

300,000,000! IN THE USA

Concept:

The population of the U.S. is growing, but how fast is it growing? What are the implications of population growth? To understand the pace of population growth, it is helpful for students to be able to derive and track our growth rate.

Objectives:

Students will be able to:

- Explain how populations change as birth and death rates vary.
- Determine the rate at which U.S. population is growing, using basic demographic data.
- Compare growth rates in the U.S. to the European Union and the world as a whole.
- Relate how this information affects their community.

Subjects:

Social Studies, Math

Skills:

Calculating, measuring and dividing units of time

Method:

Students multiply ratios, divide units of time, and subtract death rates from birth rates to calculate population growth rates.

 Population

 Quality of Life

USA Population Clock

Introduction

Population scientists, or demographers, use data on birth and death rates to compare countries and to understand how populations change in size. The following questions allow students to use this data to determine the rates at which the populations of the U.S. and the European Union are growing.

Materials:

Student Worksheets
Calculators

Procedure:

1. Distribute the Student Worksheets. Explain to the class that in this activity they will be using demographic data to determine the rate at which our population is growing. This growth rate, or “natural increase,” is found by subtracting the death rate from its birth rate. (Natural increase does not include migration. If the death rate is greater than the birth rate, the population growth rate will be negative.)
2. You may wish to discuss as a class how students will work with these large numbers on their calculators.
3. Each student should calculate the population clock for the United States and the European Union, or EU, following the directions on the student worksheet. The two make an interesting comparison because of similarities in population size (USA: 300,000,000; EU: 456,953,258) and economy (USA GDP: \$12,370,000,000,000; EU GDP: \$12,180,000,000,000) At present, the EU includes 25 countries, the largest of which are Germany, France, Italy, Spain, and Poland. Before students begin, ask them to make some conjectures about how growth in the USA might compare to the EU, and why. They may list their results in the space provided.
4. Once students have completed their clocks, and have the correct answers, display the Answer Key. Note that students' answers may vary slightly due to rounding.

Discussion Questions:

1. Which region has more births per minute?

The EU does, with 8.69 births/minute vs 8.07 births/minute in the USA.

2. Which region is growing faster? Which is likely to remain the smaller of the two regions?

The USA is adding more people. If current trends continue, the USA will grow to include more people than the European Union sometime in the later half of the 21st Century.

3. What might account for the difference in growth rates between the USA and EU?

The birth rate in the USA is 40% higher than in the EU, because our average family size is larger.

4. The clock shows the EU population slowly declining. What might be causing this to happen?

In the EU, the death rate is higher than the birth rate — more people die than are born. This is because average family size is low – less than two children per couple.

5. The world as a whole features a much higher birthrate than either the USA or the EU (20.15 per thousand, compared with 8.25 and 10.1 per thousand, respectively). Why do you suppose this is the case?

Most population growth is happening in the poorest nations in the world. The USA and the EU together represent many of the wealthiest nations in the world. The poorer, developing nations elevate the worldwide average for birth rate. These countries have higher birth rates in part due to the greater incidences of infant mortality due to poor health care and sanitation. When parents are not sure their children will survive, they are more likely to have a larger family. In some places, children also provide labor and may earn income for the family instead of going to school, which also leads to larger families.

6. Are exactly 8.07 people born each minute in the USA?

No, that number is an average. At any given second, it is impossible to know precisely how many people are being born.

7. Other than birth and death, are there any other ways that the population of a country can change?

Yes, people can migrate to and from countries.

8. Many of the more developed nations now have population growth rates that are very low, so their populations may actually decrease over time. What are some of the challenges and benefits such a situation may present to a nation?

People in more developed countries tend to use more natural resources per capita than people in less developed countries, so the world environment will benefit from smaller populations in these countries. Citizens of these countries may worry that their social security systems and medical care for the elderly may be stressed by the larger proportions of the citizenry in the older age brackets and fewer people of working age.

