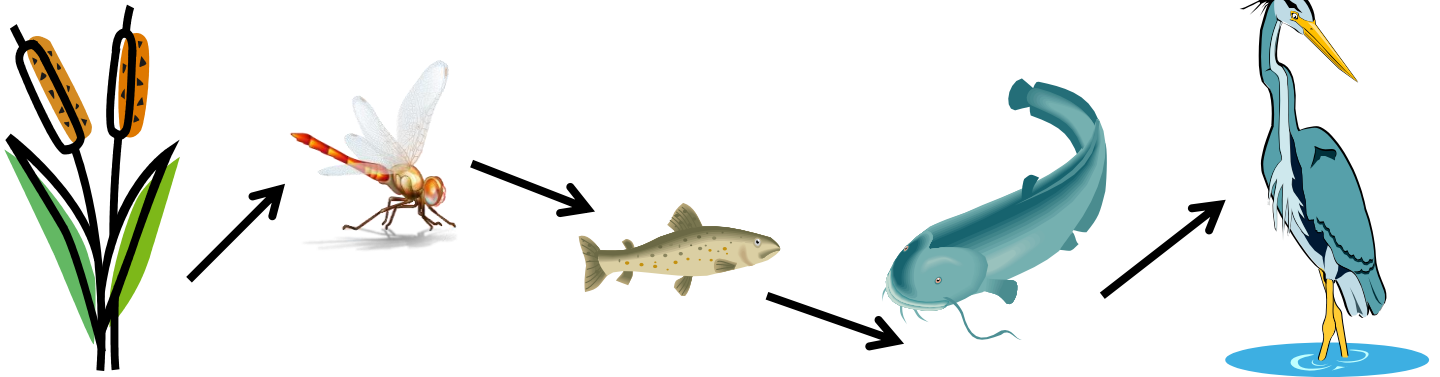


Energy Flow Stations

Food Chain



Cattail → Dragonfly → Small Fish → Catfish → Heron

1. The heron is considered a quaternary consumer. Label the trophic levels of each organism in the food chain.

_____ → _____ → _____ → _____ → _____

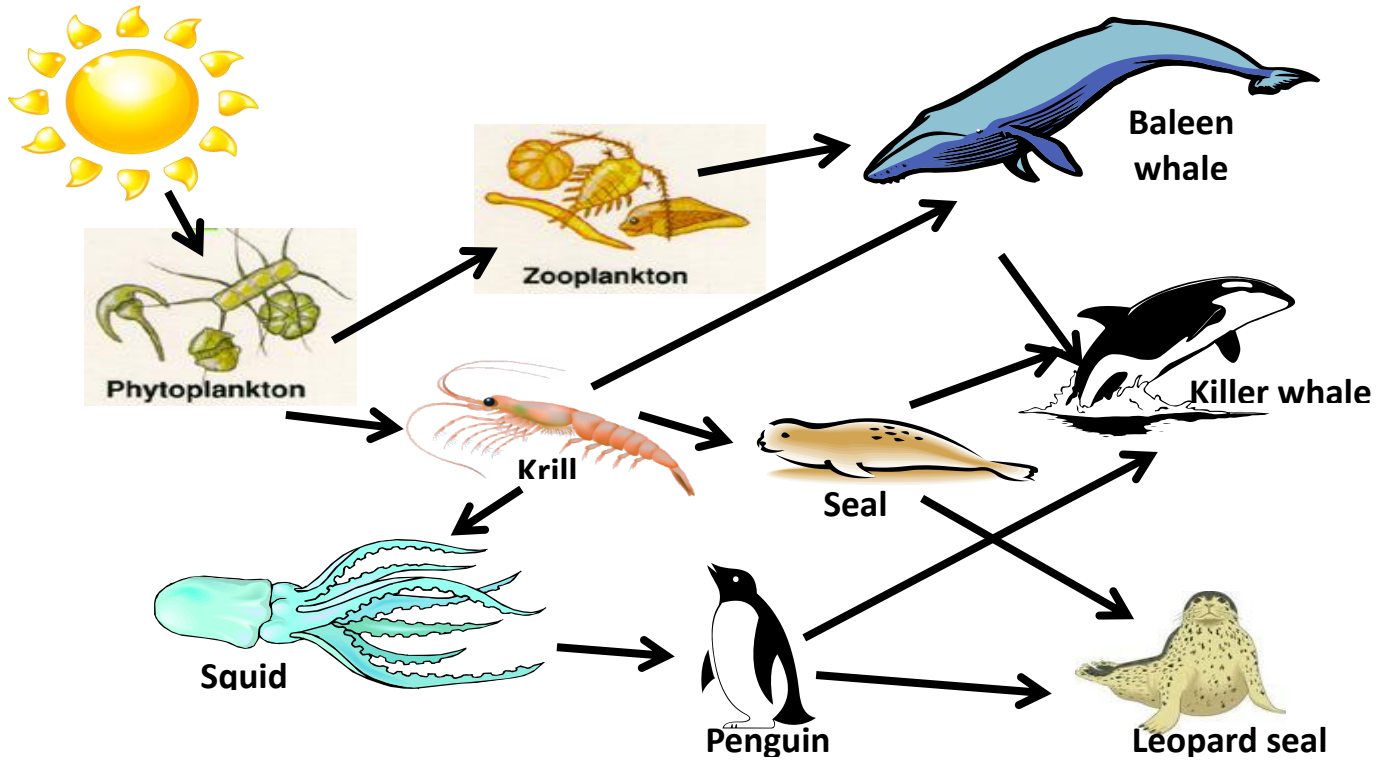
2. Where does the cattail get its energy? _____

