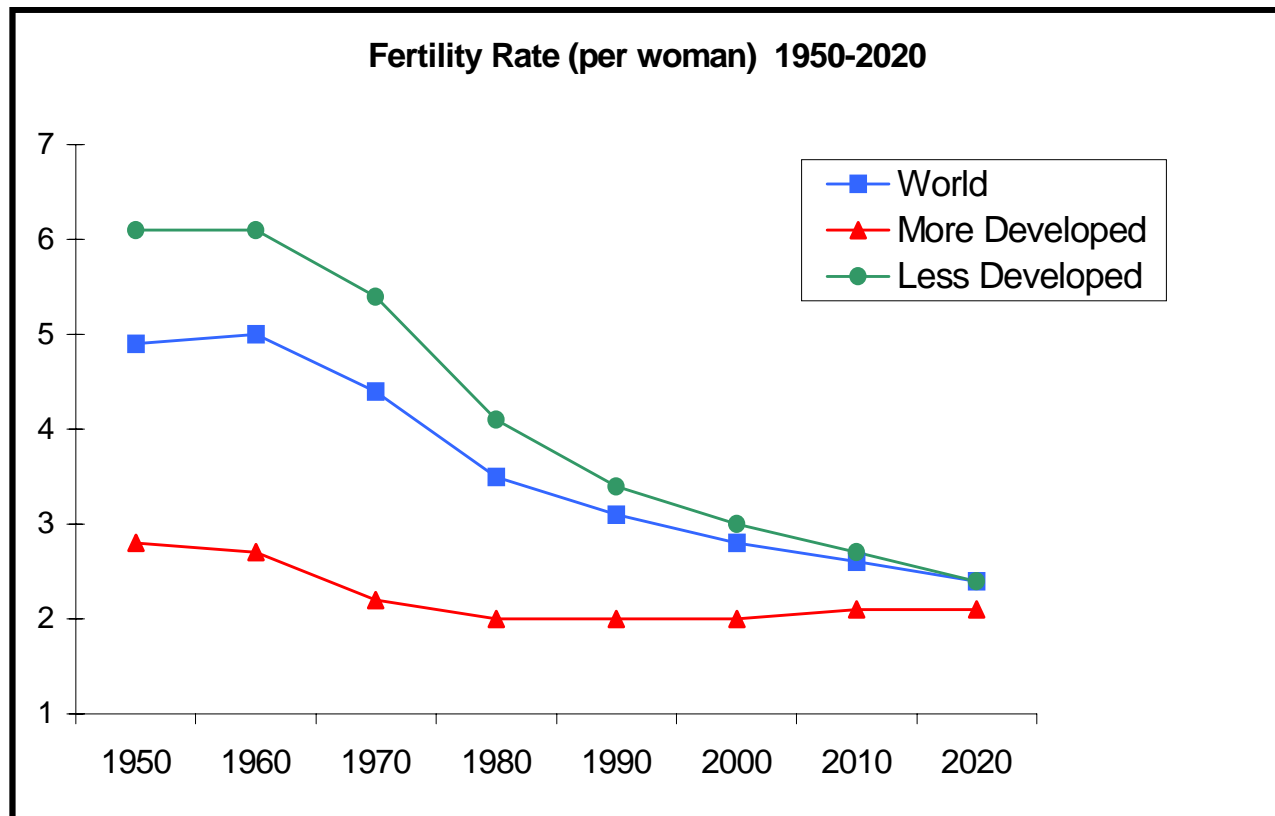


1. After what year does the percentage of young people start to decline in less-developed countries (LDCs)? _____
2. After what year does the percentage of young people start to decline in more-developed countries (MDCs)? _____
3. In which regions does the under-14 age group decline at a faster rate – MDCs or LDCs? _____
4. What happens to the percentage of persons over 60 for both MDCs and LDCs? _____
5. In which countries is the rate of increase of persons over 60 higher between 1980 and 2010 – MDCs or LDCs? _____
6. What happens in MDCs to the proportion of people under 14 compared to the proportion over 60?

7. During the period between 1950 and 2010, the total *number* of persons under 14 increases but, as shown on the graph above, the *proportion* of persons under 14 decreases. Explain.

