

Chapter 14 Overview

Define: Habitat, ecological niche, competitive exclusion, ecological equivalent, competition, predation, symbiosis, mutualism, commensalism, parasitism, population density, population dispersion, survivorship curve, immigration, emigration, exponential growth, logistic growth, carrying capacity, population crash, limiting factor, density dependent limiting factor, density independent limiting factor, succession, primary succession, pioneer species, secondary succession. (27 words) (one quiz) (broken up word bank)

Answer:

14.1 Every organism has a habitat and a niche

1. How is a habitat different from a niche? _____

2. How is parasitism different from predation? _____

14.2 Organisms interact as individuals and as populations

3. What types of resources might organisms compete for? _____

Each population has a density, a dispersion, and a reproductive strategy

4. What is the formula for calculating population density? _____

5. List two reasons why a population would lived in a clumped dispersion pattern? _____

6. List two reasons why a population would live in a uniform dispersion pattern? _____

7. What is meant by the term reproductive strategy? What accounts for differences in reproductive strategies? _____

Name: _____

Period: _____

Chapter 14

Assignment Name	Points Value	Predicted Points	Actual Points
Vocabulary	25		
Notes	20		
Questions	20		
Guided Reading	10		
Lab: est. pop size	20		
Vocab Practice Sheet	10		

Self Evaluation Reflection Questions:

1. Did I come to class prepared everyday? _____
If no Why not? _____

2. Did I use my class time wisely? _____
If no why not? _____

3. Did I work to the best of my ability on my assignments or did I get lazy? _____

4. Did I ask meaningful questions if there was something I did not understand? _____

5. Was I a valuable member of my group or was I more of a distraction than anything else? _____

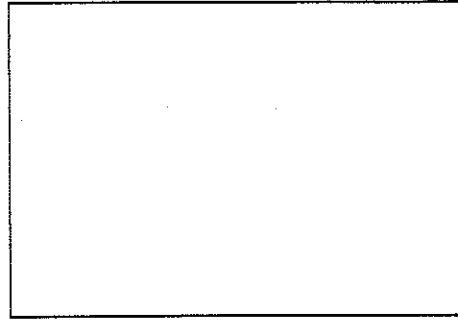
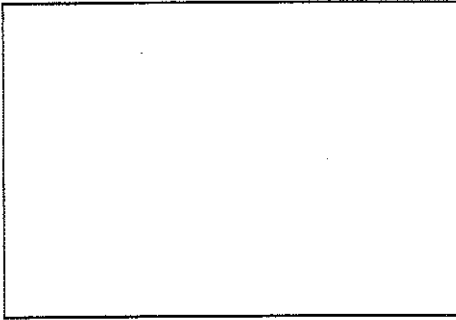
6. What did I do to prepare for the test? _____

7. What can Mrs. Wetzel do to help me in the next unit? _____

8. Calculate the population density for a group of 30 birds that live in an area of 3km^2 _____

14.3 Population growth is based on available resources

9. In the space below draw and label the two different types of population growth curves. Write a brief description next to each graph



10. What type of population growth is at risk for a population crash & why? _____

11. List three examples of density dependent limiting factors? _____

12. List three examples of density independent limiting factors? _____

14.4 Populations grow in predictable patterns

13. What four factors influence the size of a population? _____

14.5 Ecological succession is a process of change in the species that make up a community. Succession occurs following a disturbance in an ecosystem

14. Describe the four steps of primary succession _____

15. Describe the differences between primary succession and secondary succession _____

Population Dynamics

_____ : the _____ of a species that live _____ in an area
 _____ : the _____ of populations, make _____ about how a population will _____

Key Features of Populations

- _____
- _____
- _____
- (clumped, even/_____, random)

