

APES: DEMOGRAPHIC FACTS OF LIFE ACTIVITY (From Earth Matters)

PART I: Doubling Time

Birth and death rates determine the rate of population growth. If the birth and death rates are similar, a population experiences little or no growth. When the birth rate far exceeds the death rate, the population soars. These rates are expressed as the number of births or deaths for every 1,000 people in a given year. For instance, in 1998 the world's birth rate was 23 per 1,000 and the death rate was 9 per 1,000. Using the formulas below, we can determine the world's annual growth rate and the number of years it will take the population to double if the growth rate remains constant.

$$\% \text{ annual natural increase} = \frac{\text{birth rate} - \text{death rate}}{10}$$

$$\frac{23 - 9}{10} = 1.4\%$$

$$\text{doubling time (in years)} = \frac{70}{\text{rate of increase}}$$

$$\frac{70}{1.4\%} = 50 \text{ years}$$

PROCEDURE: Fill in Student Worksheet 1 and answer the discussion questions below.

Student Worksheet #1

Country	Birth Rate in 1998 (per 1000 people)	Death Rate in 1998 (per 1000 people)	% Annual Natural Increase	Doubling Time (in Years)
China	17	7		
India	29	10		
Iraq	38	10		
Italy	9	9		
Japan	10	7		
Kenya	38	12		
Mexico	27	5		
Russia	9	14		
South Africa	27	12		
United Kingdom	13	11		
United States	15	9		

DISCUSSION:

- 1) Why do you think some countries are doubling much more rapidly than others?

Why do you think some countries, such as Italy, have reached zero population growth?

- 2) Which figures differ most greatly between countries, the birth rates or the death rates?

How would you explain the wide disparity in birth rates among different countries?

Why are death rates relatively low in many countries with high birth rates?

- 3) If you were a national leader in Kenya or Iraq, would you be concerned about the rapid population growth? Why or why not?

Similarly, if you were national leader in Italy, would you be concerned that your country has reached zpg? Why or why not?

- 4) The population of the U.S. is actually growing at the rate of about 1 percent each year, more than its rate of natural increase. Where is the additional population growth coming from?

Part II: Grim Reaper's Revenge

Conveying the importance of population figures can be difficult since the numbers are so large they lose their meaning. Fill in the chart below to be amazed!

Below is a listing of some of the world's worst disasters, along with an approximate death toll. At today's present rate of growth, determine how many days, weeks, or months (depending on the time frame) it would take to replace those lost. Round off to one decimal place.

We are currently adding 84 million people (net growth) to the world each year, or 229,000 people each day.

Some past disasters	Approximate # of deaths	Present world population growth replaces this # in approximately what time span?
All U.S. accident deaths, 1995	93,300	
Bangladeshi cyclone, 1991	140,000	
Total American deaths in all wars	600,000	
Great flood, Hwang Ho River, 1887	900,000	
Total U.S. automobile deaths through 1995	2,600,000	
India famine, 1769-70	3,000,000	
Total AIDS dead through 1996	6,400,000	
China famine, 1877-78	9,500,000	
Influenza epidemic, 1918	21,000,000	
Global deaths in all wars in the past 500 years	35,000,000	
Bubonic plague, 1347-51	75,000,000	

This assignment was adapted from an activity Mary Beth Kircher and Sam Rhee of Bryn Mawr School.