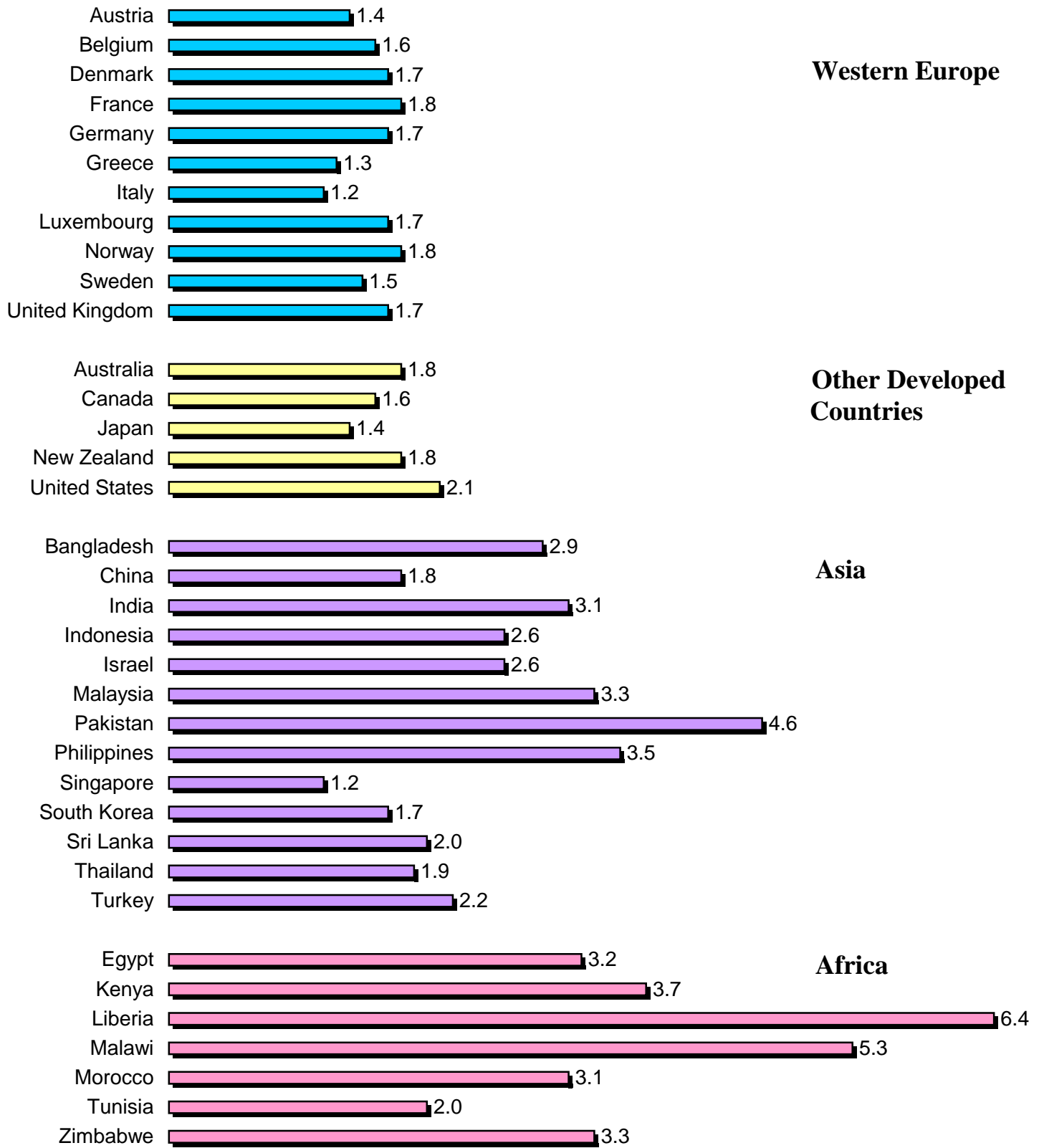
Completed Graphs for Worksheets

Fertility Rate by Region



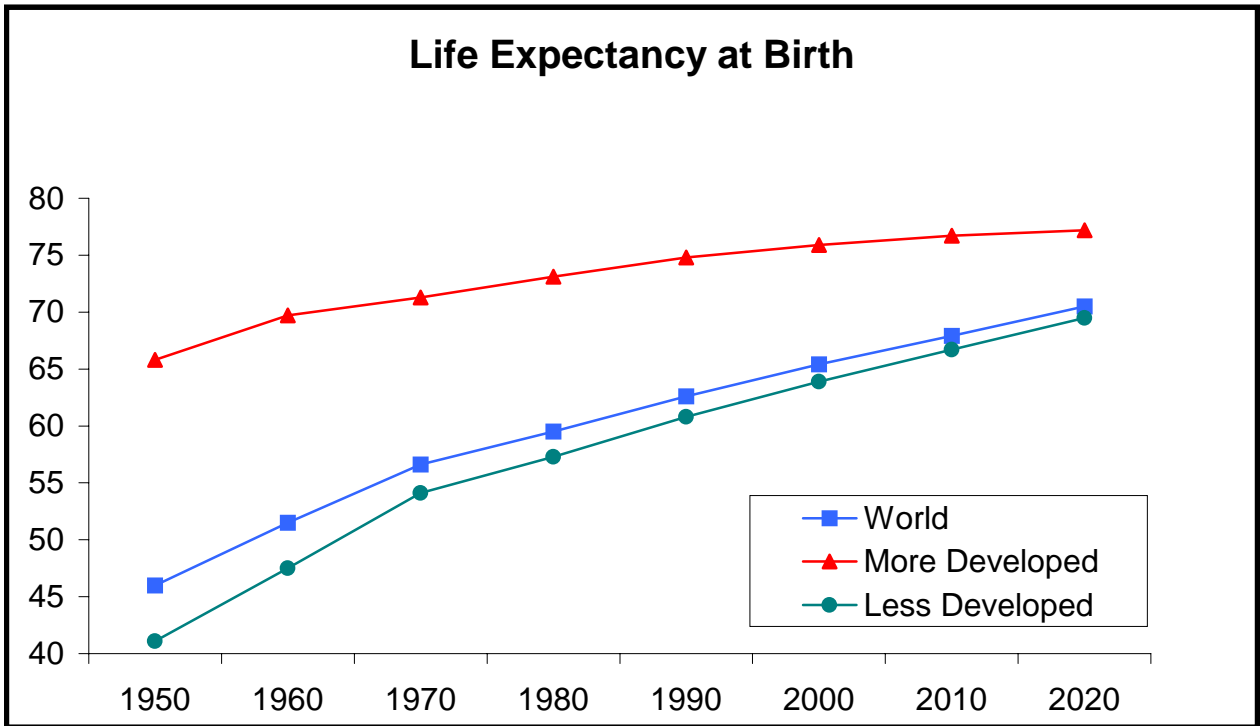
From *Social Studies Classroom Activities for Secondary Schools, Schools in an Aging