

Ecological Organization

- Ecology
  - relationships between \_\_\_\_\_ and their \_\_\_\_\_
- Biosphere
  - the portion of earth where \_\_\_\_\_ exists

Characteristics of Ecosystems

- Requirements
  - Constant flow of \_\_\_\_\_ from the \_\_\_\_\_
  - Cycle of materials
- Abiotic Factors of Ecosystems (nonliving)
  - Light, \_\_\_\_\_, water, soil, gases, \_\_\_\_\_
  - Also called \_\_\_\_\_ factors
- Biotic Factors of Ecosystems (living)
  - Trees, \_\_\_\_\_, fungi, \_\_\_\_\_

Species

- Organisms that look alike and can \_\_\_\_\_ among themselves.

Population

- all members of a \_\_\_\_\_ living in a particular location

Community

- interacting \_\_\_\_\_ (white tail deer, maple trees, coral reef, etc.)

Ecosystem

- members of a \_\_\_\_\_ and their physical environment
- The organisms plus:
  - \_\_\_\_\_
  - \_\_\_\_\_

How does a community differ from a population? An ecosystem?

## Habitat vs. Niche

- Habitat
  - \_\_\_\_\_ in which an organism lives
- Niche
  - the \_\_\_\_\_ a species fills in its habitat (what it \_\_\_\_\_, where it lives)

## Natural Selection

- A characteristic that makes an individual better \_\_\_\_\_ to its environment may eventually become common in that species through a process called \_\_\_\_\_.
- Natural selection results in \_\_\_\_\_, the \_\_\_\_\_ and \_\_\_\_\_ characteristics that allow organisms to live successfully in their environment.

## Niche

- Every organism has a variety of \_\_\_\_\_ that are suited to its specific living conditions.
- A \_\_\_\_\_ is the role of an organism in its habitat, or how it makes its living.
- A niche includes:
  - Type of \_\_\_\_\_ the organism eats
  - How it \_\_\_\_\_ its food
  - \_\_\_\_\_ the organism for food

## Competition

- There are three major types of interactions among organisms:
  1. \_\_\_\_\_
  2. \_\_\_\_\_
  3. \_\_\_\_\_

## Competition

- Different species can \_\_\_\_\_ the same habitat and food requirements.
- \_\_\_\_\_ is the struggle between organisms to \_\_\_\_\_ as they attempt to use the same \_\_\_\_\_ resource.
- In any ecosystem, there is a limited amount of \_\_\_\_\_, \_\_\_\_\_ and shelter.
- Organisms that survive have \_\_\_\_\_ that enable them to reduce competition.

## Predation

- \_\_\_\_\_ is an interaction in which one organism kills another for food.
- The organism that does the killing for food is the \_\_\_\_\_.
- The organisms that is killed for food is the \_\_\_\_\_.

Predator-Prey competition relationships help maintain stability within an ecosystem.

BUT...if a prey population decreases or is eliminated, predator population decreases.

Prey population

Predator population

Likewise, if a prey population increases, predator population increases.

Prey population

Predator population

## Symbiosis

- \_\_\_\_\_ – is a close relationship between two species that benefits at least one of the species.
- There are three types of symbiotic relationships:
  1. \_\_\_\_\_
  2. \_\_\_\_\_
  3. \_\_\_\_\_

## Survival Relationships

- ▶ A...Mutualism-a \_\_\_\_\_ relationship in which \_\_\_\_\_ species benefit ex ants and \_\_\_\_\_ trees. \_\_\_\_\_ protect the acadia tree by attacking any animal that tries to feed on tree, tree provides nectar and home for ants.
- ▶ B... Commensalism-symbiotic relationship in which one species is neither \_\_\_\_\_ or benefited. Ex orchids, ferns, mosses can \_\_\_\_\_ on branches of trees and benefit but tree not harmed or benefited
- ▶ C... Parasitism-interactions in which a member of one species \_\_\_\_\_ at the expense of another. Ex. \_\_\_\_\_ on dog, bacteria host

## Mutualism

- **Mutualism** – A relationship in which \_\_\_\_\_ species \_\_\_\_\_.
- Example:
  - The relationship between the Saguaro Cactus and Long Eared Bats.
    - Cactus flowers provide bats with \_\_\_\_\_
    - The cactus benefits because the bats carry \_\_\_\_\_ from cactus to cactus on their noses.

## Mutualism—you scratch my back I scratch yours

- Clownfish and sea anemones present an example of \_\_\_\_\_. The clownfish benefits by having a protected home territory. What does the sea anemone gain from this arrangement?
- One example of a mutualistic relationship is that of the \_\_\_\_\_ (a kind of bird) and the \_\_\_\_\_ or \_\_\_\_\_. Oxpeckers land on rhinos or zebras and \_\_\_\_\_ ticks and other parasites that live on their skin. The oxpeckers get food and the beasts get \_\_\_\_\_ control.
- Aphids and ants. The aphids secrete a sugary solution called \_\_\_\_\_. Ants drink the honeydew and, in return, they \_\_\_\_\_ the aphids from predators.

## Mutualism

- Lichens – algae And fungi
- A remarkable 3-way mutualism appears to have evolved between an \_\_\_\_\_, a \_\_\_\_\_ caterpillar, and an \_\_\_\_\_ in the American southwest. The caterpillars have \_\_\_\_\_ organs which the ants \_\_\_\_\_ from, and the acacia tolerates the feeding caterpillars. The ants appear to provide some \_\_\_\_\_ for both plant and caterpillar.

## Commensalism

- **Commensalism** – Is a relationship in which one species \_\_\_\_\_ and the other species is neither helped nor harmed.
- Example –
  - The red-tailed hawks' interaction with the saguaro cactus.
    - The hawks benefit by having a place to build their \_\_\_\_\_.
    - The cactus is not \_\_\_\_\_ by the hawks.
- Commensalism is \_\_\_\_\_ very common in nature because species are usually either helped or harmed a little by any interaction.