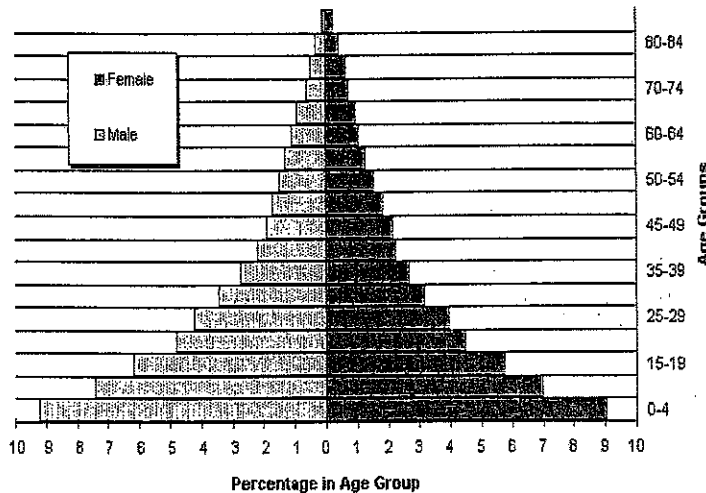
1. _____ : _____ of individuals in an area

_____ Rate: Birth Rate (_____) - Death Rate (_____)

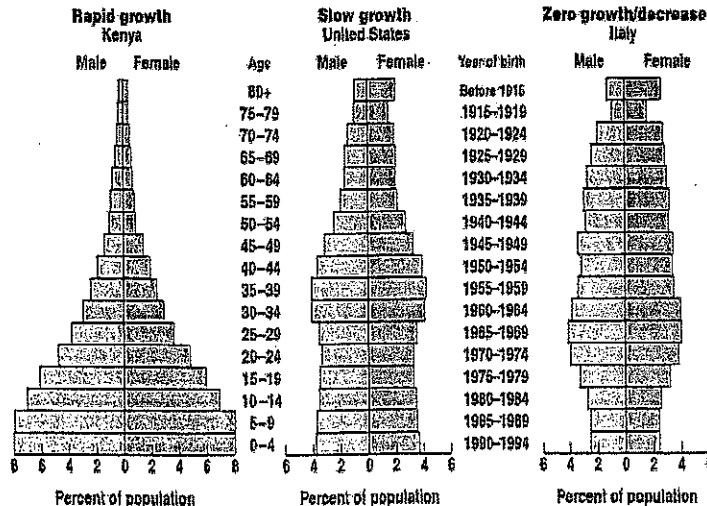
How many individuals are _____ vs. how many _____

_____ rate (b) - _____ rate (d) = rate of natural _____ (r). $b - d = r$

Population Pyramid for a Developing country



Age Pyramids



2. _____ : _____ of population per unit _____ or unit _____

Formula: $Dp = \frac{N}{S}$

Pop. Density = # of _____ ÷ unit of _____

4 Factors that affect density

1. _____ - _____ of individuals _____ a population

2. _____ - _____ of individuals _____ of a population

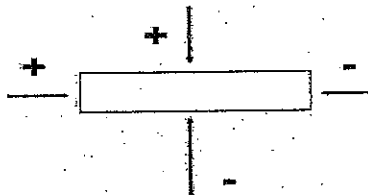
3 Density- _____ factors- _____ factors in the environment that have an _____ effect as population _____

Ex. _____, _____, _____

4. Density- _____ factors- _____ factors in the environment that affect populations _____ of their _____

Ex. _____, storms, _____, drought

Factors That Affect Future Population Growth



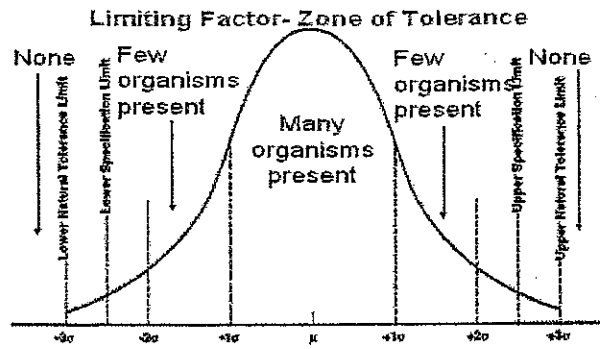
3. _____ : describes their spacing relative to each other