Society*, State of Connecticut Dept. of Education and Dept. of Aging, 1992.

Fertility Rate by Country: 2000 (Births per woman)



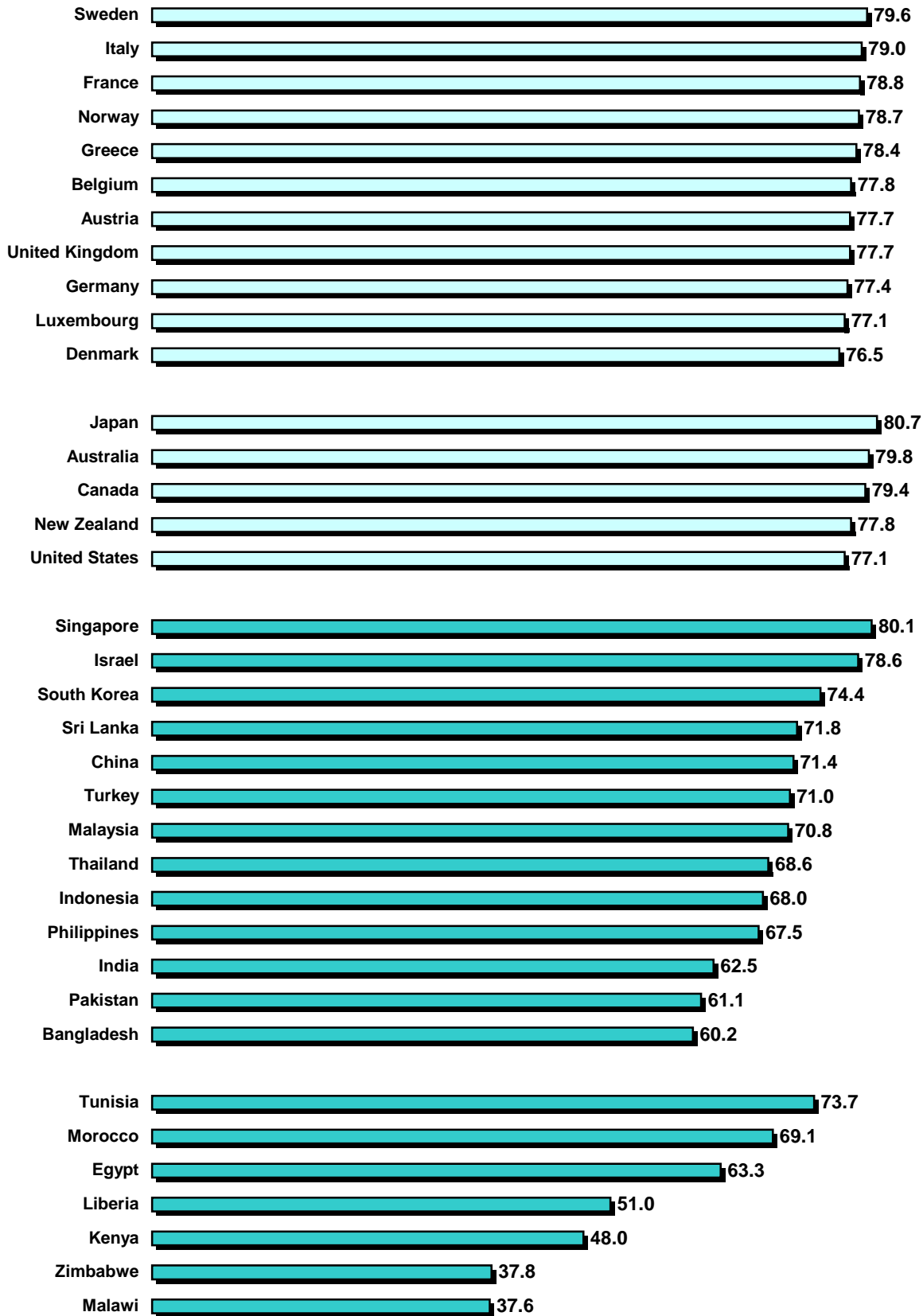
Source: *An Aging World: 2001*, U.S. Census Bureau, 2000a

