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## **Chapter 3 Worksheet**

*Much of this content is review from middle school life science class. Some of it has already been covered again this year. Use your textbook to thoroughly answer each of the questions.*

1. From page 62 in your textbook, identify the big idea (*a question*) that this chapter will revolve around.

### **Section 1 – What is Ecology?**

2. What is ecology?
3. Contrast biotic and abiotic factors.
4. Identify, in order from most specific to most inclusive, the six levels of ecological organization.
5. Ecology is often a difficult subject to conduct controlled experiments. Identify three common methods of experimentation for ecological studies. Provide an example for each type of study.



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12. Are consumer classifications rigid? Explain your answer.

### *Section 3 – Energy Flow in Ecosystems*

13. Describe how energy moves through an ecosystem.

14. What is a food chain? Provide an example of one. Label each of the levels correctly (*producer, primary consumer, secondary consumer, tertiary consumer, quaternary consumer*). If possible, provide illustrations.

15. On a food chain, what does the direction of the arrow indicate?

16. What is a food web?

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17. Create a food web of Minnesota organisms by using the information below.

- A. Observe the food web examples on pages 75 and 76 in the textbook to get an idea of how to organize the organisms in your web.
- B. At the bottom of this page, arrange the organisms listed below in an orderly manner.
- C. Connect the organisms by correctly drawing arrows between organisms.  
*(links are shown next to the organisms)*

Prairie Grasses - Producer

Oak Tree - Producer

Apples - Producer

Caterpillar - Leaves

Grasshopper - Grasses

Rabbit - Grasses

Mouse - Apples

Deer - Leaves, Grasses, Apples

Woodpecker - Caterpillars, Grasshoppers, Fruit

Red Fox - Caterpillars, Grasshoppers, Small Birds, Apples, Mice, Rabbits, Deer

Black Bear - Apples, Caterpillars, Grasshoppers, Mice, Deer

Praying Mantis - Caterpillars, Grasshoppers, Mice

Falcon - Small Birds, Mice, Caterpillars, Grasshoppers

Snake - Small Birds, Caterpillars, Grasshoppers, Mice, Rabbits

Gray Wolf - Deer, Rabbits, Mice, Snakes

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18. Describe the purpose of ecological pyramids.

19. Contrast the three types of pyramids – energy, biomass, and numbers.

20. Approximately how much of the original energy is able to be passed to the next trophic level within a food web? Identify where the remaining energy is lost. Provide an illustration to clarify your comments.

21. If you are a tertiary (*third-level*) consumer, how much of the original energy is available to you?  
*This requires some math – show your work.*

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*Section 4 – Cycles of Matter*

22. Describe how matter moves through an ecosystem. Contrast this from how energy moves through an ecosystem.

23. Identify the four types of cycles listed in the text.

24. What is the importance of nutrient cycles?

25. How does nutrient availability relate to the primary productivity of an ecosystem?

26. Contrast the usual nutrient limitation in soil versus in an aquatic ecosystem.