

Name: _____ Date: _____ Period: _____

Human Population Growth and Carrying Capacity

Step 1- Create Human Population Growth Graph

Directions: Use the following data to graph the human population starting in the year 1650. Scale the x-axis from years 1650 through 2050, and the y-axis from 0 to 8 billion people. Make sure that you 1) label your axis, 2) scale the axes so that it uses most of the graph, 3) plot the points, 4) draw a best-fit line; and 5) provide a title for your graph. Use graph paper on the last page!

Step 2- Answer Analysis Q's after creating the graph.

1. It took 1,649 years for the world population to double from .25 billion people to .50 billion people.

- How long did it take for the population to double a second time? _____
- How long did it take for the population to double a third time? _____
- How long did it take for the population to double a fourth time? _____

2. According to this information, the human population has increased / decreased (circle one) at a decelerated / accelerated rate (circle one).

3. Based on your graph, in what year will the population reach 8 billion? _____

Year A.D.	Number of People (in billions)
1650	.50
1750	.70
1850	1.0
1925	2.0
1956	2.5
1970	3.6
1980	4.4
1991	5.5
2000	6.0
2004	6.4
2008	6.7
2011	6.9

Step 3 Read the following section: Earth's Carrying Capacity

Prior to 1950, the death rate was high, which kept the numbers of humans from increasing rapidly. In the 19th Century, the agricultural revolution increased food production. The industrial revolution improved methods of transporting food and other goods. In the 20th Century, advances in medicine, sanitation and nutrition have decreased the death rates further. These factors combined to produce the rapid growth of the human population in the 20th century.

As with any population, humans are also **limited by factors** such as space, amount of food and disease. The **carrying capacity** is the number of individuals that a stable environment (earth) can support. Authorities disagree on the maximum number of people that the earth can support, though the numbers generally range for 8 to 10 billion. As the population approaches its limit, starvation will increase. Some countries have a much higher growth rate than others. **Growth rate** is the number of people born minus the number of people that die. For bonus, find the growth rates of 3 different countries.

Most countries are trying to reduce their growth rate. Zero population growth means that as many people are being born as there are dying - to achieve zero population growth, each couple would need to have no more than two children (to replace the parents). Even if this number is achieved, the population will continue to grow because the parents will still live on for decades, as their children have children and their children have children... and so forth. The United States reached zero population growth in the 1980's, and yet the overall population of the US still increases.

Step 4 Answer Questions based on reading

5. What limiting factors contributed to the world's overall population growth in the last 150 years?

6. Why does a population not level off during the same year it reaches zero population growth?

7. If the carrying capacity of the earth was 9 billion people, when would this number be reached (according to your graph)?

8. What will happen when the human population exceeds the earth's carrying capacity?

9. Based on what you have learned about human population and carrying capacity, what prediction(s) would you make about the future of the human population?