Life Expectancy by Region



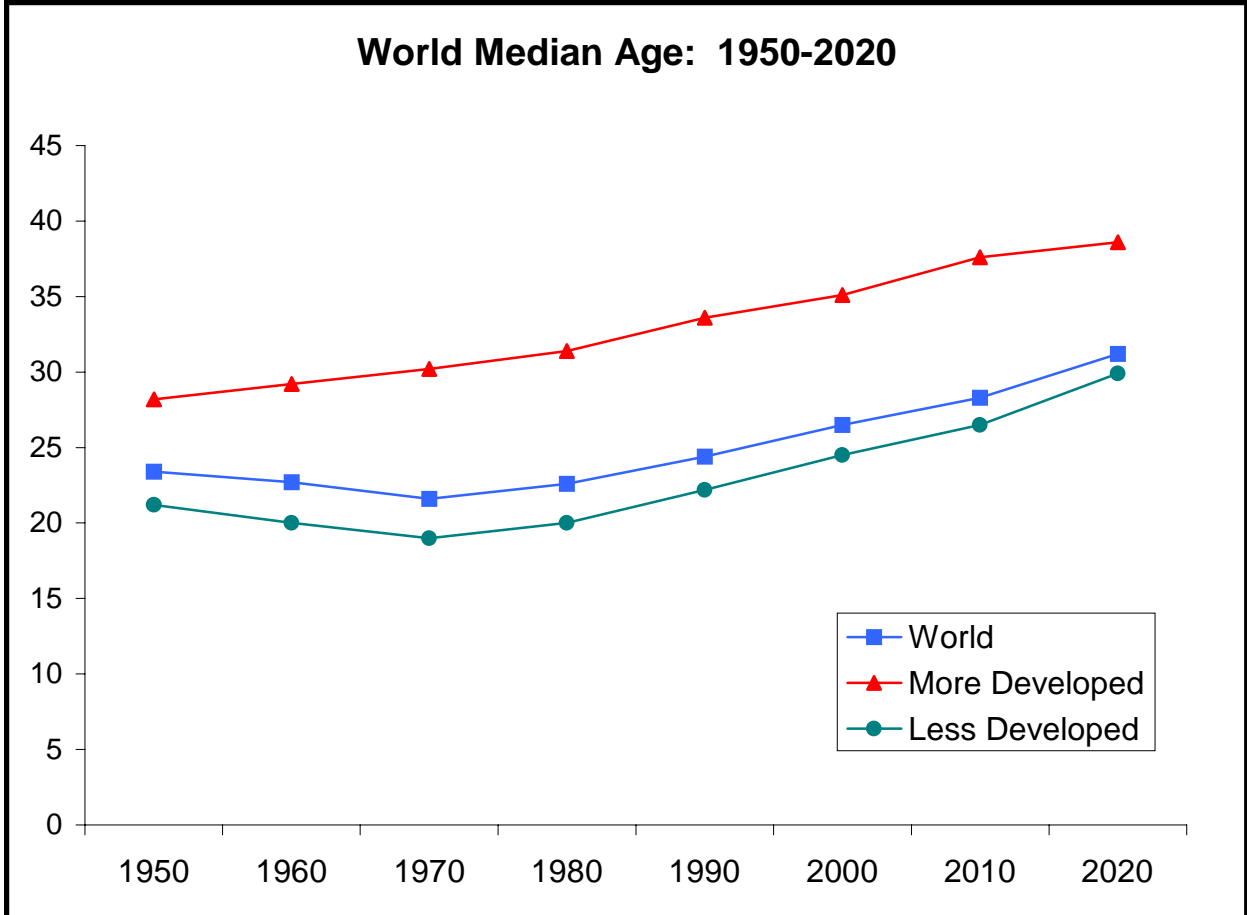
From *Social Studies Classroom Activities for Secondary Schools, Schools in an Aging Society*, State of Connecticut Dept. of Education and Dept. of Aging, 1992.

