**2.1.1 - Food Chains, Food Webs, & Energy Transfer Notes**

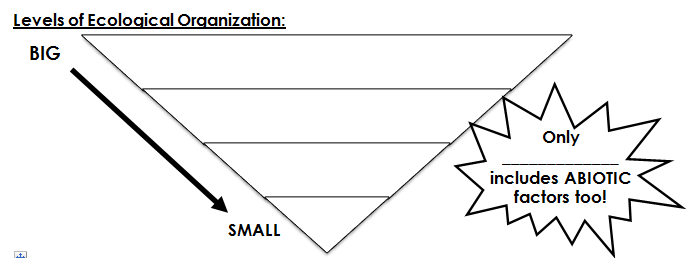
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**BIOTIC: ABIOTIC:**

**U9-1**

**Read the paragraph below. Circle the ABIOTIC factors. Draw a box around the BIOTIC factors.**

|  |  |  |
| --- | --- | --- |
| **Ecosystem** |  | Just like Charlotte, NC |
| **Community** |  | Just like North Meck |
| **Population** | Each population has a specific **niche** (a total way of life). The niche includes the **habitat**, place in food web, competition, interrelationships, and resource needs (temperature, water) | Just like your grade level…9th, 10th, 11th |
| **Individual** |  | Just like you! |

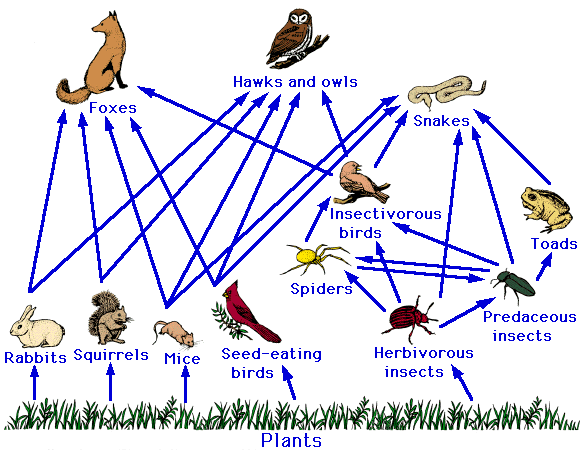
In recent years, the striped bass population in the Chesapeake Bay has been declining. This is due in part to “fish kills,” where a large number of fish die off. Fish kills occur when oxygen-consuming processes require more oxygen than the plants produce, which reduces the amount of oxygen available to the fish. One explanation is human activities that increased the amount of sediments suspended in the water, largely due to erosion from cutting down trees. The sediment acts as a filter for sunlight which causes a decrease in the amount of sunlight that gets to the aquatic plants in the Chesapeake Bay.

**U9-1**

Food Chains…show the \_\_\_\_\_\_\_\_\_\_\_\_\_\_ transfer and feeding relationships between \_\_\_\_\_\_\_\_\_\_\_\_.

* Example: The \_\_\_\_\_\_\_\_\_ eats (receives energy) from the \_\_\_\_\_ that eats (receives energy) from tadpole.

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Food Webs…are many food \_\_\_\_\_\_\_\_\_\_ combined.

Trophic Levels of the Food Chain:

**1) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** (also known as \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, self-feeders, or plants) are at the bottom of the food chain.

* Producers make their own food through \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
* Producers obtain their energy from the sun.
* Example: Grass, Algae, Plankton

**2) \_\_\_\_\_\_\_\_\_\_\_\_ Consumers** (also known as 1st consumers) are one level up on the food chain. (\_\_\_\_\_\_\_\_\_\_\_\_\_\_)

* Primary consumers eat & obtain energy from producers.
* Examples: Rabbits eating grass. Squirrels eating nuts.

3) **\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Consumers** (also known as 2nd consumers) are the next level up. (\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_)

* Secondary consumers eat & obtain energy from primary consumers.
* Example: Snakes eat rabbits that ate grass.

4) **\_\_\_\_\_\_\_\_\_\_\_\_ Consumers** (also known as 3rd consumers) are the next level up. (\_\_\_\_\_\_\_\_\_\_\_/\_\_\_\_\_\_\_\_\_\_)

* Tertiary consumers eat & obtain energy from secondary consumers.
* Example: Hawks eat snakes that ate rabbits that ate grass.
* These are often also called Top Consumers because they are at the top of the food chain.

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** - rot/break down dead organisms. Examples: mushrooms, bacteria

Other Important Terms:

* **Herbivore**- organisms that only eat \_\_\_\_\_\_
* **Carnivore**- organisms that only eat \_\_\_\_\_\_\_\_\_
* **Omnivore**- organisms that eat \_\_\_\_\_\_\_\_\_\_\_ & \_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_ of energy is passed up each trophic level of the food pyramid. Example: 10% of energy from grass is passed on to a rabbit. The rest of the energy (90%) is \_\_\_\_\_\_\_\_ as heat.

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_:** Toxins (poisons like pesticides, DDT, etc) are passed along each trophic level.

