

Name _____

Date _____

APES: Doubling Time (Using the Rule of 70) Calculations:

Doubling Time - When a population grows exponentially, the time it takes for the population to double, called "doubling time (symbol "dt"), can be approximately calculated using the "Rule of 70," which in formula form looks like this:

$$dt = 70/r \text{ ("r" is sometimes written as "k")}$$

where **dt** = doubling time (usually in years) and **r** (or "k") = the growth rate expressed as a percentage. NOTE: 5% must be entered as 5 instead of 0.05.

CALCULATIONS:

- 1) Given a 2010 world population growth rate of about 1.30% per year, how long would it take the world's population to double? By what year would this doubling occur?
- 2) If the population growth rate continues at 1.30%, and you are 17 years old now, how old will you be when the population doubles?
- 3) Scientists and Demographers are fairly sure that the growth rate will slow in both developing and developed countries. With that in mind, if the growth averages about 1.10% over a doubling time period, how long will it take the world's population to double? By what year would this doubling occur, and how old would you be if you are 17 years old now?
- 4) If the doubling time for the world's population is 56 years, what will be the growth rate over this time period?
- 5) The current world population is about 6.5 billion. Using the growth rate calculated in #4, by what year will the world's population double? How old will you be if you are 17 years old now? (Don't get fooled by this question, only use relevant information when making your calculation)

Some properties and thoughts about doubling time:

- > The larger the "r", the faster the doubling time.
- > "r" varies considerably among different organisms: small bodied organisms grow faster and have larger rates of population increase than large-bodied organisms.
(Ex. Think bacteria vs. an elephant)
- > Do populations REALLY grow exponentially? Sometimes, but not usually for long!!

NOTE: You will need to know how to calculate "doubling time" on a test as well as know the properties and thoughts about doubling time listed above.