Biology   Name: ________________ and __________________

Class Period: _______ Date: ____________

Ecological Pyramids Virtual Lab activity

http://glencoe.mcgraw-hill.com/sites/dl/free/0078802849/383926/BL_02.html

Place the organisms in the correct trophic levels to complete the pyramids for **3 different ecosystems**. After you have correctly placed all the organisms fill in the data in the tables below for the pyramids of numbers and energy.

Data for Pyramid of Energy

Ecosystem	Primary Consumers (amount of energy)	1st Order Heterotrophs (amount of energy)	2nd Order Heterotrophs (amount of energy)	3rd Order Heterotrophs (amount of energy)
Deciduous Forest				
Hot Desert				
Grassland				
Antarctic Ocean Shore				
Freshwater Lake				

Now you can ask yourself, "how well does the energy transfer from one trophic level to the next?" What you want to know is how much energy is left over from one trophic level to the next. To do this you will complete a "conversion efficiency" between each tropic level. To do this you divide the energy at the higher energy level by the energy at the lower trophic level. This gives you a ratio that you can use for comparison, write your answer as a decimal. Complete this for all three of your ecosystems.

EXAMPLE

$$\frac{\text{1st Order Heterotrophs (amount of energy)}}{\text{Primary Consumers (amount of energy)}} = \frac{\text{744 units of energy}}{\text{7,500 units of energy}} = \mathbf{0.992}$$

Ecosystem	1st Order Heterotrophs (amount of energy) / Primary Consumers (amount of energy)	2nd Order Heterotrophs (amount of energy) / 1st Order Heterotrophs (amount of energy)	3rd Order Heterotrophs (amount of energy) / 2nd Order Heterotrophs (amount of energy)
1.			
2.			
3.			

If you round-off your numbers above which of the following decimal numbers most closely matches ALL your numbers?

A. 0.23   B. 0.10   C. 0.30   D. 0.01

This exercise shows you that _____% of energy from the lower level is available to the next level up. With this information complete the flow chart below that shows how much energy will be found at each level for the generalize ecosystem, (one has been done for you).

Producers
_________ units of energy

Herbivores (1st consumers)
__1000__ units of energy

Omnivores (2nd consumers)
_________ units of energy

Carnivores (3rd consumers)
_________ units of energy

Top Carnivore (4th consumers)
_________ unit(s) of energy

Data for Pyramid of Numbers

Ecosystem	Primary Consumers (# of Individuals)	1st Order Heterotrophs (# of Individuals)	2nd Order Heterotrophs (# of Individuals)	3rd Order Heterotrophs (# of Individuals)
Deciduous Forest				
Hot Desert				
Grassland				
Antarctic Ocean Shore				
Freshwater Lake				

Does the population size increase or decrease at higher trophic levels in the pyramid of numbers for all of your ecosystems? Explain your answer.

____

____

What might happen to an ecological pyramid of numbers in a forest ecosystem if most of the deer were killed due to hunting by people and disease?

____

____

What would happen to an ecosystem if the decomposers disappeared?

____

____

Could there be a food chain without herbivores and carnivores?

____

____