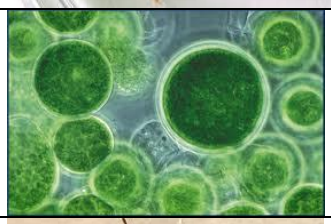
Essential Questior Nature?

Activity 4 - Food Chains, Webs, Matter Cyclers & Energy Pyramids

Purpose: **a. Understand the differences between a creature's niche and its habitat.**
b. Be able to show how matter cycles in the environment
c. Be able to show and analyze the flow of energy in an energy pyramid.

Key Concepts: Niche, Habitat, Matter cycling, Energy Flow, Food Chain, Food Web, trophic level

1. **Guided Practice: Niche vs Habitat: Tell** each of the following organisms **niche** (what organism eats for food/energy) and **habitat** (where organism lives).

Data Table 1 – Niche vs Habitat in a Wetland Ecosystem				
Organism	**Image**	**Habitat**	**Niche**	**Adaptations**
Kingfisher				
Dragonfly Larva (aquatic)				
Algae				
Mayfly Larva				
Snail				
Cutthroat Trout				

"From the stars we came, and to the stars we return."
Jack Campbell, Relentless

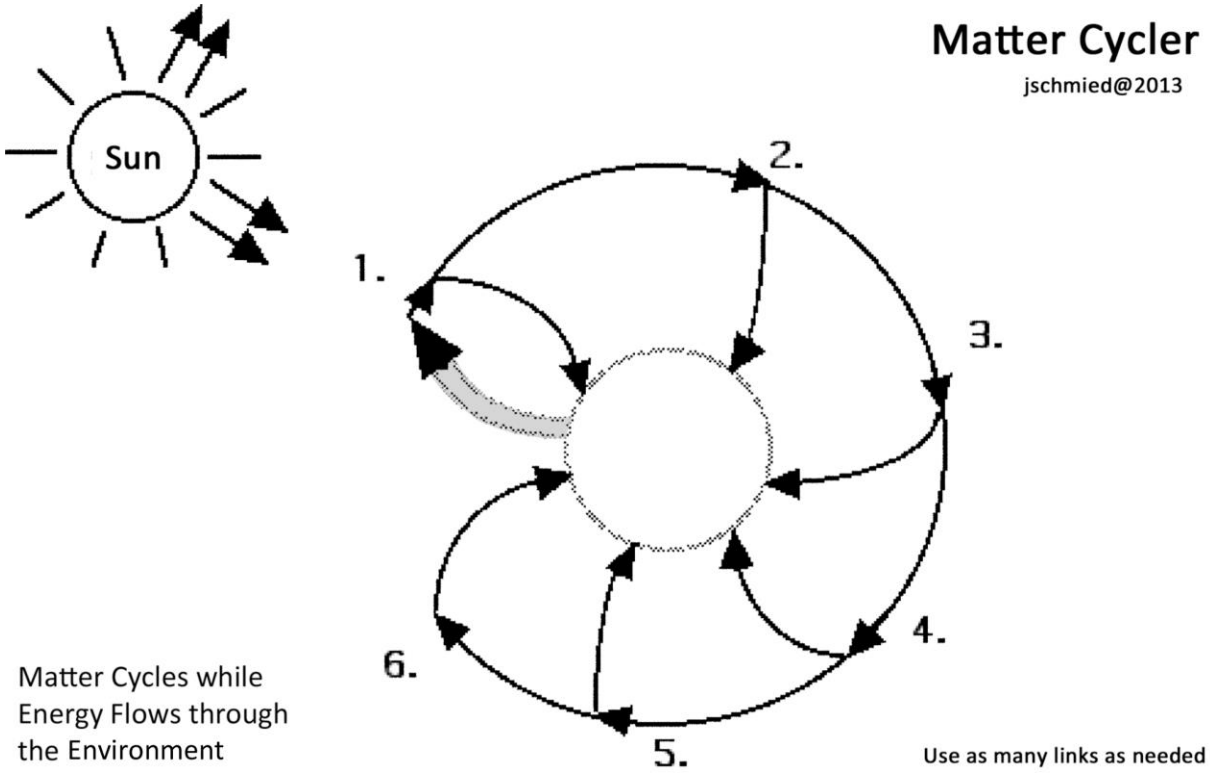
Student Review: 1-Below Standard, 2-Approaching Standard, 3-Standard, 4-Above Standard Use the scale to evaluate completeness & correctness of the job. Put score, Initial & date in boxes.	Score	Initial/Date

2. Guided Practice: Draw a food chain using these aquatic organisms – (A food chain is a simple way of showing how energy passes through organisms in one part of the environment.)

Kingfisher	**Dragonfly Larva**	**Algae**	**Mayfly Larva**
Sun	**Peregrine Falcon**	**Snail**	**Cutthroat Trout**