- _____
- even or uniform
- _____

Other factors that affect population growth

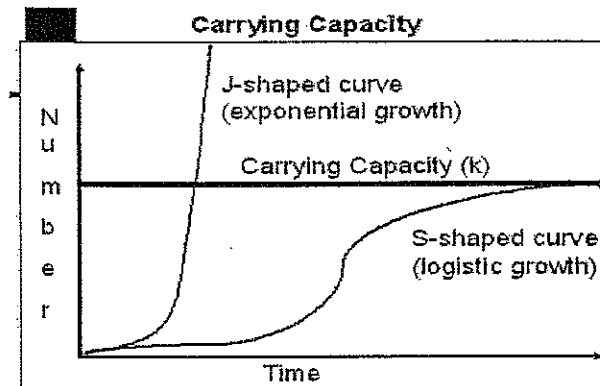
_____ factor- any _____ or _____ factor that _____ the _____ of organisms in a specific environment.

■ EX.- Amount of _____, Amount of _____, _____



_____ Capacity- the _____ population size that can be _____ by the available resources

- There can _____ be as many _____ as the environmental _____ can _____



2 _____ Patterns

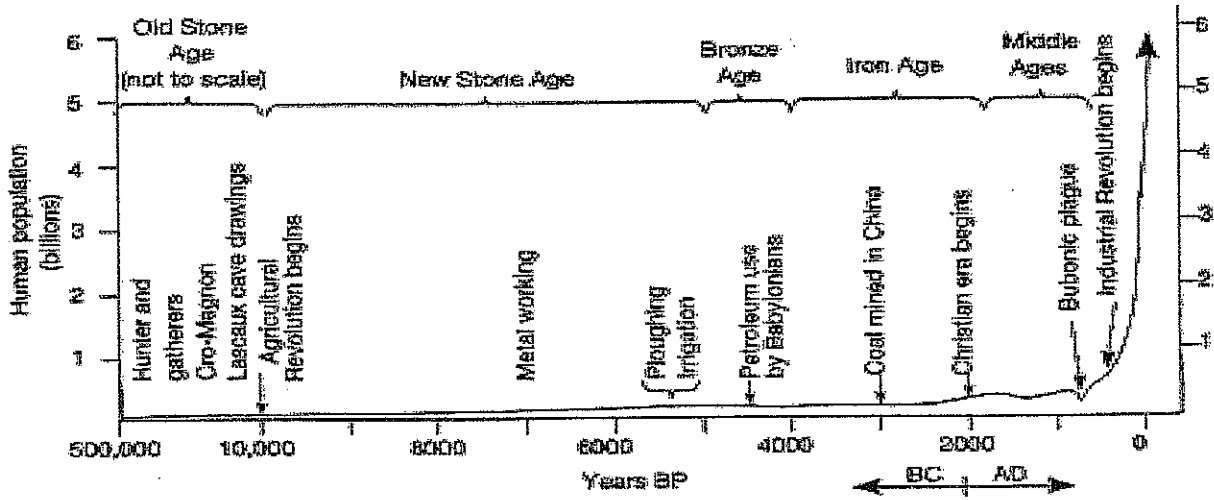
1. _____ Strategists

- _____ life span
- _____ body size
- reproduce _____
- have _____ young
- _____ parental care
- Ex: cockroaches, _____, bacteria

2. _____ Strategists

- _____ life span
- _____ body size
- reproduce _____
- have _____ young
- _____ parental care
- Ex: humans, _____

Human Population Growth



Succession in Ecosystems

_____ - a _____ of _____ in a community in which _____ populations of organisms gradually _____ existing ones

_____ succession- _____ of _____ sites by communities of organisms – takes place on bare _____

New bare rock comes from _____ sources:

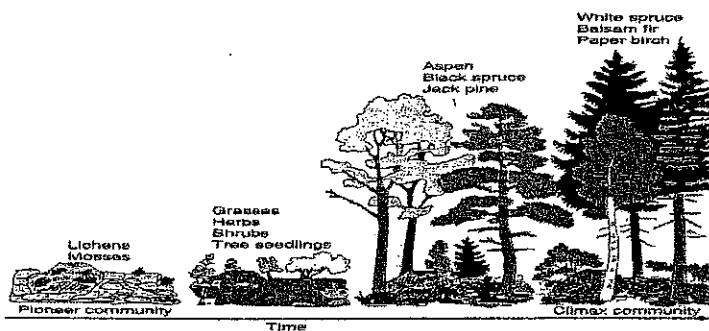
- ◆ 1. _____ flow cools and forms rock
- ◆ 2. _____ and expose rock

