APES

POPULATION FORMULAS--CALCULATING GROWTH

SIMPLE GROWTH RATE OF A POPULATION

$N_1 = N_0 + B - D + I - E$ where B=birth rate (natality), D=death rate (mortality), I = immigration, E = emigration, N_0 = population size at initial time, and N_1 = population size at a later time

INTRINSIC RATE (*r*) OF INCREASE FOR POPULATION GROWTH

$r = B - D$

RATE OF CHANGE FOR POPULATION SIZE

$dN/dt = rN$

NET GROWTH OF A POPULATION (R_0)

$R_0 = N_1/N_0$

DOUBLING TIME FOR A POPULATION

$D_t = 70/R_0$

ANNUAL % RATE OF NATURAL POPULATION CHANGE

$\% = [(B-D)/1000] \times 100$

Sample Multiple-Choice Questions—Population

1. If a population doubles in 70 years, it is showing a _____ % growth.
    a) 1
    b) 5
    c) 35
    d) 140
    e) 200

2. On an island off the coast of Venezuela, 700 tanagers live. Population biologists determined that this