

Human Population Growth

Name: _____

Introduction: Darwin's first two observations in the exposition of Natural Selection involve population ecology: Populations have the potential to increase exponentially, but usually they remain constant in size. Both conditions are observed in nature and are associated with the balance of (births + immigrations) minus (deaths + emigrations).

Key Concepts:

- Population growth patterns
- Factors influencing population growth

What's due at the end of workshop next week:

- This worksheet and graph with all of the questions answered **10 points**

HOW DOES A POPULATION CHANGE?

Population size depends on how many (births + immigrations) minus (deaths + emigrations) there are. Let's look at four ways a population can grow.

For the following examples,

N = number of people in the population at any given time

N_0 = number of the original population

B = births (number of people joining the population)

D = deaths (number of people leaving the population)

t = time

A. EXAMPLE: The population remains constant over time (EQUILIBRIUM).

Imagine you are having a party in your living area. At the present time (N_0), there are ten people in your room. Every hour one person leaves and one person joins your party. How many people are in your room **three hours** after the party started?

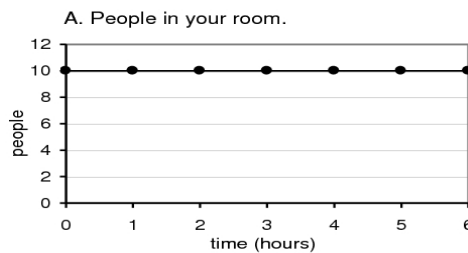
$$N(t) = N_0 + (B-D)/hr * t$$

$$N(3) = 10 + (1-1)/hr * 3hrs$$

$$N(3) = 10 \text{ people}$$

This produces a population growth curve that is a straight line with no slope.

(1 point)



1. Use **graph A.** above to determine how many people are in the room 5 hours after the party started.

2. Using the **equation** above, calculate how many are in the room 6 hours after the party started. Does your calculation agree with the graph?