_____ organisms- the _____ organisms to _____ a new site

- ◆ Ex: _____ are the first to colonize lava rocks

_____ community- a _____ community that undergoes _____ or _____ succession

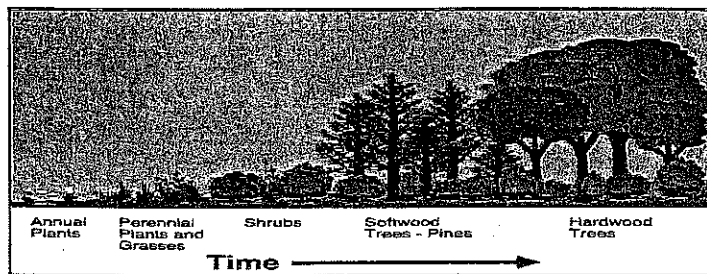
* Ex: In most of _____, the _____ community would be a deciduous _____ forest



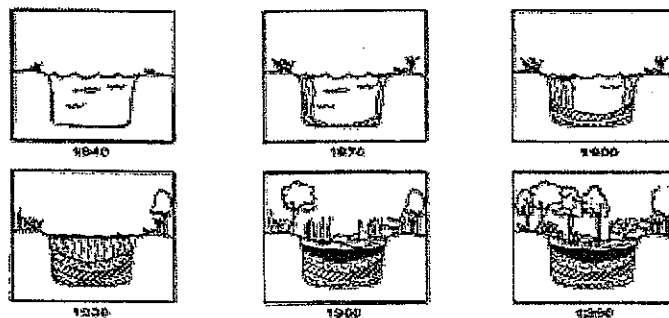
_____ succession- sequence of community _____ that takes place when a community is _____ by natural _____ or _____ actions – takes place on _____

Ex:

- ◆ A _____ levels portions of a _____
- ◆ A _____ plows his _____



Succession



Lab: Estimating Population Size

Go to : classzone.com, virtual labs, estimating population size

Problem: What is the estimated number of grasshoppers in a one acre area?

Why does it matter? _____

Hypothesis: It is hypothesized that there are _____ grasshoppers living in the meadow.

Experiment:

Materials:

-
-
-
-
-

Experiment:

1. Using nets sweep the meadow 3 times. Place collected grasshoppers in a collection jar.
2. Mark grasshoppers with paint
3. Record Number of grasshoppers on data sheet
4. Release grasshoppers to the center of the field
5. Wait _____ days
6. Sweep meadow three times. Place collected grasshoppers in a collection jar.
7. Count Grasshoppers
8. Record total number of grasshoppers and number of marked grasshoppers
9. Release Grasshoppers

Data:

	First Capture date _____	Second Capture date: _____
# in First Capture		
Total in Second Capture		
Marked in Second Capture		

$$P = M(n) / R$$

P = Estimated population

M = Grasshoppers in first capture

N = total in second capture, including marked and unmarked

R = Number of marked grasshoppers in second capture

Conclusion: The estimated number of grasshoppers in the field is _____

Analysis Questions:

1. Apply: The population density of these grasshoppers is one indicator of whether or not they are considered pests, and capable of causing damage to crops and plant life. Normally if these grasshoppers have a population of 0-3 grasshoppers per square meters, they don't pose a significant threat. Find the population density of these grasshoppers per square meter.

One acre = 4047 square meters. Then on average how many grasshoppers would be found in one square meter?

2. Evaluate: based on the population density you determined, explain whether or not the grasshoppers pose a threat to nearby crops.

3. Identify Causes: What are some factors that might cause changes in the population of grasshoppers?

4. Analyze: What are some factors that might affect the accuracy of your estimate?

5. Analyze: What are the advantages and disadvantages of the capture-mark-recapture method?

Guided Reading 14. 1

Answer the questions to the best of your ability **BEFORE** reading the section. Use the *X marks the spot reading technique* to help you find the relevant information in the reading. **THEN** go back and make any corrections.

