**Chapter 55 Reading Guide**

**Ecosystems and Restoration Ecology**

***Sections 1 and 2***

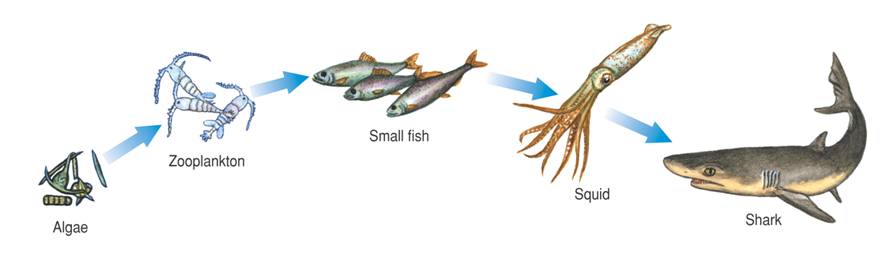
1. What is an ecosystem?

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1. Both energy and matter can be neither \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ or \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
2. What are the three groups of photosynthetic autotrophs?

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1. In the following image, identify each of the five trophic levels present
2. What are detritivores? Name some examples.

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1. How are detritivores important in chemical cycling?

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1. Explain the difference between net primary productivity (NPP) and gross primary productivity (GPP).

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1. Describe the technique used to measure net primary productivity in an aquatic environment.

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1. What is a limiting nutrient?

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1. Name three possible limiting nutrients in aquatic ecosystems?

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1. What is eutrophication? How is it caused?

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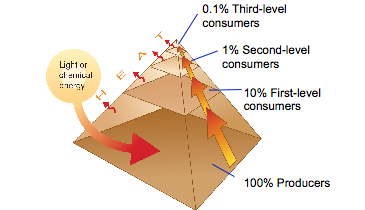
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***Section 3***

1. Define secondary production.

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1. If 50,000 kilocalories of energy are available in the producer level of this energy pyramid, how many calories are available to the tertiary consumers?

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1. Why do people who have limited diets in overpopulated parts of the world eat low on the food chain? What is the advantage?

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***Section 4***

*(For questions 15-18, use key terms from the diagrams on page 1228-1229)*

1. Name four ways/processes that cycle water through the biosphere?

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1. Name four ways/processes that cycle carbon through the biosphere?

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1. Name four ways/processes that cycle phosphorous through the biosphere?

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1. Name four ways/processes that cycle nitrogen through the biosphere.

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1. Write the equations for photosynthesis and cellular respiration below.
2. Define the term transpiration.

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1. Define nitrogen fixation.

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1. Define denitrification.

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***Section 5***

1. Explain bioremediation.

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1. Describe the process of biological augmentation.

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