

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)	1 st Order Heterotrophs (amount of energy)	2 nd Order Heterotrophs (amount of energy)	3 rd 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 trophic 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

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

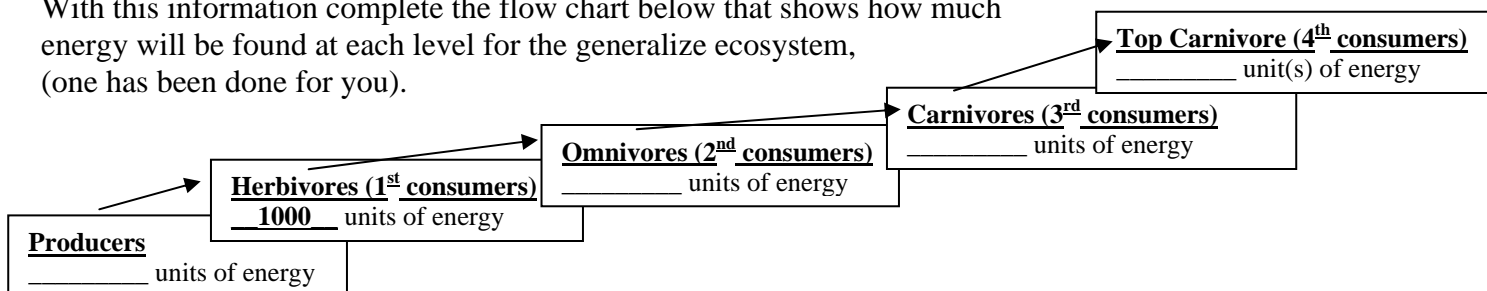
Ecosystem	1 st Order Heterotrophs (amount of energy)	2 nd Order Heterotrophs (amount of energy)	3 rd Order Heterotrophs (amount of energy)
	Primary Consumers (amount of energy)	1 st Order Heterotrophs (amount of energy)	2 nd Order Heterotrophs (amount of energy)
1.			
2.			
3.			

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).



Data for Pyramid of Numbers

Ecosystem	Primary Consumers (# of Individuals)	1 st Order Heterotrophs (# of Individuals)	2 nd Order Heterotrophs (# of Individuals)	3 rd 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?