Source:

CIA World Factbook, www.cia.gov/cia/publications/factbook

Answer Key:

1. Birth and Death Rates

Region	World	United States	European Union
<i>Population in 2006</i>	6,446,000,000	300,000,000	457,000,000
<i>Birth Rate (per 1000)</i>	20.15	14.14	10
<i>Births per year</i>	129,886,900	4,242,000	4,570,000
<i>Death Rate (per 1000)</i>	8.78	8.25	10.1
<i>Deaths per year</i>	56,595,880	2,475,000	4,615,700

2. Births

Region	World	United States	European Union
<i>Births per year</i>	129,886,900.00	4,242,000.00	4,570,000.00
<i>Month</i>	10,823,908.33	353,500.00	380,833.33
<i>Week</i>	2,497,825.00	81,576.92	87,884.62
<i>Day</i>	355,854.52	11,621.91	12,520.55
<i>Hour</i>	14,827.27	484.25	521.69
<i>Minute</i>	247.12	8.07	8.69

3. Deaths

Region	World	United States	European Union
<i>Deaths per year</i>	56,595,880.00	2,475,000.00	4,615,700.00
<i>Month</i>	4,716,323.33	206,250.00	384,641.67
<i>Week</i>	1,088,382.31	47,596.15	88,763.46
<i>Day</i>	155,057.21	6,780.82	12,645.75
<i>Hour</i>	6,460.72	282.53	526.91
<i>Minute</i>	107.67	4.71	8.78

4. Natural Increase

Region	World	United States	European Union
<i>Natural Increase per year</i>	73,291,020.00	1,767,000.00	-45,700.00
<i>Month</i>	6,107,585.00	147,250.00	-3,808.33
<i>Week</i>	1,409,442.69	33,980.77	-878.85
<i>Day</i>	200,797.31	4,841.10	-125.20
<i>Hour</i>	8,366.55	201.72	-5.22
<i>Minute</i>	139.45	3.36	-0.09

Name _____

Date _____

Student Worksheet, Page 1
USA Population Clock

1. Calculate the number of births per year for the United States and the European Union, using population and birth rate. Express the total population in thousands by dividing it by 1000. Multiply this by the birth rate to calculate the births per year. Follow the same process to find the deaths per year, using population and death rate.

Example: worldwide births per year:

$(\text{World population}/1,000) * (\text{Births per 1000})$

Plugging in data, we get:

$(6,446,000,000/1000) * (20.15)$ or $(6,446,000) * (20.15)$ which equals 129,886,900 births per year.

Region	World	United States	European Union
<i>Population</i>	6,446,000,000	300,000,000	457,000,000
<i>Birth Rate (per 1000)</i>	20.15	14.14	10
<i>Births per year</i>	129,886,900		
<i>Death Rate (per 1000)</i>	8.78	8.25	10.1
<i>Deaths per year</i>	56,595,880		

2. Calculate the births per month, week and day using the figure for births per year from Question 1. Calculate the hour and minute using the births per day figure. Round your answer to two decimal places.

1 year = 12 months

1 year = 52 weeks

1 year = 365 days

1 day = 24 hours

1 hour = 60 minutes

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<i>Births per year</i>	129,886,900.00		
<i>Month</i>	10,823,908.33		
<i>Week</i>	2,497,825.00		
<i>Day</i>	355,854.52		
<i>Hour</i>	14,827.27		
<i>Minute</i>	247.12		

Name _____

Date _____

Student Worksheet, Page 2
USA Population Clock

3. Find the death rates following the same process as in Question 2.

Region	World	United States	European Union
<i>Deaths per year</i>	56,595,880.00		
<i>Month</i>	4,716,323.33		
<i>Week</i>	1,088,382.31		
<i>Day</i>	155,057.21		
<i>Hour</i>	6,460.72		
<i>Minute</i>	107.67		

4. The natural increase per unit of time can be found by subtracting deaths from births. For example, subtract the deaths per year in the U.S. from the births per year to find the natural increase per year. Do the same for months, weeks, and the rest of the time periods.

Region	World	United States	European Union
<i>Natural Increase per year</i>	73,291,020.00		
<i>Month</i>	6,107,585.00		
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<i>Day</i>	200,797.31		
<i>Hour</i>	8,366.55		
<i>Minute</i>	139.45		