3. Explain what the arrows represent in a food chain. _____

4. Describe 2 things that would happen if all of the small fish were removed from the food chain above. _____

Bonus: What biome would this food chain be found in? _____

Food Web



1. Where did all energy in this food web originate from? _____

2. Place each organism from the food web above in the appropriate trophic level below.

****Some organisms will be in more than one trophic level.***

Producer →	Primary Consumer →	Secondary Consumer →	Tertiary Consumer →	Quaternary Consumer
XXXXXXXX				
XXXXXXXX	XXXXXXXX			XXXXXXXX
XXXXXXXX	XXXXXXXX	XXXXXXXX		XXXXXXXX

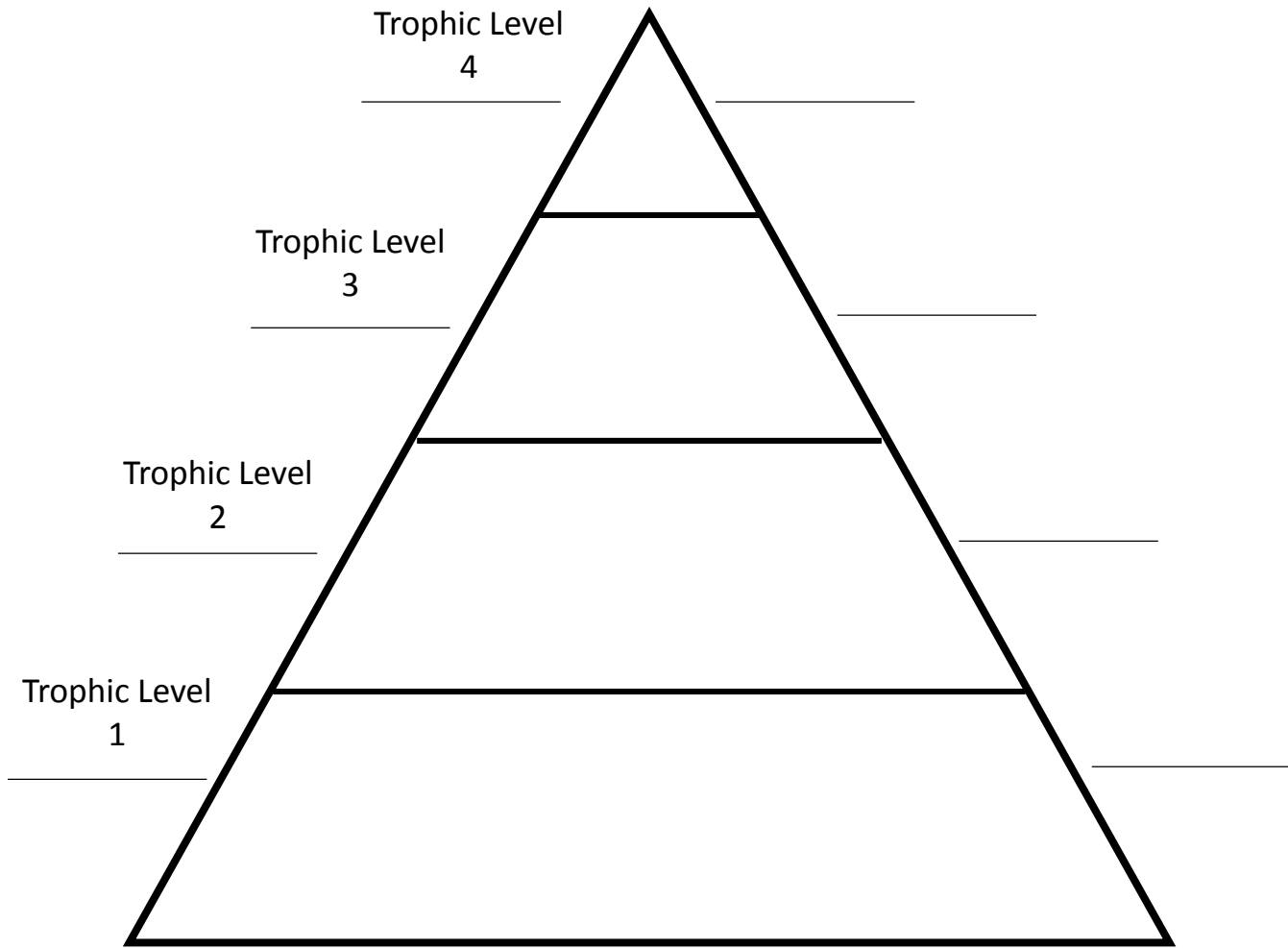
3. Describe the relationship (use vocabulary) between baleen whales and krill.