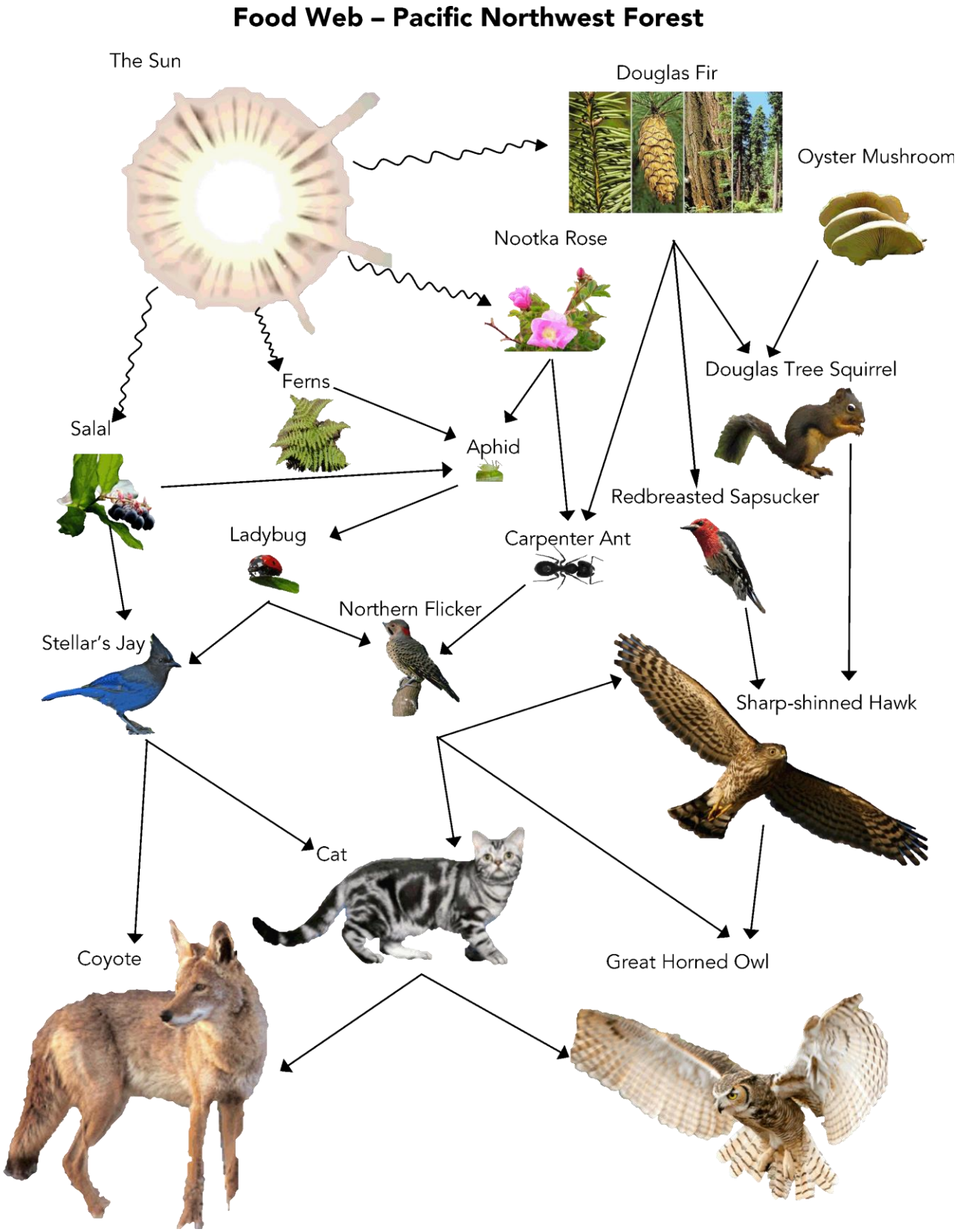
3. Guided Practice: Complete a Matter cycler using the organisms from 2 above.

A matter cycler shows how matter cycles in the environment, while also showing niche & trophic level info.



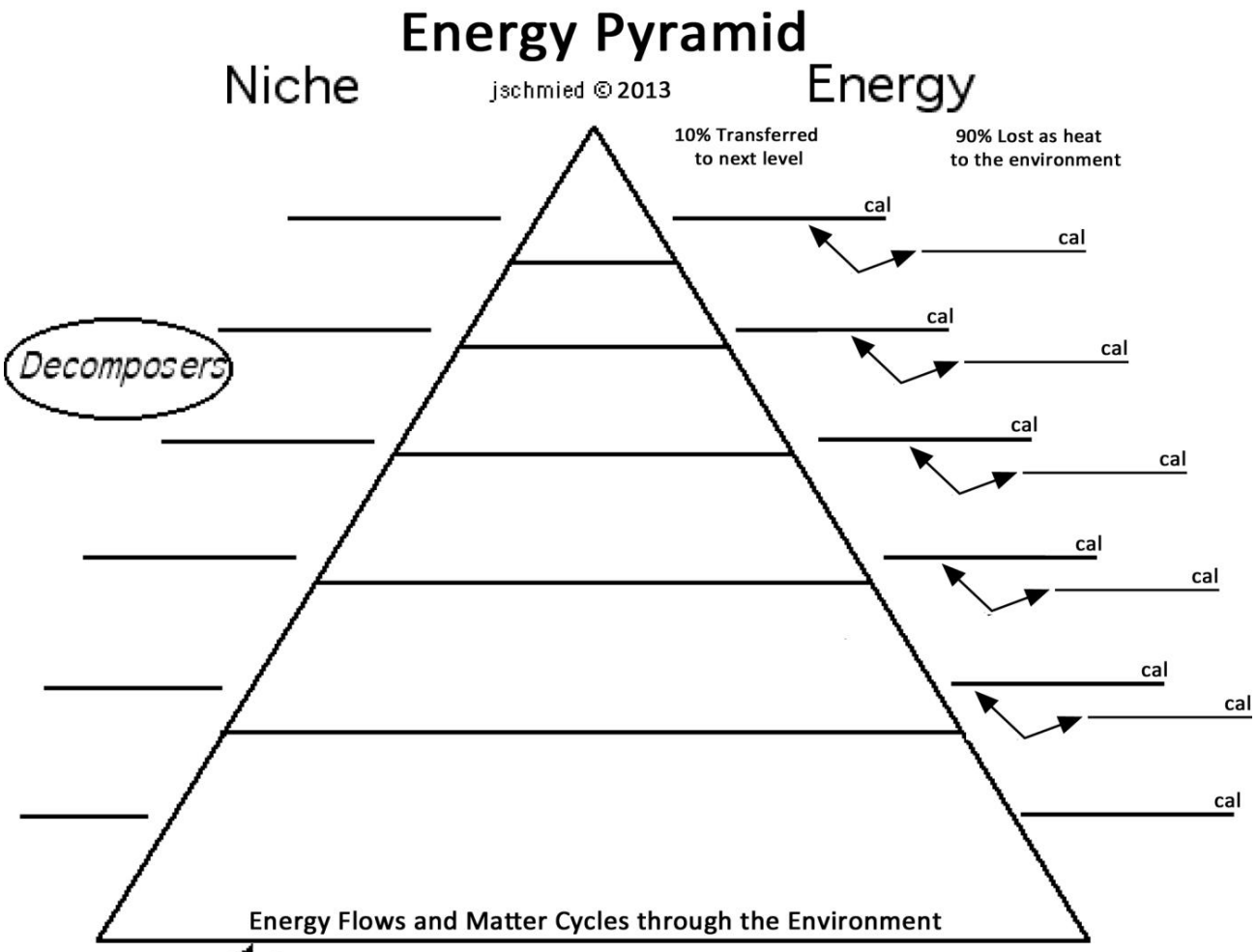
4. Food Web Analysis of a Pacific Northwest Food Web