* The most toxins will bioaccumulate in animals at the \_\_\_\_\_\_\_of the food chain.

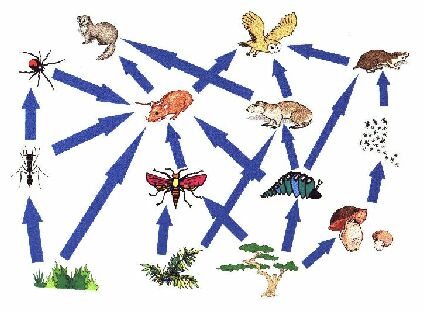
**2.1.1 Practice -** The diagram to the left is a food web composed of many food chains.

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* \_\_\_\_\_\_\_ % of energy is passed onto each trophic level. \_\_\_\_\_\_\_% is lost as \_\_\_\_\_\_\_\_\_\_.

**Practice:**

1.The mouse that ate the grass is a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.



2.The mouse that ate the moth that the tree is a \_\_\_\_\_\_\_\_\_\_\_\_\_\_.

3. The mushroom is a

\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

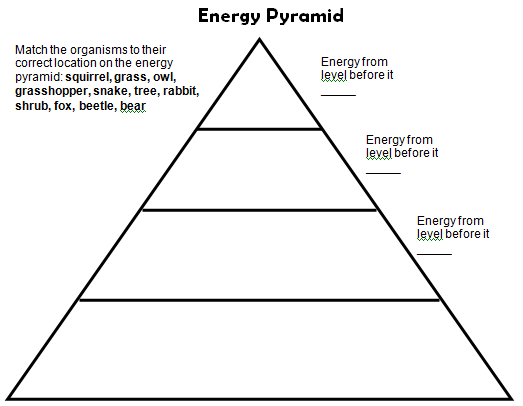
4. Which organisms produce the most energy?

5. If pesticide was sprayed on the grass, where would the most pesticide bioaccumulate?

6. What would happen to the ant population if spiders were removed from the food web?

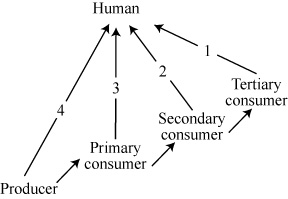
7. Label 2 Top Consumers.

8. Label 1 Primary Consumer.



Goal 2.1.1 - Practice EOC Questions

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1. The diagram shows one part of a food web. Along which arrow will a human most likely receive the highest proportion of usable energy per biomass consumed?

A. 1 B. 2 C. 3 D. 4

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2. Why do ecosystems rarely contain more than a few trophic levels?

A. Energy transfer efficiency is high.

B. Energy transfer efficiency is low.

C. Energy amounts remain constant.

D. Energy cannot flow through levels.

3. Using the following food chain, if 6500 kilocalories of energy are available to the grass, how much would be available to the snake? grass rabbit snake hawk

A. 650 B. 6500 C. 6.5 D. 65

4. Which of the following best describes the producers level in an energy and biomass pyramid?

A. most energy and organisms, least toxicity B. most energy and organisms, most toxicity

C. least energy and organisms, least toxicity D. least energy and organisms, most toxicity

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| --- | --- | --- |
| 5. As energy flows through each trophic level of a food chain, approximately what percentage of energy is lost as heat?  A. 10% B. 1% C. 100% D. 90% | | |
|  | |  |

6. What is the original energy source of almost all the energy in most ecosystems?

A. Carbohydrates B. sunlight C. water D. carbon

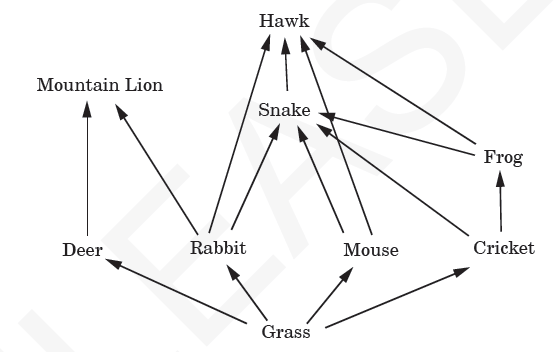
7. In this food web, which organism is the secondary consumer?

grass rabbit snake hawk

1. Grass B. rabbit C. snake D. hawk

8. Which level of an energy pyramid contains the most available energy?

A. Producers B. primary consumers C. secondary consumers D. tertiary consumers



9. Due to insecticides, the cricket population is greatly reduced. Which population is most affected by this event?

A. mouse B. hawk C. grass D. frog

10. In an ecosystem, which is the most likely reason for an increase in the producer population if there is an increase in the carnivore population?

A. fewer herbivores B. higher temperatures

C. less food D. more oxygen

11. Which sequence shows increasing ecological levels of organization?

A. organism, population, community, ecosystem B. ecosystem, population, organism, community

C. community, ecosystem, population, organism D. population, organism, ecosystem, community