Life Expectancy at Birth by Country: 2000 (in years)



Source: [An Aging World: 2001](#), U.S. Census Bureau, 2000a

World Median Age by Region



From *Social Studies Classroom Activities for Secondary Schools, Schools in an Aging Society*, State of Connecticut Dept. of Education and Dept. of Aging, 1992.

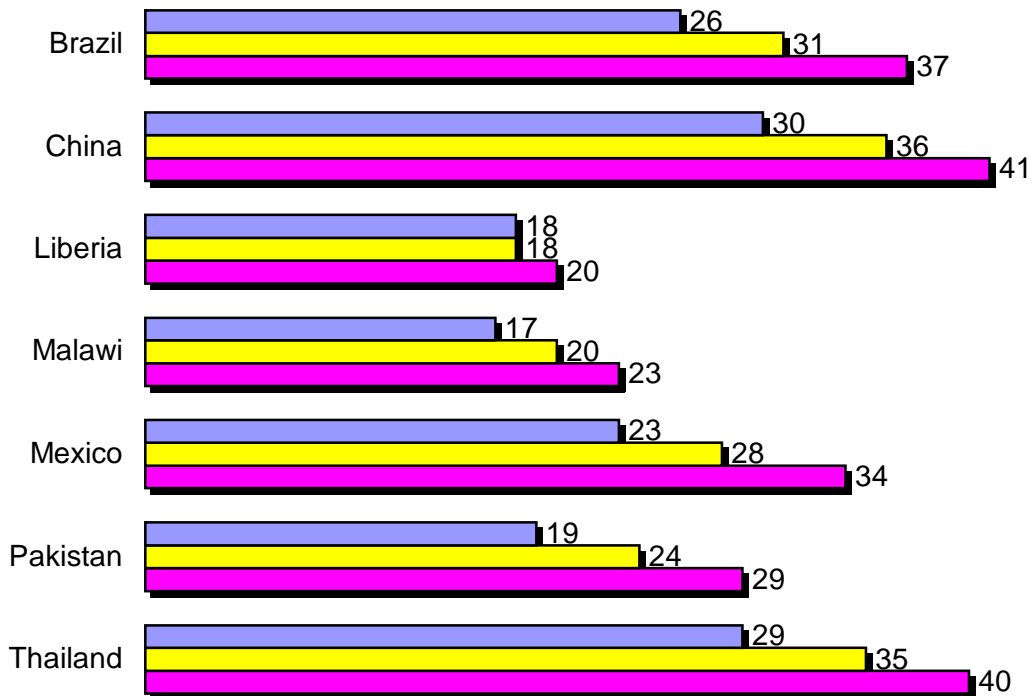
Median Age in 12 Countries: 2000, 2015, and 2030 (in years)