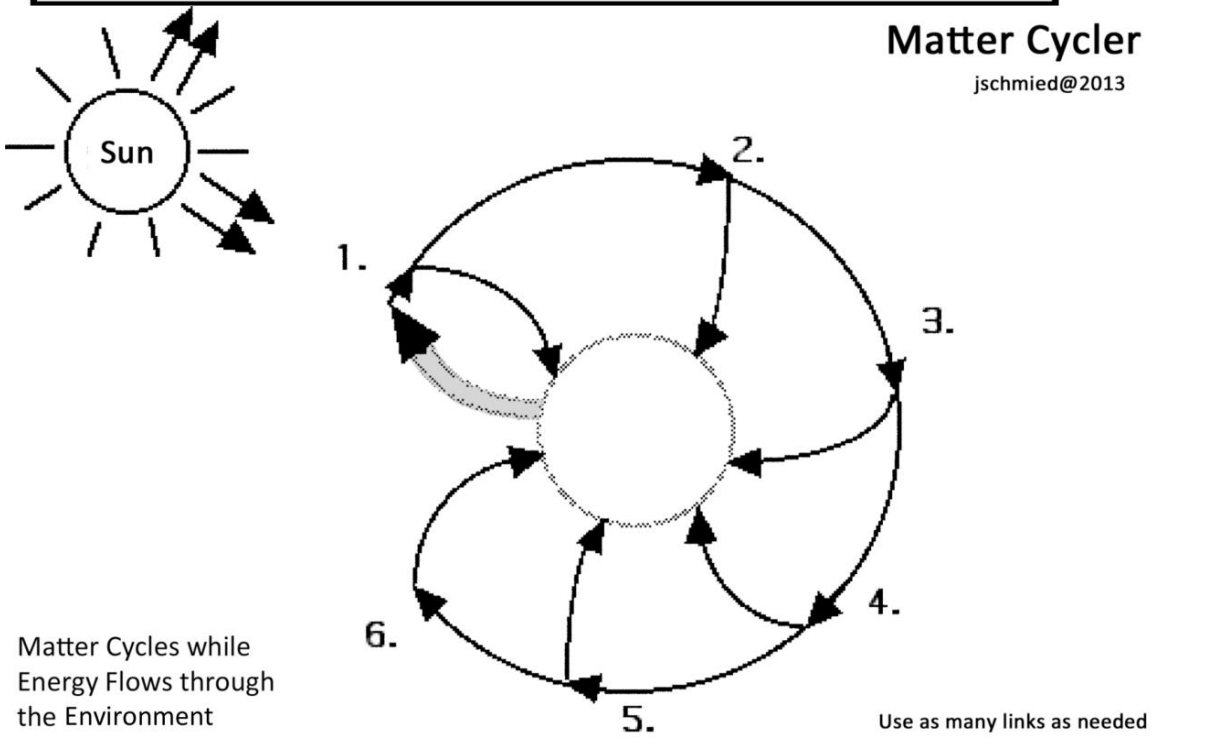
A food web is a series of overlapping food chains, showing how energy moves through an ecosystem.



5. Matter Cycler & Energy Pyramid practice using a Food Chain in the Pac NW Food Web

Energy Pyramids compare the energy available at each trophic level of a food chain in an ecosystem.