Commensalism- \_\_\_\_\_

List the four examples—you do not need to go into detail.

- \* \_\_\_\_\_ \*
- \* \_\_\_\_\_ \*

Commensalism

- Poison \_\_\_\_\_ and trees
- \_\_\_\_\_ and \_\_\_\_\_
- \_\_\_\_\_ and \_\_\_\_\_

Parasitism

- **Parasitism** – involves one organism living on or inside another organism and \_\_\_\_\_ it.
- The organism that benefits is called a \_\_\_\_\_.
- The organism that the parasite lives on or in is known as the \_\_\_\_\_.
- Common parasites are \_\_\_\_\_, ticks and leeches.
- These parasites have \_\_\_\_\_ that enable them to attach to their host and feed on their blood.
- Other parasites live inside the host’s body such as \_\_\_\_\_, that live \_\_\_\_\_ the digestive systems of dogs, wolves, and some other mammals.
- Unlike predators, a parasite does \_\_\_\_\_ usually \_\_\_\_\_ the organism it feeds on.

WHY IS THIS GOOD FOR THE PARASITE??????

Parasitism examples:

- \_\_\_\_\_ and \_\_\_\_\_
- \_\_\_\_\_ and \_\_\_\_\_

Zombie snails

What’s going on?

Complex Symbiotic Relationships

Fungus growing ants—what’s going on?

Parasitic wasps—what’s going on?

All 3

- **Parasitism**- GIVE ME TWO EXAMPLES ( +, -)
  
- **Commensalism** – GIVE ME TWO EXAMPLES (+, 0)
  
- **Mutualism**- GIVE ME TWO EXAMPLES (+, +)

## Nutritional Relationships

- **Autotrophs**
  - make their \_\_\_\_\_ food (plants)
  - Also called \_\_\_\_\_

## Nutritional Relationships

- **Heterotrophs**
  - eat \_\_\_\_\_ and other organisms
  - Also called \_\_\_\_\_
  - Examples are \_\_\_\_\_, fungi, protists, and bacteria
- **Types of Heterotrophs:**
  - **Herbivores**
    - eat \_\_\_\_\_
  - **Carnivores**
    - eat animals
      - Predators
        - » \_\_\_\_\_
      - Scavengers
        - » feed on animals they \_\_\_\_\_
  - **Omnivores**
    - eat \_\_\_\_\_ and \_\_\_\_\_

## Energy Flow Relationships

• **Producers**

- \_\_\_\_\_ (autotrophs)

• **Consumers**

- \_\_\_\_\_ (heterotrophs)
  - Primary – eat \_\_\_\_\_
  - Secondary – eat primary \_\_\_\_\_

• **Decomposers**

- Break down \_\_\_\_\_ organisms
  - (\_\_\_\_\_ and fungi)

• **Saprotrophs**

- \_\_\_\_\_ dead or decaying material
- Enzymes
- Fungi, \_\_\_\_\_

• **Detritivore**

- Eat \_\_\_\_\_ or \_\_\_\_\_ material
- Earthworms, \_\_\_\_\_, insects

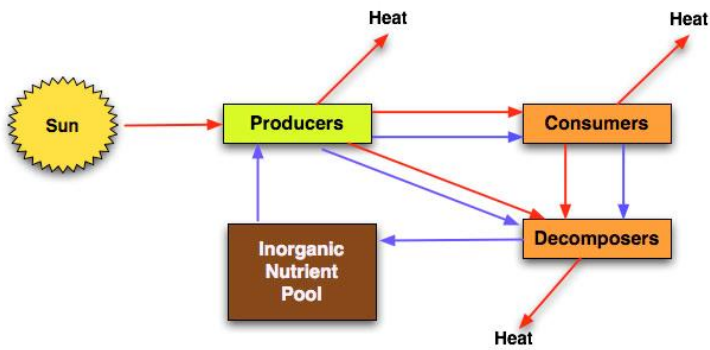
## Energy Flow

- \_\_\_\_\_ = \_\_\_\_\_ ENERGY = SUNLIGHT = \_\_\_\_\_ RADIATION
- The \_\_\_\_\_ is the primary source of energy on earth
- Living systems require a \_\_\_\_\_ input of energy to maintain organization. The input of \_\_\_\_\_ energy which is converted to \_\_\_\_\_ energy allows organisms to carry out life processes.

## Most Energy is Lost as Heat

- Within ecosystems energy \_\_\_\_\_ from the radiant energy of the sun through \_\_\_\_\_ and consumers as \_\_\_\_\_ energy that is ultimately transformed into \_\_\_\_\_ energy.
- Continual \_\_\_\_\_ of radiant energy is required by \_\_\_\_\_.

Only \_\_\_\_\_ of Solar Energy is Utilized for \_\_\_\_\_



The rest is \_\_\_\_\_ by other sources or lost as \_\_\_\_\_

Energy Flow Relationships

- Food chains
  - transfer of \_\_\_\_\_ in repeated stages
- Trophic Level
  - Feeding \_\_\_\_\_ (producers, primary consumers, secondary consumers, etc.) of the food chain

Food Web

- Food \_\_\_\_\_ interconnected
- Note that the arrows go in the \_\_\_\_\_ of energy flow!!

**PLAN YOUR OWN FOOD WEB – WHITEBOARD ACTIVITY!**

Ecological Pyramids

- Pyramid of Energy
  - shows how energy \_\_\_\_\_ from producers to \_\_\_\_\_
  - There is a \_\_\_\_\_ change level to level

Energy Pyramid - \_\_\_\_\_ Rule

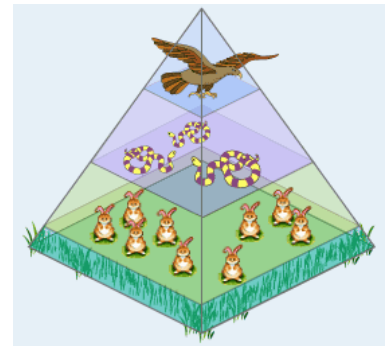
- Scientists estimate that only \_\_\_\_\_ of the sun’s energy is used in \_\_\_\_\_ !!
- The energy that is obtained is only \_\_\_\_\_ of the previous level’s energy.