Developed Countries

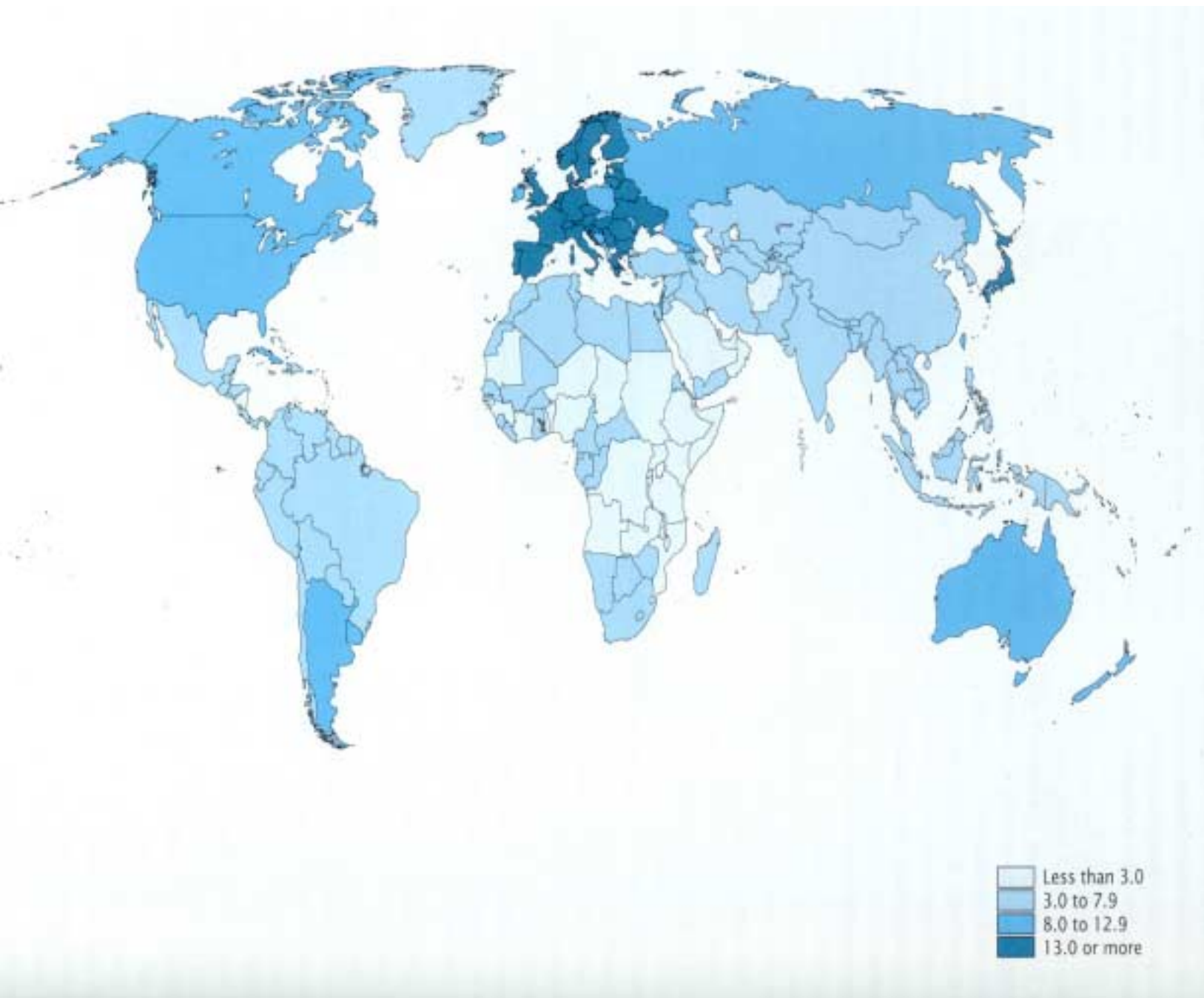


Developing Countries



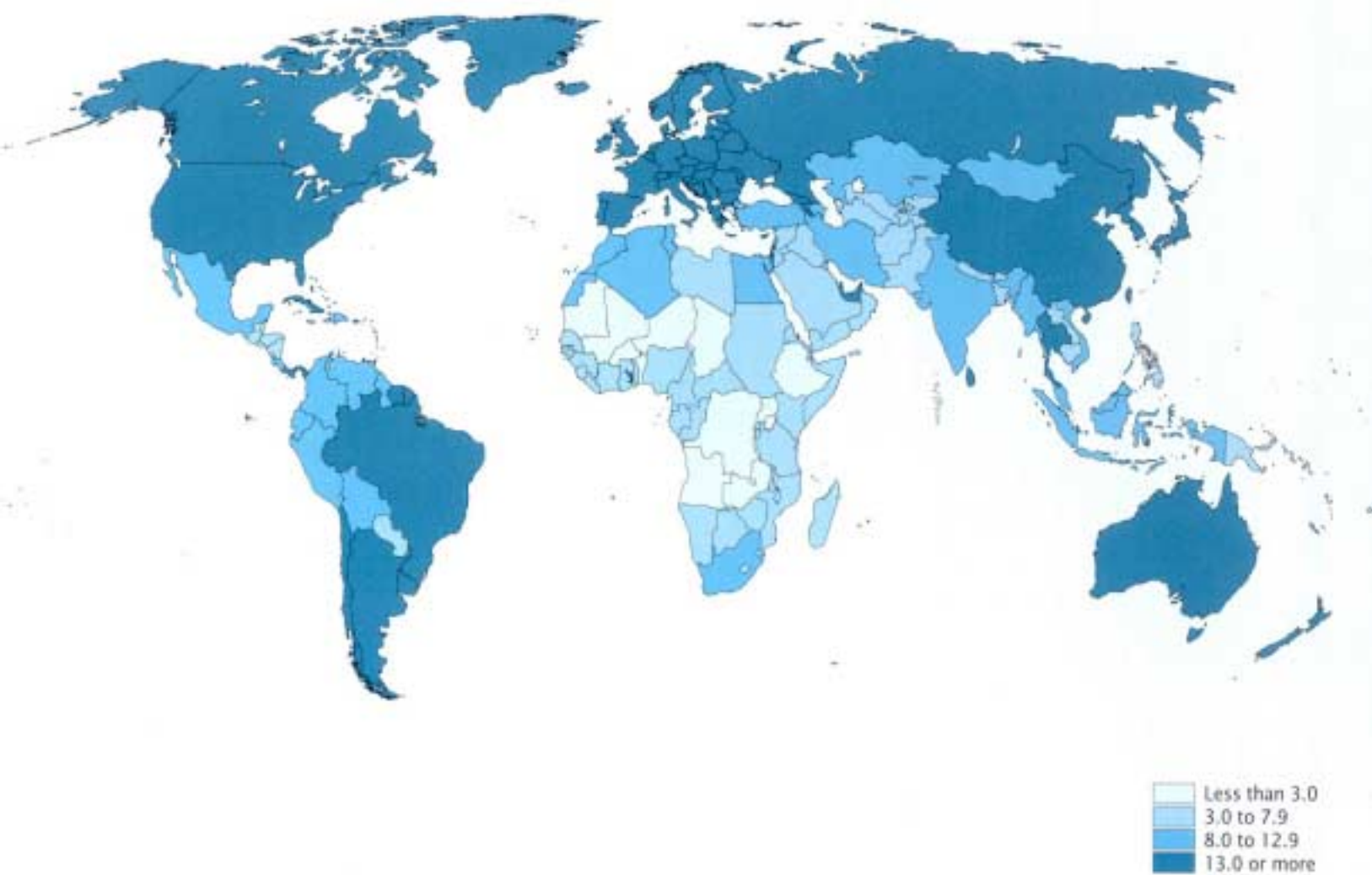
Source: *An Aging World: 2001*, U.S. Census Bureau, 2000a.

