**APES Lab Worksheet: Oh, What a Tangled Web We Weave**

Background:

 Plants use light energy of the sun to make food. The food is stored in the cells of the plant. Plants are called producers because they make food. Some of the stored energy in the food plants make is passed on to the animals that eat the plants. Plant-eating animals are called primary consumers. Animals that eat other animals are called secondary consumers.

 The pathway that food takes through an ecosystem is called a food chain. A food chain also shows the movement of energy from plants to plant eaters and then to animal eaters. An example of a food chain can be written:

 **seeds 🡪 sparrow 🡪 hawk**

Some of the food energy in the seeds moves to the sparrow that eats them. Some of the food energy then moves to the hawk that eats the sparrow. Normally, only about 10% of the energy produced by the “food” moves to the consumer. Most of the other energy is used to keep the organism alive and allow it to reproduce.

 Because a hawk eats animals other than sparrows, you could make a food chain for each animal the hawk eats. If all the food chains were connected, the result is a food web. A food web is a group of connected food chains. A food web shows many energy relationships.

Instruction for each page:

***Page 1. Draw TWO-CIRCLE VENN DIAGRAMS for the following: Provide 3 facts for each item***

1) food chain, food web

2) producer, consumer

3) heterotroph, autotroph

***Page 2. Draw THREE-CIRCLE VENN DIAGRAMS for the following: Provide 3 Facts for each item***

4) herbivore, carnivore, omnivore

5) population, community, ecosystem

***Page 3. FOOD CHAIN CONSTRUCTION***

6) Put the following organisms in order to make a food chain. Circle the producer. Put a square around the primary consumer. Put a triangle around the secondary consumer. Underline the tertiary consumer. Use the organisms below:

**corn snake**

**bluegrass**

**hawk**

**mouse**

***ENERGY PYRAMID***

***Page 4.***

Since only 10% of the energy produced by a level in a food chain is passed on to its predator, there have to be many more “prey” than “predators”. Draw a energy pyramid of the food chain listed in Page 3. Remember that there are more producers than primary consumers, more primary consumers and secondary consumers, etc.

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7. If 2000 kcal of energy are available in grass, how much energy would be available to the cow that eats

 the grass? To the human that eats the cow?

8. Which organism in this food web has the greatest influence on the ecosystem? Justify your answer.

***FOOD WEB CONSTRUCTION***

***Page 5.***

9.) Draw a food web on your own paper. Be sure to include all organisms listed below. Producers are placed along the bottom. Draw lines connecting organisms that are consumed or consume other organisms.

 \* Use different colors for each food chain.

algae frog robin ant goldfish swallow blue-green bacteria grasshopper trout blue jay grizzly bear turtle caterpillar human waterbug chicken mountain lion wheat crabgrass oak tree willow tree domestic cat owl wolf

10.) Label each organism as the following:

 **P= Producer H=Herbivore C= Carnivore O=Omnivore**

11.) Label each organism if they are the following: Many will be more than one kinds.

 **1=Primary Consumer 2= Secondary Consumer**

 **3= Tertiary Consumer 4= Quaternary Consumer**

***Page 6. (Answers Questions 12-23 from the food web on page 5)***

12) What will happen to each higher population size if the first level population were to dramatically decrease? Why?

13) What will happen to each higher population size if the first level population were to dramatically increase? Why?

14. If 5000 kcal of energy are available in wheat, how much energy would be available to the grasshopper that eats the grass? \_\_\_\_\_\_\_\_ To the human that eats the grasshopper?

15. In how many food chains do the following animals appear?

 hawk \_\_\_ robin\_\_\_\_ turtle \_\_\_\_ human \_\_\_\_ blue jay\_\_\_ grizzly bear\_\_\_

16. In how many food chains do plant(s) appear?

17. List the names of the living things in this ecosystem that are producers.

18. List those things that are only secondary consumers.

19. What is another name for an animal that is only a secondary consumer?

20. What is another name for an animal that eats both plants and animals?

21. What would happen to the food web if all the plants were removed? Explain.

22. Explain why populations for top consumers are usually much smaller in comparison to the lower tropic level organisms.

23. Identify the top consumers for your food web.