# UNIT 1: ECOLOGY GUIDED NOTES

## Ecological Pyramids

- Pyramid of \_\_\_\_\_
  - Shows population sizes and how they \_\_\_\_\_ at each level
- Pyramid of \_\_\_\_\_
  - \_\_\_\_\_ found at each level
  - Producers at the \_\_\_\_\_, high level consumers on top

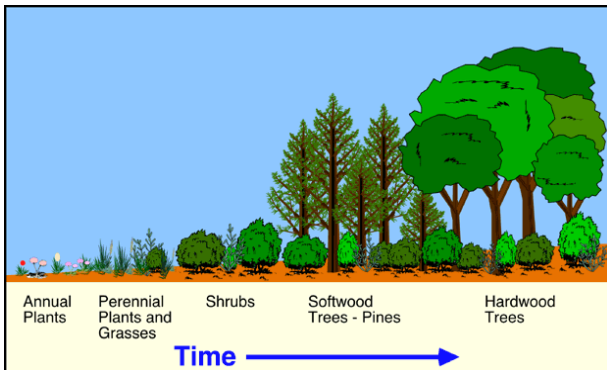


WHICH LEVEL HAS THE GREATEST BIOMASS?

## Ecosystem Formation

- Ecological \_\_\_\_\_
  - Replacement of one \_\_\_\_\_ by another
- Pioneer organisms
  - The \_\_\_\_\_ organisms in an area (lichens, algae)
  - They make a more \_\_\_\_\_ environment for other plants
  - \_\_\_\_\_, algae, grass
- Climax community
  - The \_\_\_\_\_ community
  - Remains until \_\_\_\_\_ destroys

## Forest Succession



Primary Succession- takes place where \_\_\_\_\_ has existed before.

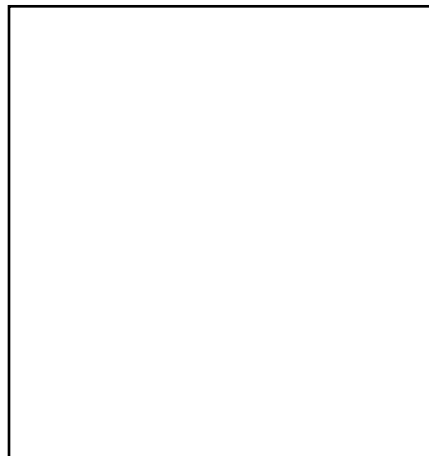
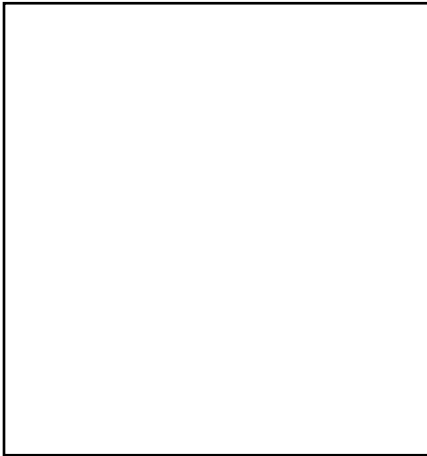
Secondary Succession – occurs where life has \_\_\_\_\_ existed

Pioneer Species

Carrying Capacity vs. Exponential Growth **DRAW AND LABEL**

J-shaped curve

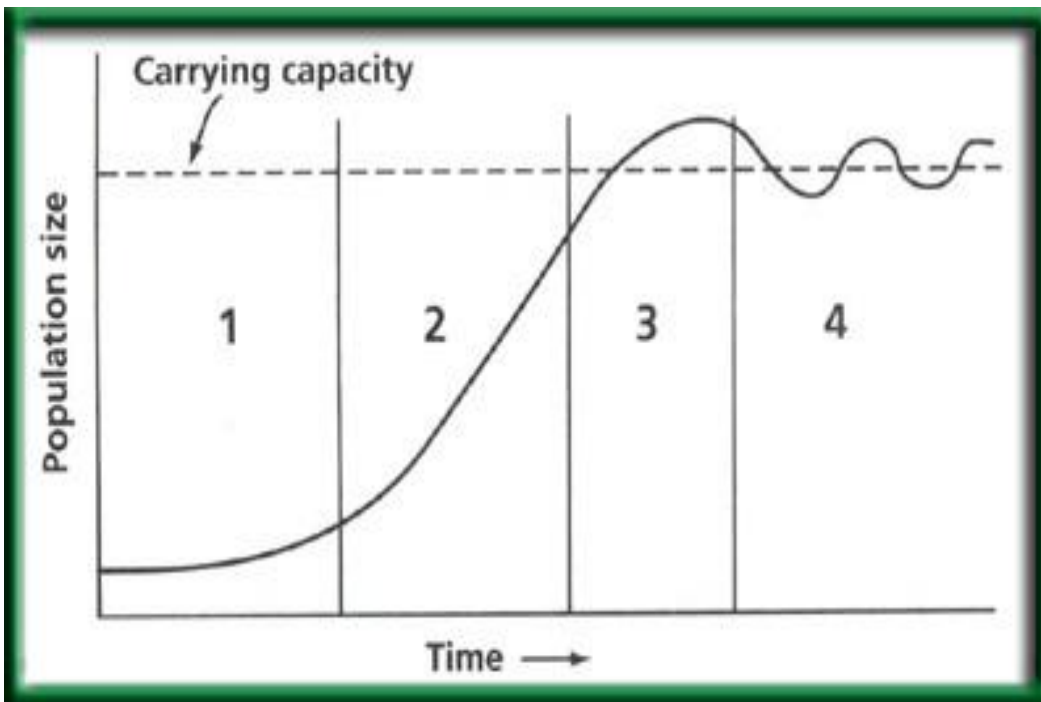
S-shaped curve



Carrying Capacity

- The \_\_\_\_\_ number of organisms of a particular type that can be \_\_\_\_\_ in an area...