4. Diagram the flow of energy through one food chain from this food web. Use words and arrows. _____

5. Describe 2 things that would happen if there was an increase in the krill population.

Bonus: What biome would this food web be found in? _____

Energy Pyramid



1. Place the organisms in the appropriate trophic level.



insects

hawk



Sagebrush



lizard

2. Label each level of the energy pyramid with the appropriate vocabulary term on the right.
3. Label the % of energy available at each trophic level.
4. What happens to the other 90% of the energy that is not passed on from each trophic level.

5. What consumer in the energy pyramid is going to have to eat the most food to meet their energy needs? _____
6. Describe in your own words why energy in an environment can be represented by a pyramid. _____
7. Create a food chain with same organisms from above, using words and arrows.

Composting

You know what plants need to live, don't you? Water, Sunshine, and Dirt, right? Well, that's correct, but to have the *healthiest plants*, did you know you need the *healthiest dirt*? It's true! This passage will describe how to make a really healthy dirt project called *compost*.

Composting is also a great way to cut back on the garbage that ends up at the dump. In fact, a part of the United States government called the Environmental Protection Agency says that leftover food scraps and trimmings from our yards like cut grass and leaves make up a big part (about 25 percent) of the garbage we throw away! We can make a difference in the world by using that waste in our gardens instead!

To make compost, you will need a mixture of different types of natural organic garbage such as these: Wetter "Green" Waste (nitrogen source) - grass clippings, coffee grounds, vegetable trimmings, banana peels, and so on.

Dryer "Brown" Waste (carbon source) – fallen leaves, sawdust, hay, natural wood chips, and so on.

DON'T use any meat or animal products or any type of animal waste products. These can create bad smells and unhealthy germs and may attract pests. Also don't use anything that's had chemicals on it like weed killer on grass clippings.

When you start the pile, add a bit of regular dirt so you'll have some of the special microorganisms (decomposers) in there to help break down your waste into rich, nutrient-filled soil. Worms are great for this too, especially red wiggler worms. If you have a few of those, you'll get good results even with small composting projects. (Store bought potting soil won't have the right stuff, so don't bother with that.) During decomposition, the bacteria will give off energy in the form of heat, so don't be alarmed if you notice steam coming off the pile on a cold morning. This is because microorganisms are converting chemical energy to heat energy. Carbon dioxide is also produced when biomass is chemically broken down.

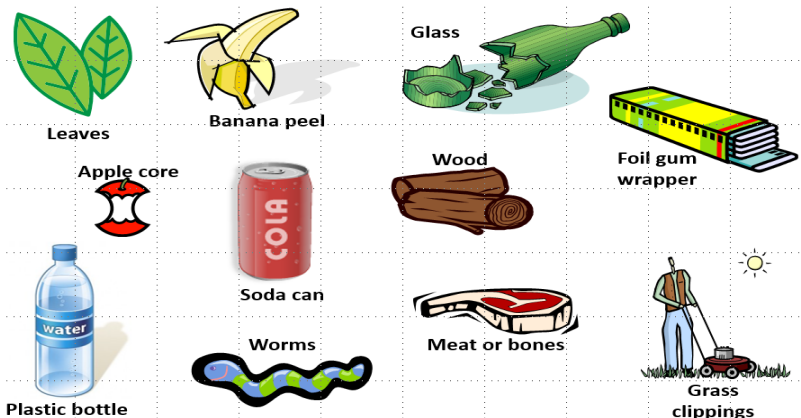
If you have a large yard, you could just make a pile at the back of your yard or make a bin out of wood posts and chicken wire. If you have close neighbors or you don't have a large yard, a closed bin may work better. For the best results, keep your compost moist, but not soggy. Turn it over to mix it up every few days to once a week or so. The biomass of the compost bin will decrease as it decomposes. When your compost looks like rich, dark dirt, it's ready to add to your garden soil to make it healthy dirt for your plants.

1. Why is composting good for the environment? _____

2. Why is it important to have green and brown in a compost bin? _____

3. Use the T chart to sort things that should and should NOT be in a compost bin. List the name of each material in your chart.

Compost	Trash



4. What happens to the amount of biomass of a compost bin? _____

5. What happens to the temperature of a compost bin over time? _____

6. What energy conversion happens in a compost bin? _____

7. What type of organism breaks down biomass in a compost bin? _____