

Section

4.2

Human Population

North Carolina Objectives Objective 5.03 Assess human population and its impact on local ecosystems and global environments: Historic and potential changes in population; Resource use

► Before You Read

This section discusses human population. What words come to mind when you hear the term *human population*? Think about some of the concepts you learned in the previous section. Do they apply to human populations? Write your thoughts on the lines below.

► Read to Learn

STUDY COACH

Mark the Text

Identify the

Main Point Skim the section and highlight the main idea of each paragraph.

World Population

A census, which counts all the people who live in a country, is taken every ten years in the United States. It also collects information about where people live and their economic condition. The United Nations keeps similar information for each country in the world. The study of information about human populations is called **demography** (de MAH gra fee). Information about populations includes size, density, distribution, movement, birthrates, and death rates.

Human population has grown at a rapid rate in recent years. Scientists estimate that it took from the time of the first humans to 1800 for the world human population to reach 1 billion. In 1930, there were 2 billion people. In 1999, there were 6 billion people. If this rate continues, scientists estimate that in 2050 there will be 9 billion people on Earth.

What factors affect the growth of human populations?

Remember that populations can keep growing as long as they have enough resources. Human populations are different from other populations because humans can consciously change their environment. Humans can grow their own resources by farming and raising farm animals. Humans can control limiting factors such as disease. Many illnesses that killed people in the past can now be treated with medicine. People live longer and they are able to produce more children. The children grow up and they produce more children, causing the population to grow. ☺

✓ Reading Check

- How are humans different from other populations?

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Human Population, continued**How can you determine the growth rate of a population?**

To determine the growth rate of a population, you need to consider different factors. Those factors are illustrated in the chart below.

Factors that Add to a Population	Factors that Subtract from a Population
Births	Deaths
People moving into a population	People moving out of a population

The **birthrate** is the number of live births per 1000 people in a given year. The **death rate** is the number of deaths per 1000 people in a given year. Keeping track of people who move into and out of a population is not always possible. As a result, it is easier to use the birthrate and death rate to calculate the Population Growth Rate (PGR). The following formula is used to calculate PGR:

$$\text{Birthrate} - \text{Death Rate} = \text{Population Growth Rate}$$

When the birthrate of a population is the same as the death rate, then the PGR is zero. It is important to remember, though, that if the PGR is zero, it does not mean that the population is remaining exactly the same. It means that new people are entering the population (through birth) at the same rate that people are leaving the population (through death). The population is changing, but it is stable. Your school population will help you understand this idea. If new students arrive at the same rate that students graduate, the population of your school remains the same even though the students that make up the population change each year.

What is the effect of a positive growth rate?

When the PGR is above zero, or positive, it means that more people are entering the population than are leaving. The population is growing. The PGR is positive when there are more births than deaths in the population. A PGR also can be less than zero, or negative. This happens when there are more deaths than births.

Doubling time is the time needed for a population to double in size. Doubling only happens with growing populations. A negative growth rate means that a population will not double. A slow growth rate means that it will take a long time for the population to double. Doubling time can be calculated for a population.

**Think it Over**

- Interpret** If the population growth rate is positive it means there are (Circle your choice.)
 - more births than deaths.
 - more deaths than births.

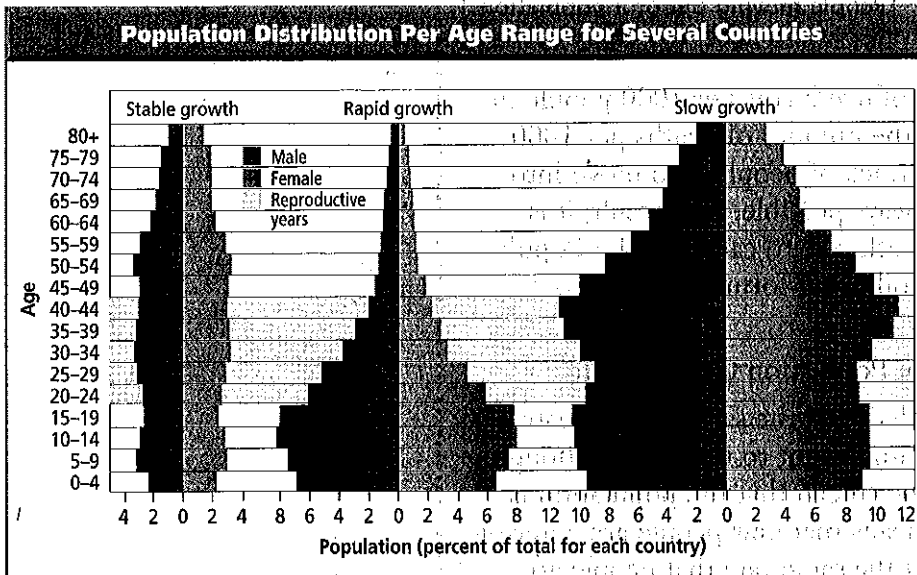
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Human Population, continued

What is the age structure of a population?

You may have filled out a survey that asked if you were between the ages of 10 and 14 or between the ages of 15 and 19. Your answer tells where you are in the age structure of the population. **Age structure** refers to the number of people at each different age level. Scientists are interested in the ages of the population, and how many people are males and how many are females. This information tells the scientists if the population is stable, growing, or becoming smaller.

Scientists put age information into a graph called an age structure graph. The graph shows at a glance the ages of the largest group in the population. When a large amount of the population is made up of children, then the population is experiencing rapid growth. When there are more adults than children, the population is declining. When the amount of people in the different age levels is about equal, the population is stable.



Think it Over

- 3. Interpret a Graph** In the age structure graph above, which country has the smallest percentage of people in the 80+ age group? (Circle your choice.)
- a. stable growth country
 - b. rapid growth country
 - c. slow growth country

Does environment affect population growth?

The needs of human populations are different all over the world. Some are concerned with basic needs such as food and water. Some need to maintain the healthy conditions they already have. Sometimes populations grow too fast. In these populations, there is not enough food, water, or living space for everyone. Maybe the population creates more waste than can be handled. Sometimes the conditions of the environment cause disease to spread, or pollution affects the water. These things affect the stability of human populations. The environment plays an important part in the growth of populations.

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Human Population, continued**► After You Read****Mini Glossary**

age structure: proportions of a population that are at different age levels

birthrate: number of live births per 1000 population in a given year

death rate: number of deaths per 1000 population in a given year

demography (de MAH gra fee): study of population characteristics such as growth rate, age structure, and geographic distribution

doubling time: time needed for a population to double in size

1. Review the terms and their definitions in the Mini Glossary above. Circle the four key terms that scientists use to gather important information about a population.
2. Use the table below to review what you have read. Place each of the characteristics from the list that follows the table under the correct heading.

Increasing Population	Decreasing Population

Will not have doubling time

Positive growth rate

More adults than children

More children than adults

Will have doubling time

Negative growth rate



Visit the Glencoe Science Web site at science.glencoe.com to find your biology book and learn more about human population.