

**Science 10 – Ecological Pyramid Activity**

Name:

Date:

- 1) Go to [http://glencoe.mcgraw-hill.com/sites/dl/free/0078802849/383926/BL\\_02.html](http://glencoe.mcgraw-hill.com/sites/dl/free/0078802849/383926/BL_02.html)
- 2) Read through the information in the left hand column labeled “How does energy flow through an ecosystem?” and answer the following questions
  - a. What is the source of energy that fuels most ecosystems?

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- b. What is another term for herbivores?

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- c. What is a trophic level?

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- d. What does a pyramid of energy show you?

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- e. What is the food that consumers eat used for?

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- f. What is a pyramid of biomass?

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- g. How is biomass calculated?

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- 3) A) Follow the procedure of the side for **3 of the ecosystems**. Once you have correctly placed the organisms, record the information for the pyramid of energy below

Ecosystem	Producers (Amount of Energy)	1 <sup>st</sup> Order Heterotrophs (Amount of Energy)	2 <sup>nd</sup> Order Heterotrophs (Amount of Energy)	3 <sup>rd</sup> Order Heterotrophs (Amount of Energy)
Deciduous Forest				
Hot Desert				
Grassland				
Antarctic Ocean Shore				
Freshwater Lake				

Table 1: Data from Pyramid of Energy

- b) Record the information for the pyramid of numbers

Ecosystem	Producers (number of individual)	1 <sup>st</sup> Order Heterotrophs (number of individual)	2 <sup>nd</sup> Order Heterotrophs (number of individual)	3 <sup>rd</sup> Order Heterotrophs (number of individual)
Deciduous Forest				
Hot Desert				
Grassland				
Antarctic Ocean Shore				
Freshwater Lake				

- 4) Using your energy data, calculate the conversion efficiency between the trophic levels. This tells you how much energy was actually transferred from one trophic level to the next. To do this take the energy in the higher trophic level and divide it by the energy in the level just below it. You can convert this to a percent of energy transferred by multiplying the number by 100.

Example:

$$\frac{\text{energy of 1st order heterotrophs}}{\text{energy of producers}} = \frac{992 \text{ units of energy}}{9320 \text{ units of energy}} = 0.1064 = 10.64\%$$

Ecosystem	Conversion efficiency between producers and 1 <sup>st</sup> order heterotrophs	Conversion efficiency between 2 <sup>nd</sup> order heterotrophs and 1 <sup>st</sup> order heterotrophs	Conversion efficiency between 3 <sup>rd</sup> order heterotrophs and 2 <sup>nd</sup> order heterotrophs
1.			
2.			
3.			

5) What do you notice about the amount of energy that is passed from one trophic level to the next?

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6) Using the pyramid of numbers, answer the following questions.

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

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b. What may happen to an ecological pyramid of numbers in a forest ecosystem if most of the rabbits were killed?

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c. Could there be a food chain without herbivores and carnivores?

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