**Pre AP Biology 11**

Concept 3: Population Ecology

ANALYZING DENSITY, DISPERSION, DEMOGRAPHICS, GROWTH, AND FACTORS THAT AFFECT GROWTH.

Chapter 53 in Campbell
p. 294-297 in Holtzclaw, Qs #3, 21, 22, 23 p. 304

*You must know:*

* How density, dispersion, and demographics can describe a population
* The differences between exponential and logistic growth models of population growth
* How density-dependent and density-independent factors can control population growth

**How can density, dispersion, and demographics can describe a population?**

Density - The number of individuals per unit of \_\_\_\_\_\_\_\_\_\_ or \_\_\_\_\_\_\_\_\_\_\_\_\_.

Things that affect density:

Dispersion - the pattern of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ among individuals within the boundaries of the population

Clumped - patches, usually around a required \_\_\_\_\_\_\_\_\_\_\_\_\_\_.  Example:

Uniform - result of \_\_\_\_\_\_\_\_\_\_interactions. Example:

Random - \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ spacing.  Not common, since there is usually a reason for dispersion



Survivorship Curves

Type 1 - \_\_\_\_\_\_\_\_death rates early and midlife,

then death rate \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ sharply

Type 2 - \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ death rates

Type 3 - very high \_\_\_\_\_\_\_\_\_\_\_\_death rates, than a flat rate

for the few surviving to older age groups.

Describe the Canadian human population in terms of density, dispersion, and demographics...

**What are the differences between exponential and logistic growth models of population growth?**

Life History → Traits that affect an organism’s schedule of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 (from birth through reproduction to death)

Life history has ‘trade- offs’

*How do the life histories of the dandelion and the coconut palm compare?*



**Exponential Growth Model**

The formula:  the per capita rate of population increase

assuming it is growing at the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ rate.

N is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_&

t is \_\_\_\_\_\_\_\_\_\_\_\_\_\_

A population with a higher maximum rate will grow faster

over time.

The J-Shape is characteristic of some populations introduced into new environments or that are rebounding after a catastrophic event.



**Logistic Growth Mode**

K= \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

The maximum population size that a particular environment

can \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Things that influence carrying capacity (limiting factors:



What type of growth model does this *Daphnia* show?

**r-selection –** density \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_selection

* maximize reproductive success in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_environments
* low densities
* density \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
* r = little competition
* population densities are well \_\_\_\_\_\_\_\_\_\_\_\_\_\_carrying capacity.

**K-selection** – density \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_selection

* populations living at density \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_imposed by their resources
* competition is relatively strong.

What are the density dependent factors that could affect these populations?

Density dependent factors include:

Try This:

1. Which of the following best describes opportunistic, or r-strategy, organisms?

(a) They reach sexual maturity rapidly

 (b) They reach their adult size slowly

 (c) They attain a large body size

 (d) They live for a long time

 (e) The size of their population remains fairly constant



2. a) What is the type of growth from 1-7 days?

b) What does the solid blue line represent?

c) After 9 days, is the population regulated by density dependent or independent factors?