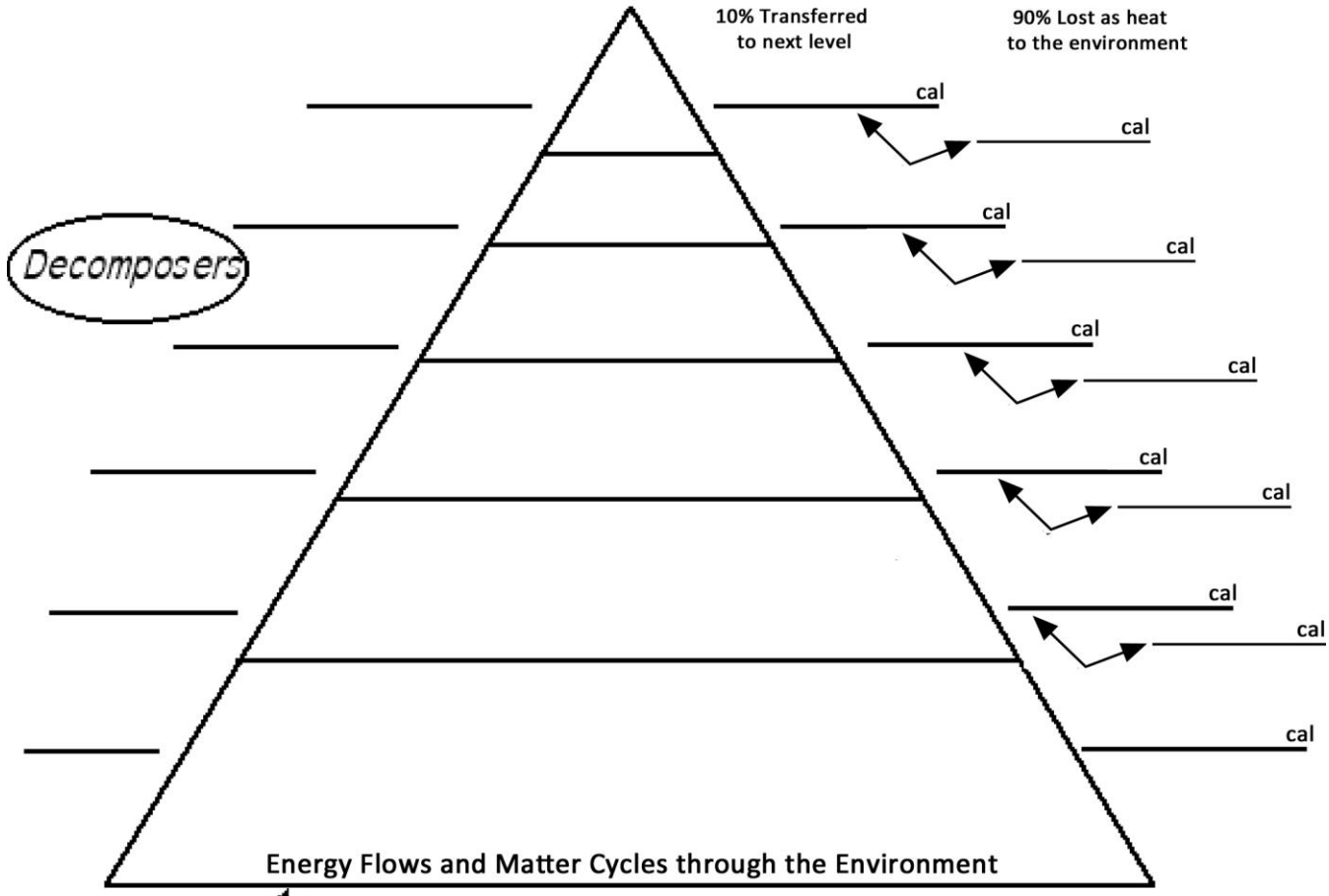




6. Matter Cycler & Energy Pyramid. Use another food chain in the Pac NW Food Web

Energy Pyramid

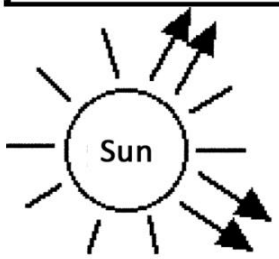
Niche jschmied © 2013 Energy

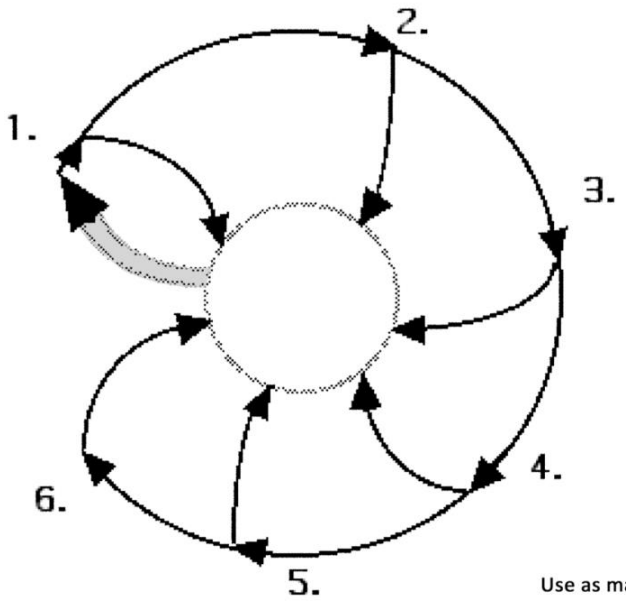


Energy Flows and Matter Cycles through the Environment

Matter Cycler

jschmied@2013

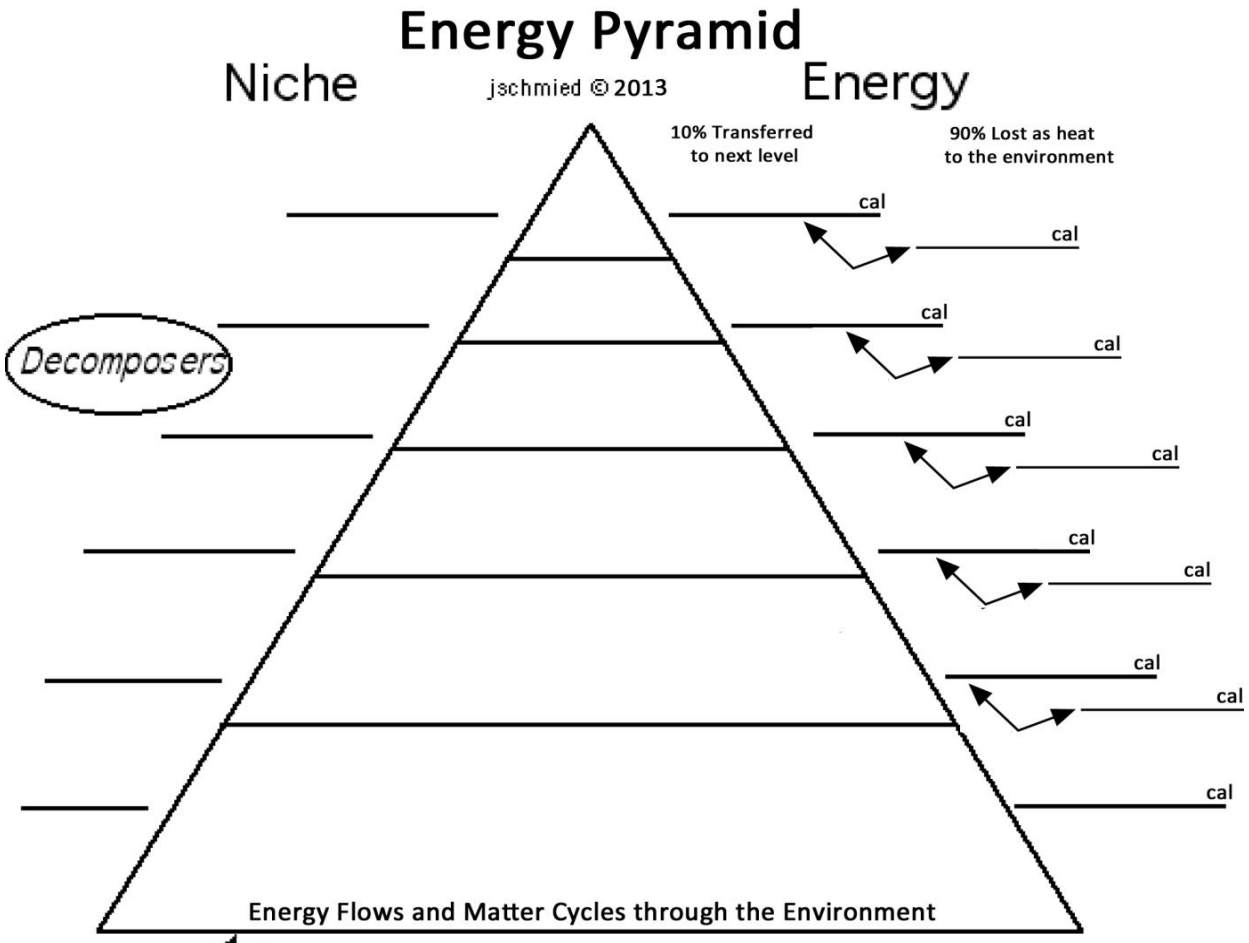


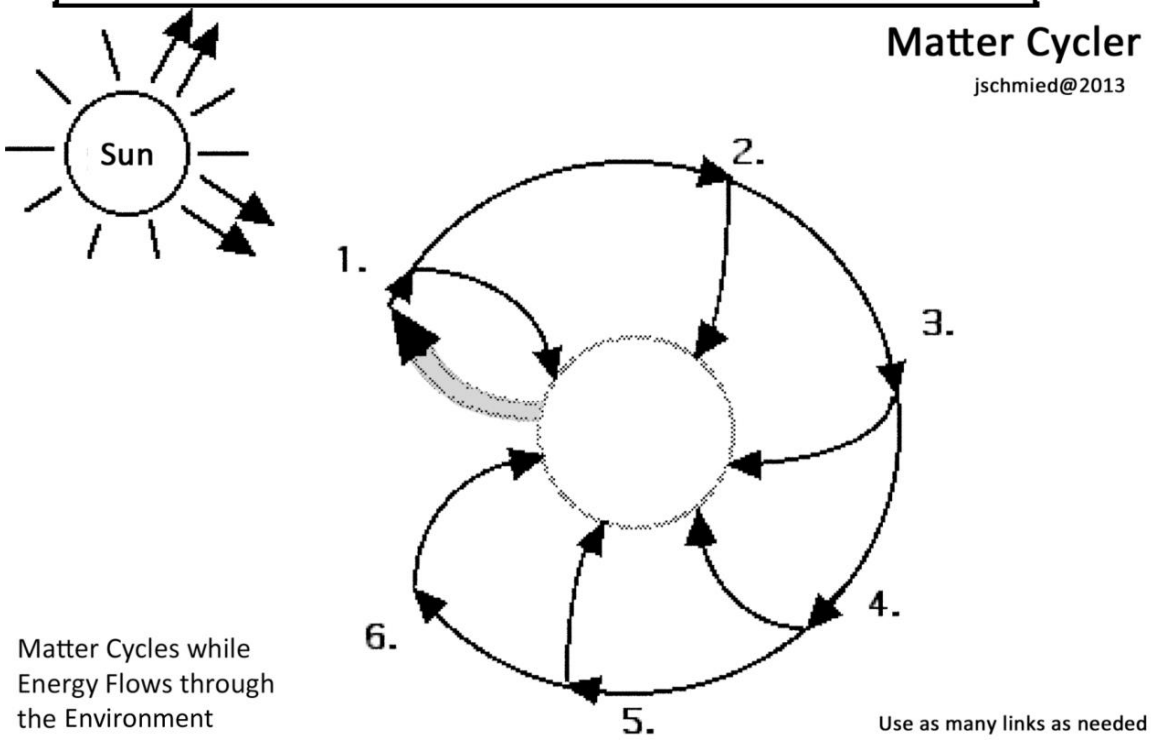


Matter Cycles while Energy Flows through the Environment

Use as many links as needed

7. Matter Cycler & Energy Pyramid. Use another food chain in the Pac NW Food Web





8. Analysis Questions:

Refer to the Pacific Northwest food web to answer these questions.

1. Describe the creatures in the food chain(s) the Greated Horned Owl would eat if it wanted get energy most efficiently? (Start with the Sun => next organism => next organism……)
(This would be the food chain where there would be the least amount of energy lost to the environment .)

2. Describe the creatures in the food chain(s) the Greated Horned Owl would eat if it wanted get energy least efficiently?

