

Unit 3 Populations APES Exam Review

Population Math



- 1) Write an equation for the rule of 70: _____. What is it used for?
- 2) Perform the following calculations: (Show all of your work in a logical progression to the final answer.)
 - a. A city has a population of 50,000 in 2012. If the population of the city grows at an annual rate of 2%, the year in which the population will reach 100,000 is _____ and the year it will reach 200,000 is _____.
Show work:
 - b. A country's population was 12 million in 1992 and in 2012 it is 24 million. If the population grew at a constant rate, that percent rate of growth was _____.
Show work:
 - c. Perform the following calculation. Show all of your work. In a particular year a population has the following characteristics: the crude birth rate is 45, the crude death rate is 20, the immigration rate is 1%, and the emigration rate is 0.5%. The percent rate of growth for that year is _____.
Show work:

Population Changes and Population Momentum

- 3) What are the four factors used to determine population growth? What is the equation?
- 4) From the equation in #3, what factors add organisms to a population? Which ones remove organisms from a population?
- 5) What is population momentum?

R vs K Selected Species

- 6) List two characteristics of an r-selected species.
 - a) _____
 - b) _____
- 7) List two characteristics of a K-selected species.
 - a) _____
 - b) _____
- 8) A Whooping Crane is a _____ (r or k selected species) and it is endangered because of the following:
- 9) A California Condor is a _____ (r or k selected species) and it is endangered because of the following:
- 10) An Orangutan is a _____ (r or k selected species) and it is endangered because of the following:
- 11) A Dodo was a _____ (r or k selected species) and it is extinct because of the following:

Exponential and Logistic Growth, Carrying Capacity

- 12) Use the axes to the right for the following:
 - a) Draw and label a line that represents linear growth.
 - b) Draw and label a line that represents exponential growth.
 - c) Draw and label a line that represents logistic growth. Label the carrying capacity.

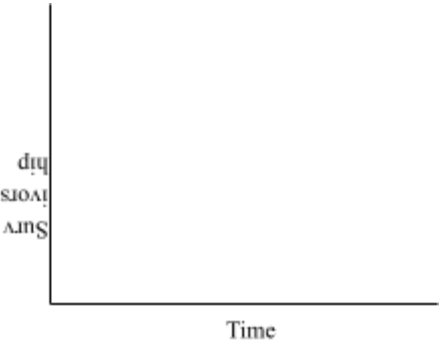


Density Dependent vs Density Independent Factors

13) What is the difference between density dependent and density independent factors? Give examples of each.

Survivorship Curves

14) Using the axes on the right, draw and label three survivorship curves exemplifying early-loss, late loss, and constant-loss species.



Country Case Studies, Developed vs Developing

15) List the four most populated countries in the world and their current population size.

- (1) _____ (3) _____
- (2) _____ (4) _____

16) Complete the following table by writing “high” or “low” in each box below.

Characteristic	More Economically Developed Countries (MEDCs)	Less Economically Developed Countries (LEDs)
per capita GDP		
degree of industrialization		
infant mortality rate		
per capita fossil fuel use		
ecological footprint		
greenhouse gas emissions		
risk from heart disease		
risk from infectious diseases		

17) How did China and India slow their population growth down? What are the advantages and disadvantages of these policies?

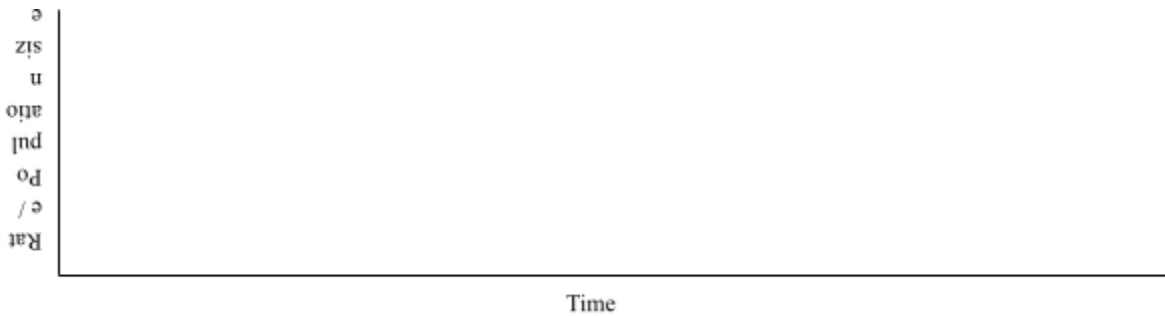
Age Structure Diagrams

18) On the axes below, draw and completely label four age-structure diagrams that represent slow growth, rapid growth, negative growth, and zero population growth (include labels on the x- and y-axes)



Demographic Transition

19) Use the axes below to draw and label lines representing the birth rate, death rate and total population size during the idealized demographic transition of a country. Include, written directly onto the graph, an explanation for each change in the birth rate, death rate and total population size.

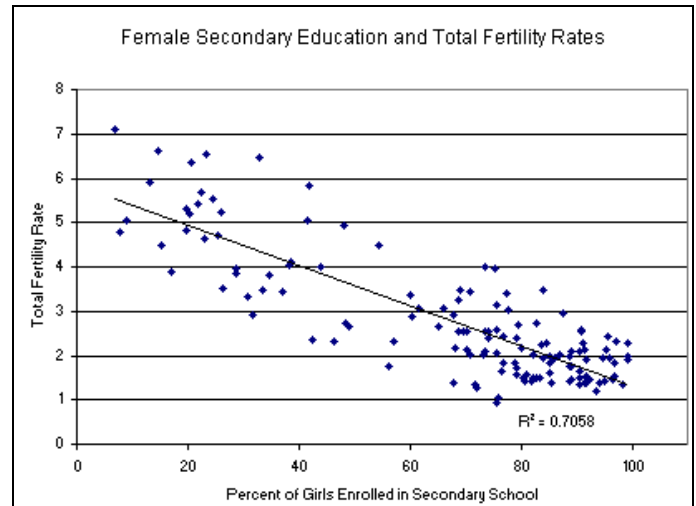


Replacement Level, Infant Mortality, and Total Fertility Rates

20) Define the following:

- a. total fertility rate:
- b. replacement level fertility
- c. infant mortality rate
- d. crude birth rate
- e. crude death rate

21) Consider the graph on the right and explain what can be inferred from the data it presents.



US Demographics

22) What factors affect America's population demographics?

23) What is the number one way to decrease population size?

Death Rate Declines

24) Why have death rates decreased in the last one hundred years?

Urbanization

25) Match the ten most populous urban areas in the world with its respective continent:

- | | | |
|----------------|-------------------|------------------|
| ___ Sao Paulo | ___ Tokyo | a. Asia |
| ___ Delhi | ___ Seoul | b. North America |
| ___ Osaka/Kobe | ___ Mexico City | c. South America |
| ___ Shanghai | ___ New York City | d. Africa |
| | ___ Mumbai | e. Australia |
| | | f. Europe |

- 26) What is urban sprawl?
- 27) What are three environmental negative effects of urban sprawl?
- 28) What is zoning?
- 29) Why do citizens leave rural areas to live in urban areas?

Environmental Impacts of Population Growth

- 30) Describe three environmental impacts caused by the increase of humans on this Earth.

Modified by S. Velarde who modified by A. Willis from David Hong's AP Environmental Science Review Packets (Diamond Bar HS).