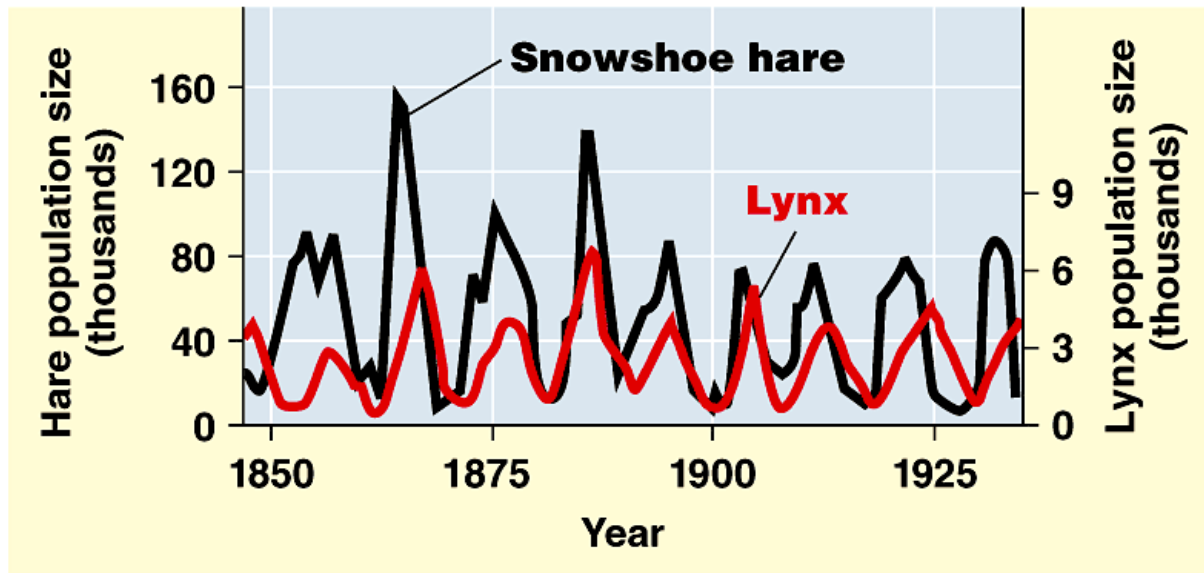
LET'S LABEL THIS!



Label the following parts of the graph: **exponential growth**; **population overshoot**; **population decline**; 4) **population recovery and stabilization**; and **carrying capacity**

Life History Patterns

- An organism's \_\_\_\_\_ pattern
  - Elephant's – \_\_\_\_\_ pattern
  - Mosquitoes – \_\_\_\_\_ pattern
- What are some factors that would keep the population at a steady level?
- Competition
  - organisms struggling for \_\_\_\_\_ resources



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Certain limiting factors are related to population density (size)...

- Density-dependent factors (food, disease, predators)
  - These factors have an \_\_\_\_\_ effect as the population \_\_\_\_\_.

Certain limiting factors are NOT related to population density (size)...

- Density-independent factors (temperature, storms, floods, droughts)
  - These factors can affect \_\_\_\_\_, regardless of their \_\_\_\_\_.

**Behavioral Adaptations**

- ⊙ As an organism develops special behaviors which are

\_\_\_\_\_ behavior (born with it---in the DNA) or

\_\_\_\_\_ behaviors and important for \_\_\_\_\_.

**Taxis (Innate)**

- \_\_\_\_\_ (Termites release pheromones for communication)
- \_\_\_\_\_ (Plants response to light)
- \_\_\_\_\_ TO LIGHT

**Migration (innate)**

The seasonal \_\_\_\_\_ of a complete \_\_\_\_\_ of animals from one area to another (IMMIGRATION vs EMMIGRATION)

**Estivation / Hibernation (Innate)**

- A state of lower \_\_\_\_\_ activity
- Estivation- \_\_\_\_\_; heat and drought
- Hibernation- \_\_\_\_\_; cold and drought

**Habituation (Learned)**

- Habituation is when an organism stops \_\_\_\_\_ to a \_\_\_\_\_ after repeated exposure.

**Imprinting (Learned)**

- Imprinting is learning that occurs early in \_\_\_\_\_ that cannot be changed such as ducks and geese recognizing the \_\_\_\_\_ person they see as their mother.

**Classical Conditioning (Learned) Stimulus association**

- Ex: \_\_\_\_\_ dogs

Bell = dog \_\_\_\_\_ because he associates it with \_\_\_\_\_.

**Trial and Error (Learned)**

- \_\_\_\_\_ and \_\_\_\_\_

**Camouflage**

- ⊙ To \_\_\_\_\_, \_\_\_\_\_, smell or sound such that it \_\_\_\_\_ in with their surroundings.

**Critical Thinking**

- ⊙ **What structural adaptations do animals and plants have for feeding, reproduction and life on land?**
- ⊙ **What behavioral adaptations do organisms have that help ensure survival?**

**Communication within Organisms: Pheromones**

- **Pheromones**-(bees, ants, termites) Pheromones are \_\_\_\_\_ released by living organisms that send \_\_\_\_\_ to other organisms of the same species via \_\_\_\_\_. These pheromones are released in response to \_\_\_\_\_, alarm, danger, and sexual \_\_\_\_\_. They are released by both insects and mammals in many situations. \_\_\_\_\_ *Pheromone (ants nearby)*, \_\_\_\_\_ *Pheromone* (releasing scents in response to \_\_\_\_\_, ants also release a scent when they are returning to their nest with food)

**Communication within Organisms: Territoriality**

- \_\_\_\_\_ communication
- Uses \_\_\_\_\_ (territory) to communicate ownership
- Fighting for resources ( \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_)
- Examples: \_\_\_\_\_, dog or cat peeing on things