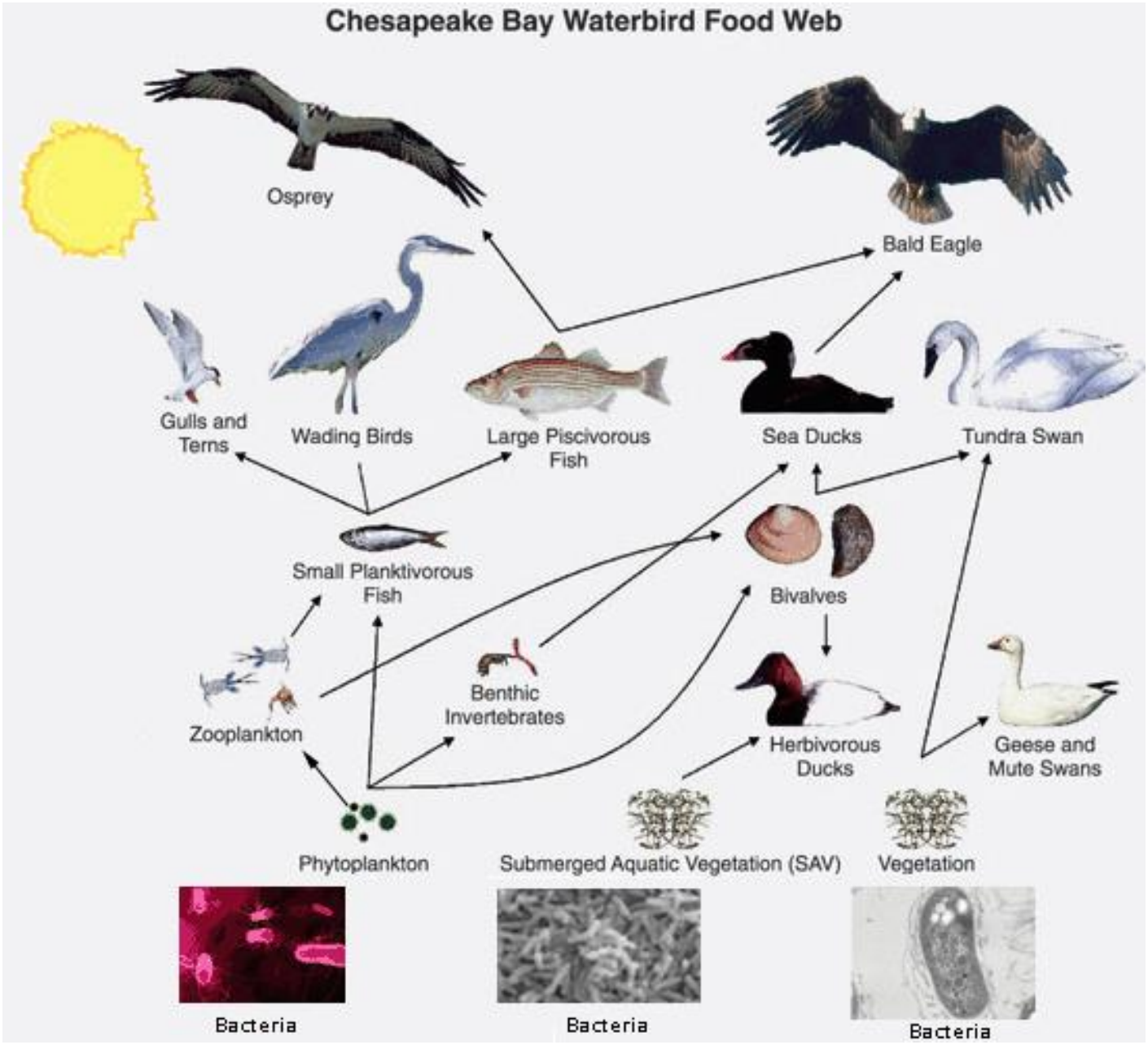
3. (Describe the creatures in the food chain(s) the Coyote would eat if it wanted get energy most efficiently?

4. Describe the creatures in the food chain(s) the Coyote would eat if it wanted get energy least efficiently?

9. Challenge Scenario Level 1 – Chesapeake Bay Waterbird Food Web

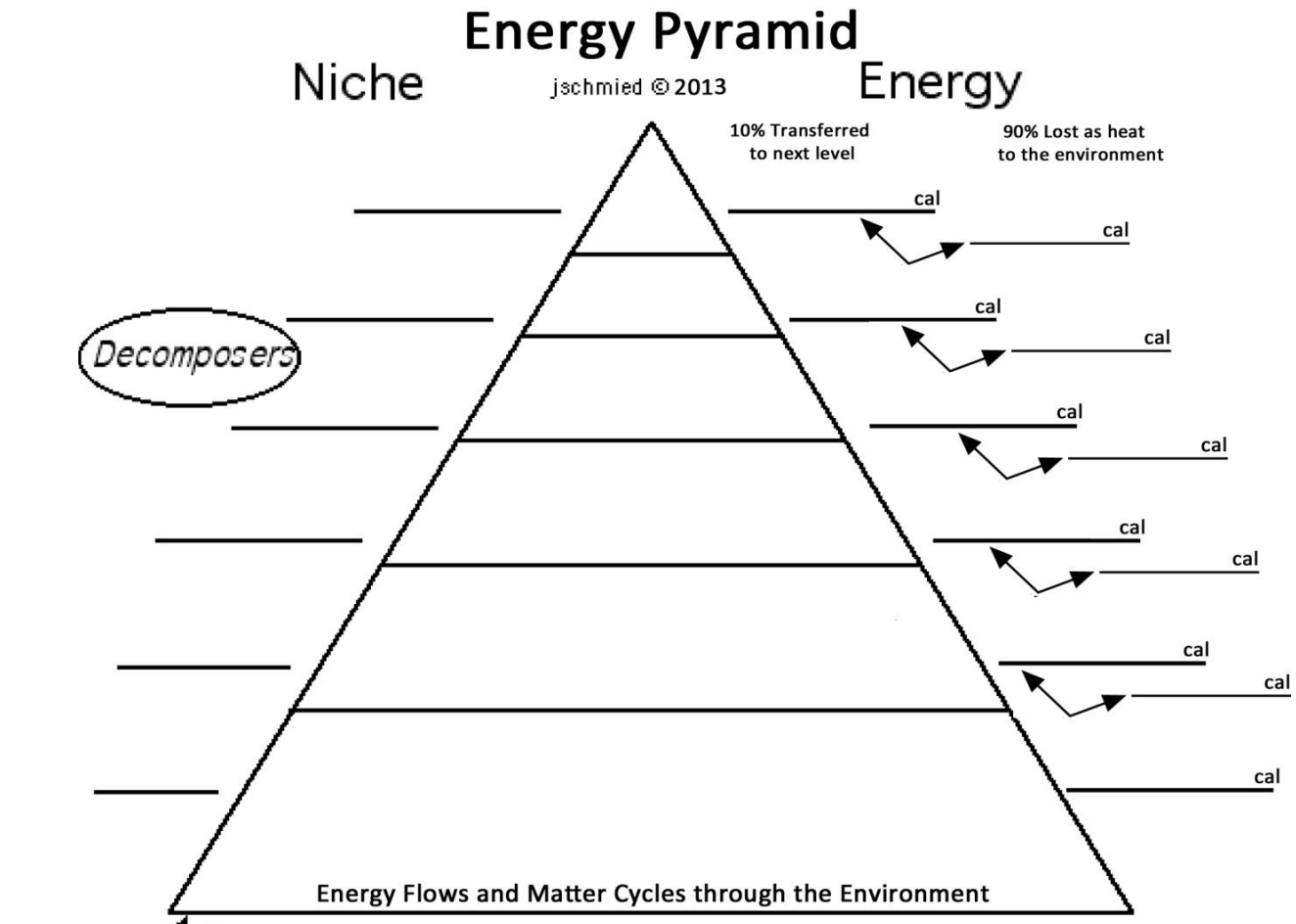
a. **Identify the longest (least efficient) food chain(s) in Chesapeake Bay by marking these in red.**
b. **Identify the (most efficient) food chain in Chesapeake Bay by marking these in green.**
c. **Choose one of the longest food chains in the Chesapeake Bay Waterbird Food Web and create a properly constructed Matter Cycler below, using this food chain.**
d. **Next construct a CQQ Energy Pyramid with this food chain.**