1. Write either **Habitat** or **Niche** for the following statements

_____ All of the living and non living part of the environment in which an organism lives.

_____ All of the physical, chemical, and biological factors that a species uses.

_____ Where a species lives

_____ the part of the environment that a species uses to survive

_____ a species address

_____ a species "job" within its ecosystem

_____ includes food, nonliving conditions, and behavior

14.2 **Before** reading decide if the term in bold is true or false. If false try to guess at the right answer. **After** reading & using *the X marks the spot technique*, go back and correct the bold word if necessary to make the statement true.

	Before Reading	After Reading- Make Corrections
T/F Predation occurs when two organisms fight for the same limited resources.		
T/F Competition occurs when one organism captures and feeds upon another.		
T/F In Parasitism both organisms benefit		
T/F In Commensalism one organism benefits and the other is nether hurt not harmed		
T/F In Mutualism One species benefits and the other is harmed		

2. How are parasites different from predators? _____

CHAPTER

14

INTERACTIONS IN ECOSYSTEMS

Vocabulary Practice

habitat	parasitism	population crash
ecological niche	population density	limiting factor
competitive exclusion	population dispersion	density-dependent limiting factor
ecological equivalent	survivorship curve	density-independent limiting factor
competition	immigration	succession
predation	emigration	primary succession
symbiosis	exponential growth	pioneer species
mutualism	logistic growth	secondary succession
commensalism	carrying capacity	

A. What's the Difference? For each pair of words below, describe the difference between the two terms.

1. primary succession/secondary succession

2. ecological niche/habitat

3. logistic growth/exponential growth

4. density-dependent limiting factor/density-independent limiting factor

5. mutualism/parasitism

VOCABULARY PRACTICE, CONTINUED

B. Matching Write the vocabulary term next to its definition.

commensalism
competition

mutualism
parasitism

predation
symbiosis

- _____ 1. A close relationship between two or more individuals of different species that live in close contact with one another
- _____ 2. Type of symbiosis in which one individual benefits while the other individual is harmed
- _____ 3. Occurs when one organism captures and eats another organism
- _____ 4. Type of symbiosis in which both individuals benefit
- _____ 5. Occurs when two organisms fight for the same limited organisms
- _____ 6. Type of symbiosis in which one individual benefits while the other individual neither benefits nor is harmed

carrying capacity
emigration

immigration
limiting factor

population crash

- _____ 7. The movement of individuals *out* of a population into another population
- _____ 8. The maximum number of individuals of a certain species that an environment can normally support over a long period of time
- _____ 9. The movement of individuals *into* a population from another population
- _____ 10. A dramatic decline in the size of a population over a short period of time
- _____ 11. A factor that controls the size of a population



Learning Target Sheet
Ecology #2
Interactions and Relationships in Ecosystems

Learning Targets: 1.

Warm Up:

Draw a picture of the following cycles

Water Cycle:

Carbon Cycle:

Oxygen Cycle:

Nitrogen Cycle:

Upcoming Assignments:

Learning Target Sheet
Ecology #2
Interactions and Relationships in Ecosystems

Exit Slip Activity:

Complete the following Sample Keystone questions 45, 47

Standard BIO.B.4.2.5

A farmer observed that an increase in a field's soil nitrogen content was followed by an increase in producer productivity. What does this observation **most likely** indicate about the relationship between nitrogen and the producers in the field?

- A. Nitrogen was a biotic factor.
- B. Nitrogen was a limiting factor.
- C. Nitrogen became a surplus resource.
- D. Nitrogen became a selection pressure.

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Standard BIO.B.4.2.3

Which statement correctly describes how nitrogen in the soil returns to the atmosphere?

- A. Soil bacteria convert nitrates into nitrogen gas.
- B. Decomposers directly convert ammonium into nitrogen gas.
- C. Plants assimilate nitrites and convert them into nitrogen gas.
- D. Nitrogen-fixing bacteria in plant roots convert nitrates into nitrogen gas.

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