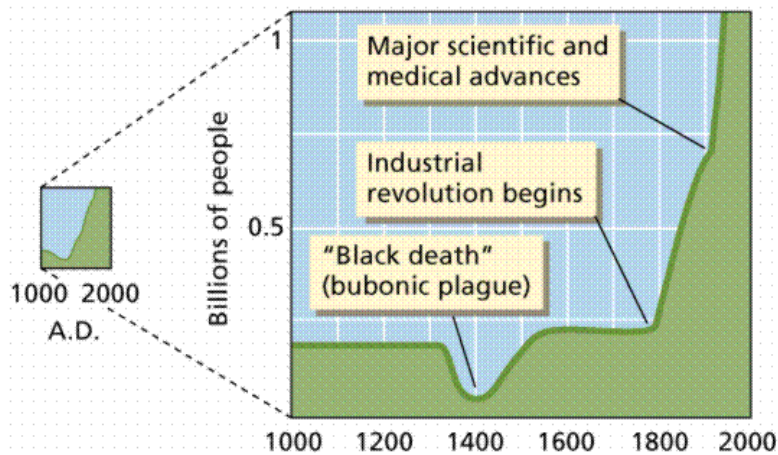
**Communication within Organisms: Courtship Dances**

- Courtship Dances— \_\_\_\_\_ SELECTION
  - \_\_\_\_\_
  - \_\_\_\_\_
  - \_\_\_\_\_

Human Population

- Demography – the study of \_\_\_\_\_ population size
  - Census
  - \_\_\_\_\_ rate (deaths/1000 people)
  - \_\_\_\_\_ rate (live births/1000 people)
  - Birth rate – death rate = \_\_\_\_\_

Human Population



Human population growth

- \_\_\_\_\_ has helped to increase Earth’s carrying capacity and population.
  - gas-powered farm equipment
  - \_\_\_\_\_
  - medical advancements
  - \_\_\_\_\_

World population and exponential growth

- As the human population grows what might be the impact on the following:
  - (1)
  - (2)
  - (3)

Resource use

- As population \_\_\_\_\_, demand for food, water, and land \_\_\_\_\_
  - Renewable resources
    -
  - Nonrenewable (cannot be renewed in the environment)
    - 
    - Growing use of nonrenewable resources may lead to a crisis.
- Resources must be \_\_\_\_\_ managed.

#### Resource use

#### Negative impacts

- Food
  - \_\_\_\_\_ (one type of crop) farmlands replace natural habitats
- Water
  - Diverting of natural \_\_\_\_\_ for cities (Las Vegas)
- Land
  - Habitat \_\_\_\_\_ to construct new living structures
    - Displaced organisms
  - Urbanization
    - \_\_\_\_\_ (flooding because of increased paving of roads, parking lots)
  - Beach erosion
    - Structures on beaches aid in the movement of \_\_\_\_\_
    - Loss of \_\_\_\_\_

#### Waste and pollution

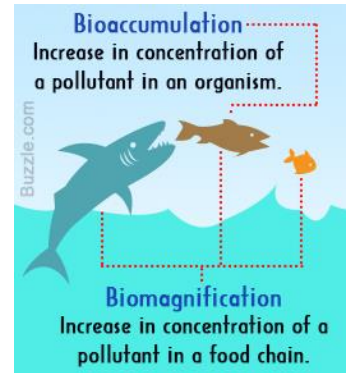
- \_\_\_\_\_ farming
  - Waste runoff from \_\_\_\_\_
    - Poo in the \_\_\_\_\_
- Factory \_\_\_\_\_ (burning of fossil fuels)
  - Sulfur dioxide and \_\_\_\_\_ dioxide react with \_\_\_\_\_ molecules
  - Creates \_\_\_\_\_ rain
    - Mount \_\_\_\_\_
    -
  - Carbon dioxide

- CO<sub>2</sub> is a \_\_\_\_\_ gas (keeps heat in, global climate change)

Waste and pollution

- Bioaccumulation

- Buildup of a \_\_\_\_\_ as it moves up the food web
- Pesticides
  - \_\_\_\_\_: water → zooplankton → fish #1 → fish #2 → seagull
  - DDT \_\_\_\_\_ in seagull was much greater than in water
- Mercury
  - Mad as a hatter
  - Sharks have a high \_\_\_\_\_ (top of the food chain!)



Waste and pollution

- CFCs
  - \_\_\_\_\_
  - Found in \_\_\_\_\_, refrigerants, solvents
  - Heavy use of CFCs caused the depletion of the \_\_\_\_\_ layer
    - Ozone layer protects us from harmful \_\_\_\_\_ radiation
  - CFCs also act as a \_\_\_\_\_ gas (keeps heat in)
  - Banned in 1989

Loss of biodiversity

Biodiversity

\_\_\_\_\_ of life in an area (or the world)

Availability of \_\_\_\_\_ and \_\_\_\_\_

Habitat loss is the leading cause of the \_\_\_\_\_ in biodiversity

Biodiversity

A. Invasive species:

\_\_\_\_\_ species inhabit an area with no natural  
 \_\_\_\_\_ (kudzu, stink bugs)

Invasive species thrive and \_\_\_\_\_ native species

B. Endangered species



A species that is likely to go \_\_\_\_\_ -

Habitat \_\_\_\_\_, \_\_\_\_\_, invasive species

Example:

*Spruce fir moss spider*

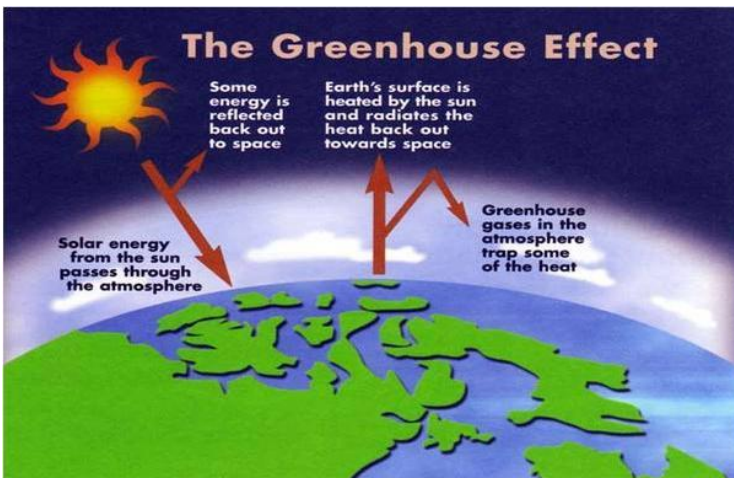
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Global climate change

- Greenhouse gases
  - Hold \_\_\_\_\_ in the atmosphere
  - Carbon dioxide
    - \_\_\_\_\_, \_\_\_\_\_
  - Methane
    - Source of \_\_\_\_\_
    - Cow farts, rice farming
  - \_\_\_\_\_ oxide
    - Burning anything!



**\*\*Increase in greenhouse gases increases the overall temperature of the Earth\*\*\***

By 2100, expected increase of \_\_\_\_\_ °F to 11.5°F

Habitats change too \_\_\_\_\_

Species cannot \_\_\_\_\_ quick enough

Leads to mass \_\_\_\_\_

Effective management of Earth’s resources will help meet the needs of the future

- Earth’s resources must be used \_\_\_\_\_.
- Careless use of resources makes them \_\_\_\_\_ to future generations.
- Easter Island is an example of irresponsible resource use.

Ecological Footprint

- An \_\_\_\_\_ is the amount of land needed to support a person.

- The land must produce and maintain enough

— \_\_\_\_\_

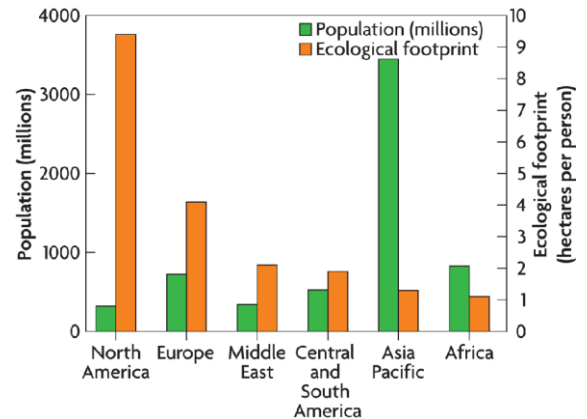
— \_\_\_\_\_

— \_\_\_\_\_

— \_\_\_\_\_

- Several factors affect the size of the ecological footprint.

- amount and \_\_\_\_\_ of resource use
- amount and \_\_\_\_\_ of waste produced



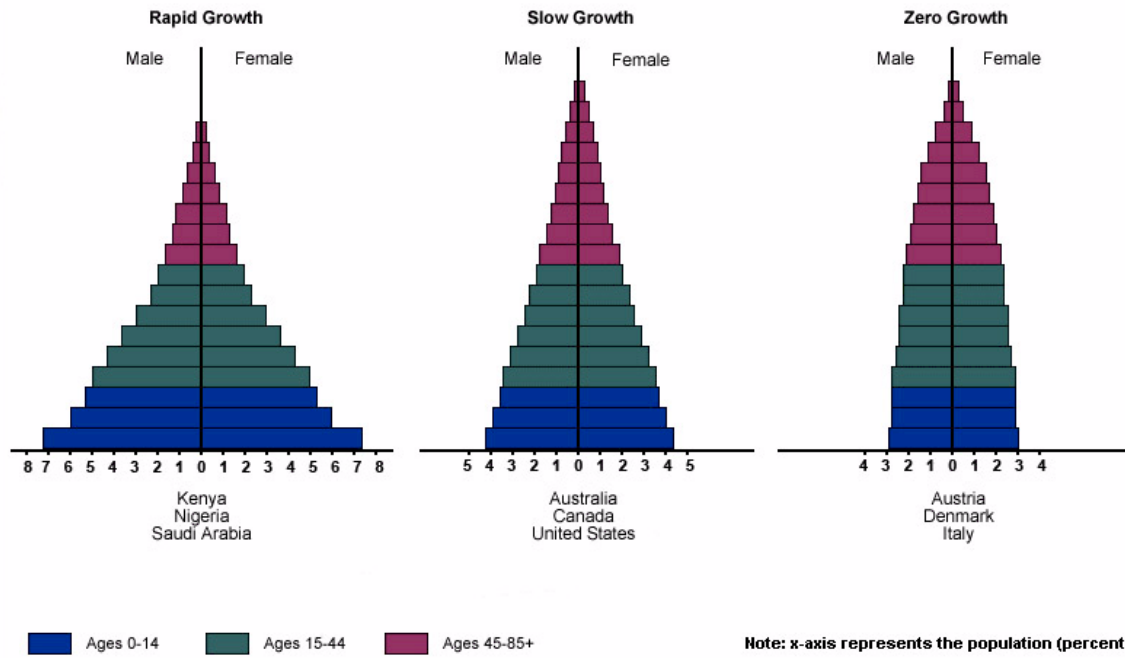
Disease and human population growth

- Viruses and Pathogens

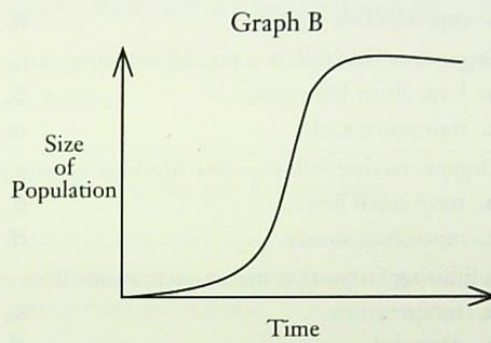
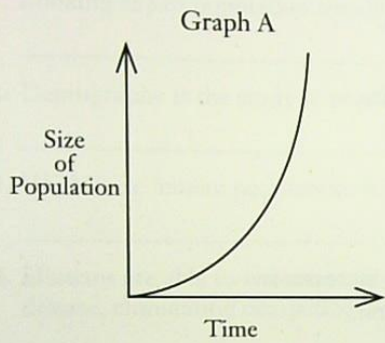
Not just human pathogens!