Percent Aged 65 and Over: 2000



Source: *An Aging World: 2001*, U.S. Census Bureau, 2000a.

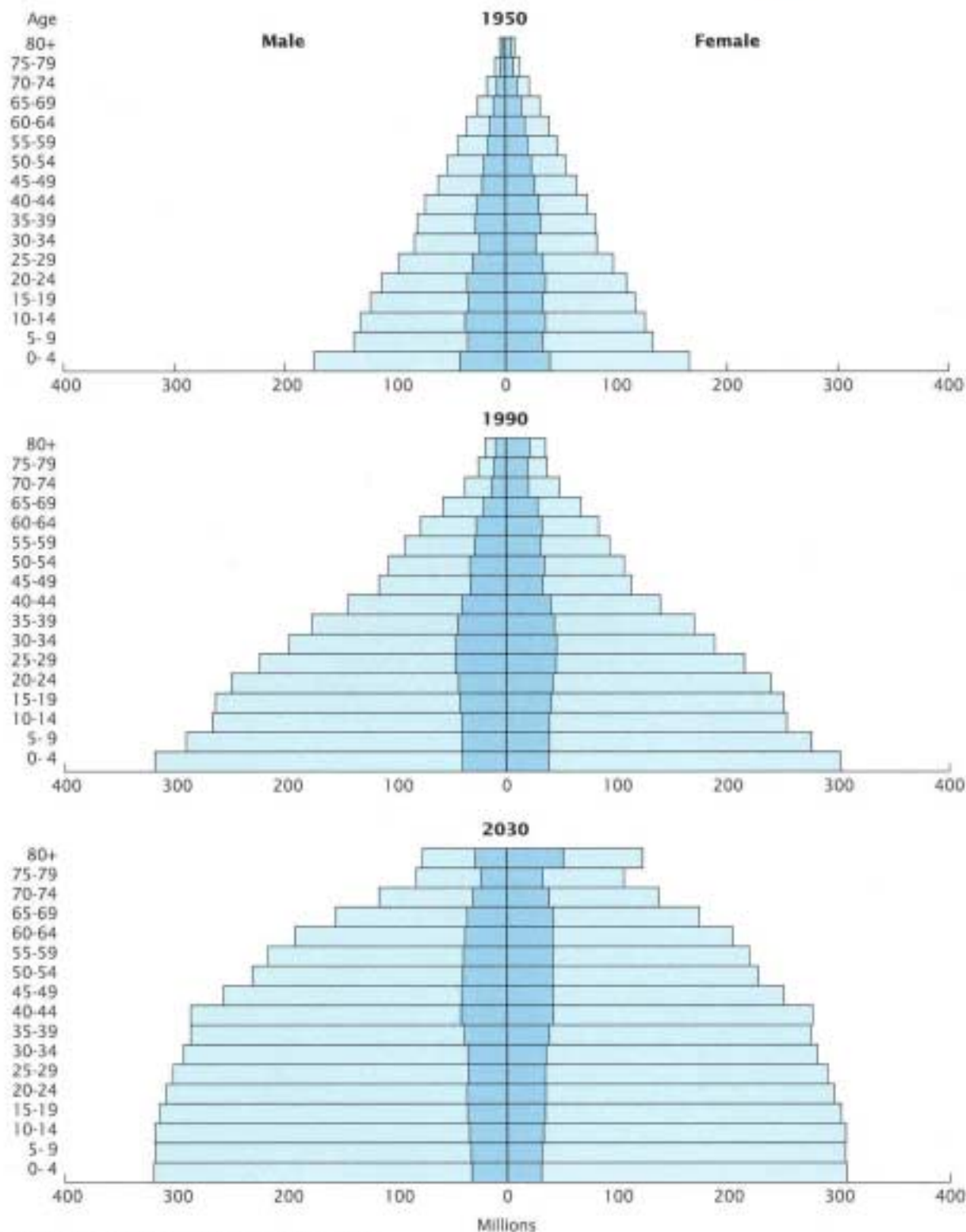
Percent Aged 65 and Over: 2030



Source: *An Aging World: 2001*, U.S. Census Bureau, 2000a.