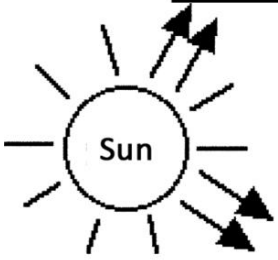
- **Begin with 10,000,000 cals of energy available at the Producer level.**

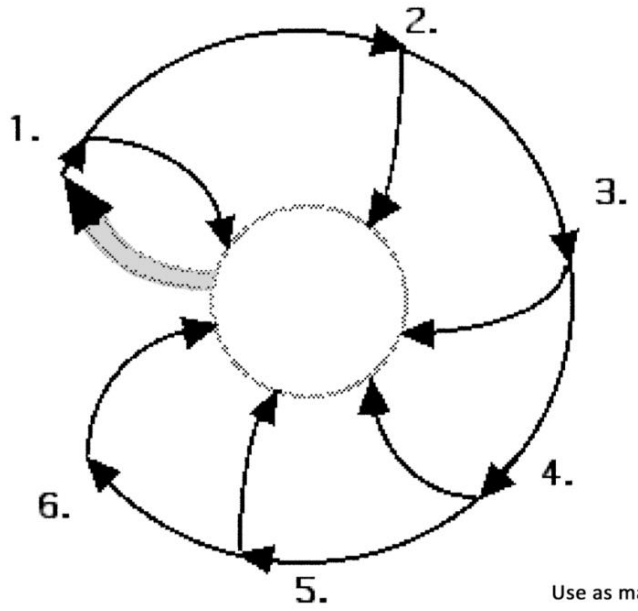


Remember to draw the least efficient food chains in Red and the most efficient food chains in Green!

10. Challenge Assessment Level 1 – Chesapeake Bay Food Web







Matter Cycles while Energy Flows through the Environment

Use as many links as needed

11. Challenge Assessment Scenario Level 2 – Alaskan Food Web

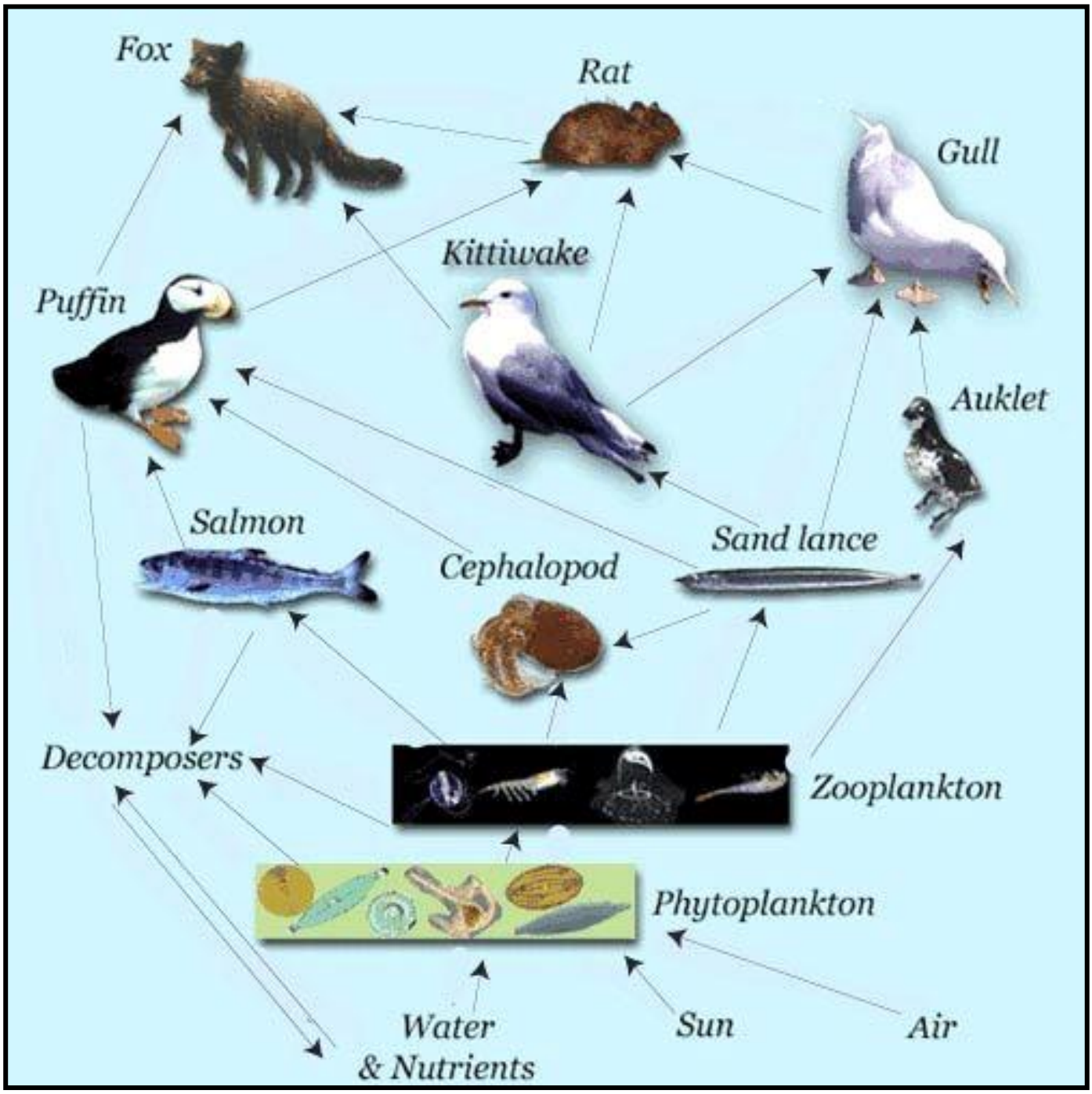
a. Identify the longest (least efficient) food chain(s) in Alaska by marking these in red.

b. Identify the (most efficient) food chain in Alaska by marking these in green.

c. Choose one of the longest food chains in the Alaskan Food Web and create a properly constructed Matter Cycler below, using this food chain.