**MS. OSBORNE WRITING NOTES....COPY THESE HERE**

Age Structure – number of people at each different age



Refer to Graphs A and B below. Answer the following questions.



1. What type of population growth is shown in Graph A? Explain this type of growth.

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2. Which graph shows the most likely growth of a squirrel population living in a forest? \_\_\_\_\_

3. Which graph shows a population's growth under ideal conditions? \_\_\_\_\_

4. Why don't populations of organisms grow indefinitely?

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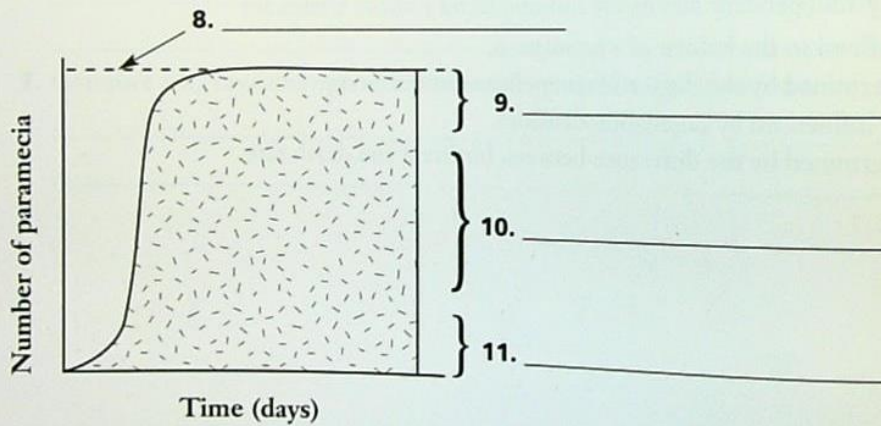


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Label the graph below, which depicts the population growth for a sample of paramecium. Use these terms: beginning growth stage, exponential growth stage, leveling-off stage, carrying capacity.



Biodiversity

- A wide range of different \_\_\_\_\_ of organisms living in an ecosystem
- More biodiversity = More \_\_\_\_\_ in the ecosystem
  - Biodiversity – \_\_\_\_\_
  - No biodiversity – \_\_\_\_\_
- Biodiversity allows ecosystems to better \_\_\_\_\_ a catastrophic environmental event

ow, write true or false.

9. Biodiversity provides our world with beauty.
10. The loss of a species from an ecosystem usually has no effect because of the presence of other species in the ecosystem.
11. Biodiversity decreases the stability of ecosystems because more species are competing with each other.
12. Increasing the biodiversity of an ecosystem may result in more niches.
13. Diseases are more likely to spread in an ecosystem with high biodiversity than in an ecosystem with low biodiversity.
14. A decrease in Earth's biodiversity may affect people's diets.
15. Preserving diverse plant species may lead to the discovery of new drugs in the future.

Cycles of Materials

- Which are the most abundant elements found in organisms?

—  
—  
—

Carbon Cycle

Driven by \_\_\_\_\_ respiration and \_\_\_\_\_

In what form is carbon dioxide found in the atmosphere?

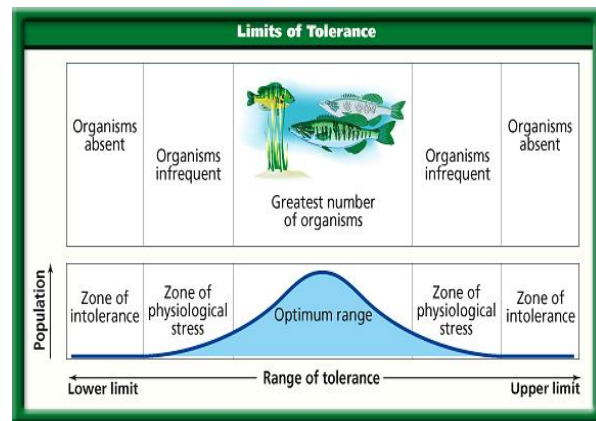
How does carbon enter the food chain?

What human activities increase the amount of carbon in the atmosphere?

Nitrogen Cycle

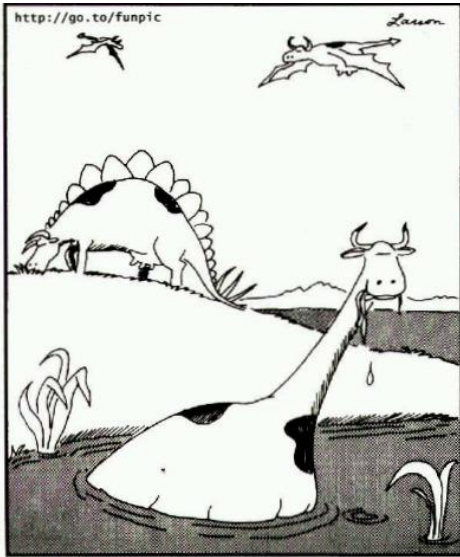
- Plants and animals can't use \_\_\_\_\_ nitrogen – it has to be converted!
- Nitrogen-Fixing \_\_\_\_\_ drive the nitrogen cycle
  - Nitrogen → \_\_\_\_\_
- They live in the root \_\_\_\_\_ of \_\_\_\_\_ (bean plants)

The ability of an organism to withstand fluctuations in environmental factors is known as \_\_\_\_\_.