Population by Age and Sex: 1950, 1990, and 2030

Developing countries
 Developed countries



Sources: United Nations, 1999 and U.S. Census Bureau, 2000e.

Total Population – Western Europe
Percent Elderly 2000 and Projected for 2030
(in thousands)

Country	2000			2030		
	Total population	% 65+	% 80+	Total population	% 65+	% 80+
Austria	8,131	15.4	3.4	8,278	25.2	7.0
Belgium	10,242	16.8	3.5	10,175	25.4	7.3
Denmark	5,336	14.9	4.0	5,649	23.0	7.1
France	59,330	16.0	3.7	61,926	24.0	7.5
Germany	82,797	16.2	3.5	84,939	25.8	7.2
Greece	10,602	17.3	3.5	10,316	25.4	7.8
Italy	57,634	18.1	4.0	52,868	28.1	9.0
Luxembourg	437	14.0	3.0	580	19.8	5.2
Norway	4,481	15.2	4.4	5,018	22.0	6.6
Sweden	8,873	17.3	5.0	8,868	25.1	8.6
United Kingdom	59,508	15.7	4.0	61,481	23.5	7.0

Source: *An Aging World: 2001*, U.S. Census Bureau, 2000a.

Total Population – Asia
Percent Elderly 2000 and Projected for 2030
(in thousands)

Country	2000			2030		
	Total population	% 65+	% 80+	Total population	% 65+	% 80+
Bangladesh	129,194	3.3	0.5	184,478	7.2	1.0
China	1,261,832	7.7	0.9	1,483,121	16.0	2.9
India	1,014,004	4.6	0.6	1,437,103	9.0	1.4
Indonesia	224,784	4.5	0.4	312,592	10.9	1.7
Israel	5,842	9.9	2.4	7,873	14.9	3.9
Japan	126,550	17.0	3.7	116,740	28.3	11.1
Malaysia	21,793	4.1	0.5	35,306	9.4	1.6
Pakistan	141,554	4.1	0.5	226,251	6.5	0.9
Philippines	81,160	3.6	0.5	129,448	7.7	1.2
Singapore	4,152	6.8	1.5	9,047	14.8	3.0
South Korea	47,471	7.0	1.0	53,763	19.5	4.2
Sri Lanka	19,239	6.5	1.0	22,937	15.2	3.1
Thailand	61,231	6.4	0.9	71,311	16.4	3.1
Turkey	65,667	6.0	0.9	84,195	12.9	2.4

Source: *An Aging World: 2001*, U.S. Census Bureau, 2000a.

Total Population – Africa
Percent Elderly 2000 and Projected for 2030
(in thousands)

Country	2000			2030		
	Total population	% 65+	% 80+	Total population	% 65+	% 80+
Egypt	68,360	3.8	0.4	99,583	8.0	1.1
Kenya	30,340	2.7	0.4	34,836	5.2	1.1
Liberia	3,164	3.4	0.6	6,745	4.2	1.0
Malawi	10,386	2.8	0.3	12,817	3.2	0.6
Morocco	30,122	4.6	0.7	44,664	9.1	1.4
Tunisia	9,593	6.0	0.8	12,322	12.7	2.3
Zimbabwe	11,3431	3.5	0.5	9,086	6.4	1.8

Source: *An Aging World: 2001*, U.S. Census Bureau, 2000a.

Name: _____

Teacher: _____

Period: _____

Global History

Review Questions: The Changing World Population

1. Identify two demographic differences between more-developed and less-developed countries.

2. Explain how fertility and mortality rates affect age structure.

3. List two reasons why life expectancy has increased.

4. Identify three ways in which societies will be affected by the increased number and proportion of older people.

(OVER)

Choose **five** terms from the list below. For each of the five terms, write a definition and two related facts.

More developed regions
 Less developed regions
 Age structure
 Population projections
 Fertility rate

Mortality rate
 Zero population growth
 Life expectancy
 Median age
 Population density

Term	Definition	Two Facts
1.		<hr/> <hr/> <hr/> <hr/> <hr/>
2.		<hr/> <hr/> <hr/> <hr/> <hr/>
3.		<hr/> <hr/> <hr/> <hr/> <hr/>
4.		<hr/> <hr/> <hr/> <hr/> <hr/>
5.		<hr/> <hr/> <hr/> <hr/> <hr/>