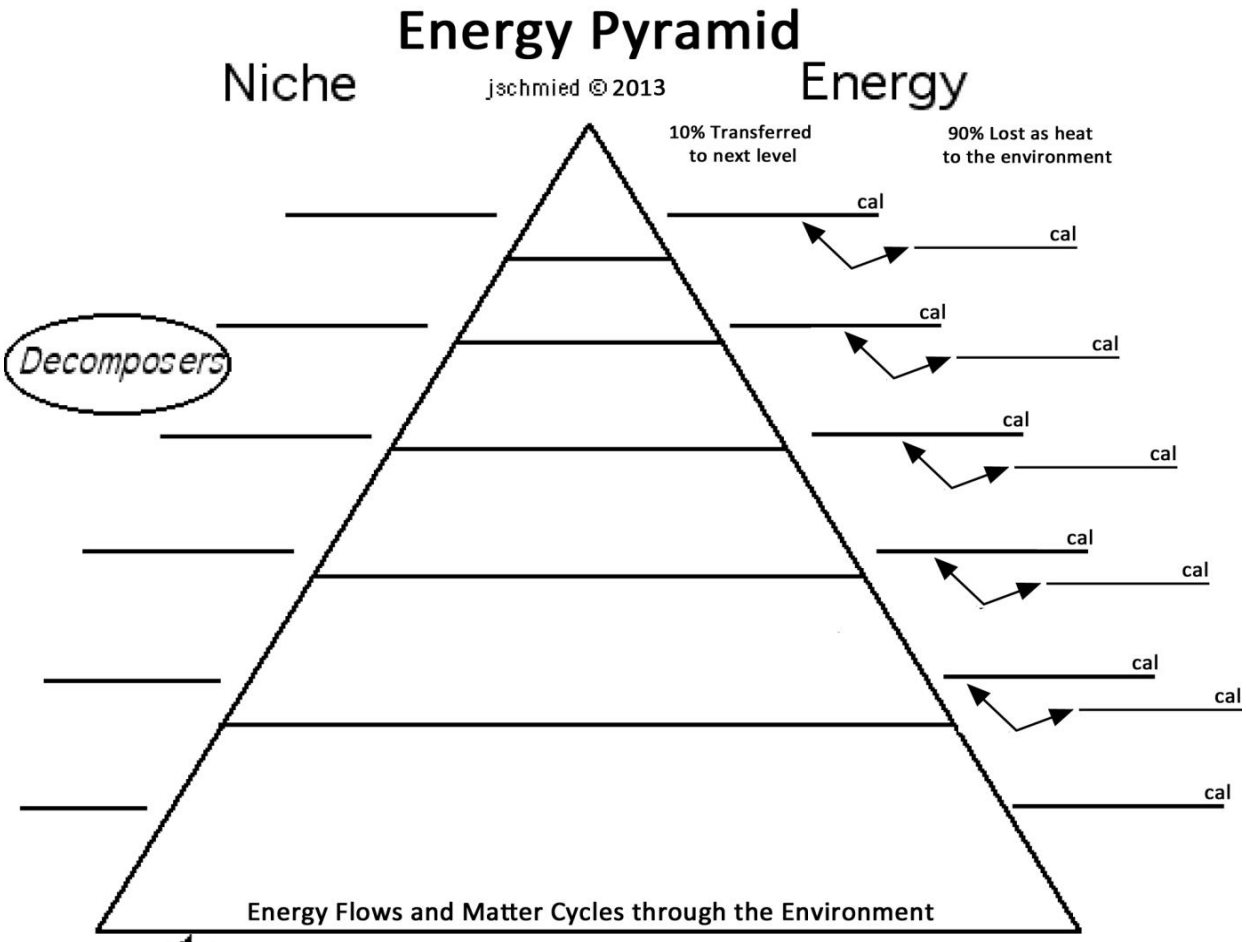
d. Finally construct a CQQ Energy Pyramid with this food chain.

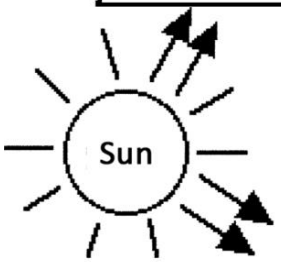
- **Begin with 15,000,000 cals of energy available at the Producer level.**

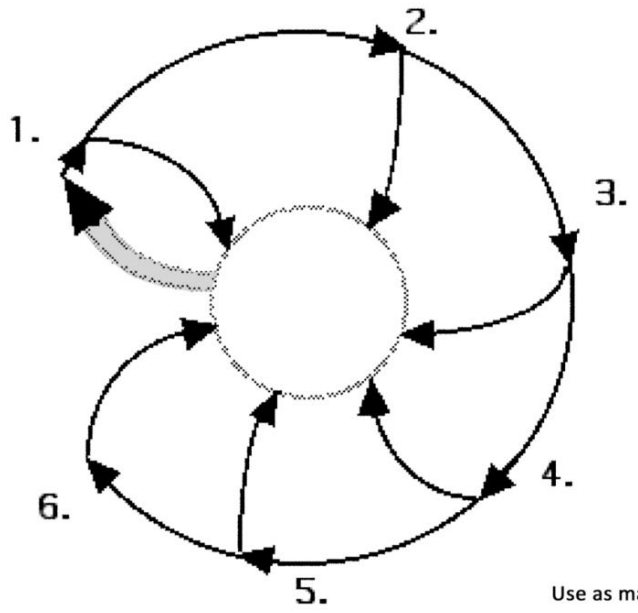


Remember to draw the least efficient food chains in Red and the most efficient food chains in Green!

12. Challenge Assessment Scenario Level 2 – Alaskan Food Web







Matter Cycles while Energy Flows through the Environment

Use as many links as needed