Nitrogen Cycle and Human Impact

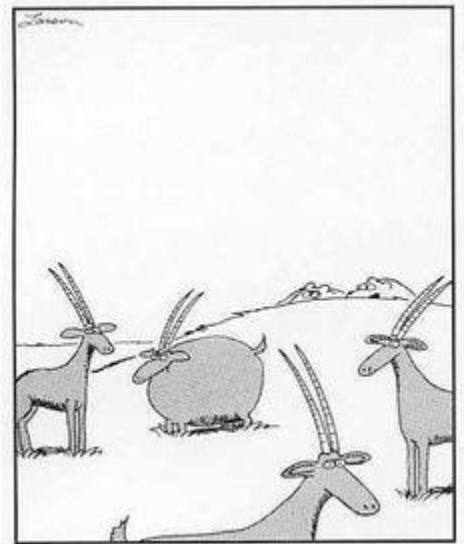
Column A	Column B
_____ 1. Tiny organisms that break down and absorb nutrients from dead organisms	<b>a.</b> autotroph
_____ 2. Obtains energy by feeding on other living organisms	<b>b.</b> commensalism
_____ 3. Step in the passage of energy and matter through an ecosystem	<b>c.</b> decomposer
_____ 4. Place where an organism lives out its life	<b>d.</b> food chain
_____ 5. Relationship between species in which one species benefits at the expense of another	<b>e.</b> food web
_____ 6. Manufactures nutrients using energy from the sun or from chemical compounds	<b>f.</b> heterotroph
_____ 7. Collection of interacting populations	<b>g.</b> parasitism
_____ 8. Simple model for showing how matter and energy move through an ecosystem	<b>h.</b> scavenger
_____ 9. Eats dead organisms	<b>i.</b> trophic level
_____ 10. Portion of Earth that supports life	<b>j.</b> habitat
_____ 11. Relationship between species in which one species benefits and the other is neither harmed nor benefited	<b>k.</b> community
_____ 12. Network of interconnected food chains	<b>l.</b> biosphere
_____ 13. Relationship between species in which both species benefit	<b>m.</b> ecology
_____ 14. Study of interactions among organisms and their environments	<b>n.</b> mutualism



Sixty-five million years ago, when cows ruled the earth



"And, as amoebas, you'll have no problems recruiting other sales reps ... just keep dividing and selling, dividing and selling."



"Dibs."

**BIOLOGY POSTTEST****POSTTEST**

1. Thymine makes up 32% of the nucleotides in a sample of DNA. What percentage of the nucleotides, therefore, is guanine?

A 36%                      C 18%  
B 32%                      D 16%

2. A fire completely destroys an ecosystem, driving away all the organisms and burning all vegetation to the ground. What is the first organism that needs to return in order for the ecosystem to reestablish itself?

A mountain lions  
B grasshoppers  
C birds  
D plants

3. Which of the following statements about nucleic acids is true?

A Nucleotides are made of a 5-carbon sugar, a nitrogen base, and a lipid.  
B DNA and RNA are examples of nucleic acids that are rarely seen in living things.  
C Nucleic acids are made of repeating units called lipids.  
D Nucleic acids store important information about cell division and the manufacturing of proteins.

4.



Which organelle shown in the picture above is used to transport compounds throughout the cell?

A ribosome  
B endoplasmic reticulum  
C nucleus  
D mitochondrion

5. In vascular plants, what is the purpose of vascular tissue?

A to transport water and dissolved minerals throughout the plant  
B to transport sugars from the leaves to the rest of the plant  
C to transport water and dissolved minerals from the leaves to the rest of the plant  
D to transport excess water and minerals from the plant back to the ground



6. Hemophilia is a recessive, sex-linked trait. A healthy mother and a hemophiliac father have a hemophiliac daughter. Which of the following statements is true?
- A All of their children will be hemophiliacs.
  - B None of their sons will be hemophiliacs.
  - C They can have a healthy daughter who is not a carrier.
  - D They can have a healthy son.
7. What is the function of the nucleus?
- A control center of the cell and stores genetic information
  - B contains enzymes to break down certain materials
  - C site of ribosome synthesis
  - D packages chromosomes to be moved into the cytoplasm
8. Which organism would be found at the top of an energy pyramid?
- A alligator      C shrimp
  - B bass            D green algae
9. Which of the following would be found in a prokaryotic cell?
- A mitochondria
  - B ribosomes
  - C endoplasmic reticulum
  - D golgi apparatus
10. Which of the following is the *best* description of homeostasis?
- A the movement of materials into and out of a cell
  - B the transport of molecules against the concentration gradient
  - C a state of biological balance
  - D when the same number of molecules are inside and outside of the cell
11. Which of the following is *least likely* affecting the state of a pond?
- A chemical fertilizer runoff from cropland
  - B manure runoff from cropland
  - C animal waste runoff from cattle and chickens
  - D trash produced by a farmer and his family

18. Bread rises as a result of yeast fermentation. How does fermentation cause the bread to rise?
- A Oxygen released during fermentation is trapped in the dough and causes the bread to rise.
  - B Alcohol that is produced during fermentation and trapped in the dough causes the bread to increase in size.
  - C Carbon dioxide that is released during fermentation and trapped in the dough causes the bread to rise.
  - D Carbon dioxide and oxygen that are released during fermentation cause the dough to rise.
19. Which of the following is one way that RNA is different from DNA?
- A RNA exists in four structural forms.
  - B RNA contains deoxyribose rather than ribose.
  - C RNA contains three strands of nucleotides.
  - D RNA contains uracil rather than thymine.
20. What type of pollination is *most likely* used by a plant that produces a large number of small seeds that are attached to feather-like structures?
- A insect                      C wind
  - B water                        D self
21. What can you state about the organisms *Quercus alba* and *Quercus phellos* by examining their names?
- A They are the same organism.
  - B They are not related.
  - C They are closely related.
  - D They are distantly related.
22. Which of the following statements about carbohydrates is true?
- A Carbohydrates consist of carbon, hydrogen, oxygen, and nitrogen.
  - B The ratio of hydrogen to oxygen is always 2:1.
  - C There are four classes of carbohydrates.
  - D Carbohydrates have a linear structure.