Launch
The United States government - like local, state and national governments around the world - does lots of counting. Government agencies make hundreds of census counts every year. They keep track of jobs and unemployment, automobiles, accidents, animals, illnesses, forests, and farmlands. Every ten years, the U.S. census bureau counts every American citizen.

Think About This Situation
The population of our world changes rapidly - in ten years it will grow by over one billion people.

a. What are some of the major factors that might influence population change in a country?
b. Why doesn't the U.S. Census Bureau make a complete count of the population every five years or every year?
c. Why would it be important to know year-to-year population changes, and how you could estimate those changes without a full census survey?

Investigation 1: People Watching (Explore)
Brazil is the largest country in South America, with a 1990 population of about 145 million people. Census statisticians can estimate the population of Brazil from one year to the next using small surveys and the following facts about patterns of change.

Population Change in Brazil
- Based on recent trends, births every year equal about 2.6% of the total population.
- Deaths every year equal about 0.7% of the total population.
- The net change due to births and deaths is an increase of 1.9% each year.

Working with your group, use these facts to predict information about Brazil's population in the future.

1. What is the predicted change in Brazil's population by 1991 due to:
   a. births?  
   b. deaths?  
   c. all causes combined?

2. Use your answers from problem 1 to discuss the following:
   a. Explain why the net population change due to births and deaths is an increase of about 1.9% each year.
   b. What is the predicted total Brazilian population in 1991?

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**Population Change in the U.S.**
The 1990 United States census report said that there were then 248 million residents in the fifty states and territories. Before the ink was dry on that report, the actual population had changed. So the Census Bureau makes annual estimates of the change based on current trends.

- Births every year will equal about 1.6% of the total population.
- Deaths every year will equal about 0.9% of the total population.
- Immigrants from other countries will add about 0.9 million people each year.

4. If the 1990 population was 248 million, what is the predicted change in population by 1991 due to:
   a. births and deaths?  
   b. immigration?  
   c. all causes combined?

5. What is the predicted total U.S. population in 1991?


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7. Describe the pattern of change in the U.S. population as time passes and compare that pattern to the change in Brazil's population.
Checkpoint  *(Share and Summarize)*

In population studies of Brazil and the United States, you made estimates for several years in the future, based on growth trends from the past.

a. What calculations are needed to estimate population growth from one year to the next in the two different countries?

b. Using the word *NOW* to stand for the population of the United States in any year, write an expression that shows how to calculate the population in the *NEXT* year.

Be prepared to compare your expression relating *NOW* and *NEXT* with those of other groups.

**On Your Own (Individual Assessment)**

a. Write an expression using *NOW* and *NEXT* that shows how to use the population of Brazil in one year to calculate the population in the next year.

b. If the birth rate in the United States increased to 2.6%, like Brazil, how would that change the population increase from one year to the next for the U.S.? Find the predicted 1991 population.