

Unit One: Ecology

Review Guide

Learning Targets:

Place a checkmark next to the learning targets you feel confident on. Then go back and focus on the learning targets that are not checked.

Biosphere

- Distinguish between biotic and abiotic factors in the environment. (1.1A)
- Arrange the levels of organization within the biosphere. (1.1 B)
- Explain how energy flows through an ecosystem. (1.2A)
- Calculate the flow of energy from one trophic level to another. (1.2B)
- Interpret a food chain or food web. (1.2C)

Ecosystems

- Create a model describing how matter cycles through the biosphere. (1.3A)
- Distinguish between an organism's niche and habitat. (2.1A)
- Classify community members as a producer or type of consumer. (2.1B)
- Identify and contrast biological relationships (predator-prey and symbiotic). (2.1C)
- Describe biotic and abiotic factors of terrestrial biomes. (2.2A)

Populations

- Compare and contrast logistic and exponential growth models. (3.1A)
- Identify examples of populations that demonstrate different types of growth. (3.1B)
- Identify factors that affect population growth. (3.2A)
- Predict the effects of limiting factors on population growth. (3.2B)

Biodiversity

- Examine the importance of protecting and conserving biodiversity. (4.1A)
- Predict the impact of a specific threat to the biodiversity of an ecosystem. (4.1B)
- Describe how keystone species maintain biodiversity. (4.1C)

Textbook Sections:

- | | |
|-----------|---------------------------------------|
| Chapter 3 | The Biosphere (3.1-3.4) |
| Chapter 4 | Ecosystems and Communities (4.2, 4.4) |
| Chapter 5 | Populations (5.1-5.3) |
| Chapter 6 | Humans in the Biosphere (6.1-6.4) |

**Test Friday:
October 3rd, 2014**

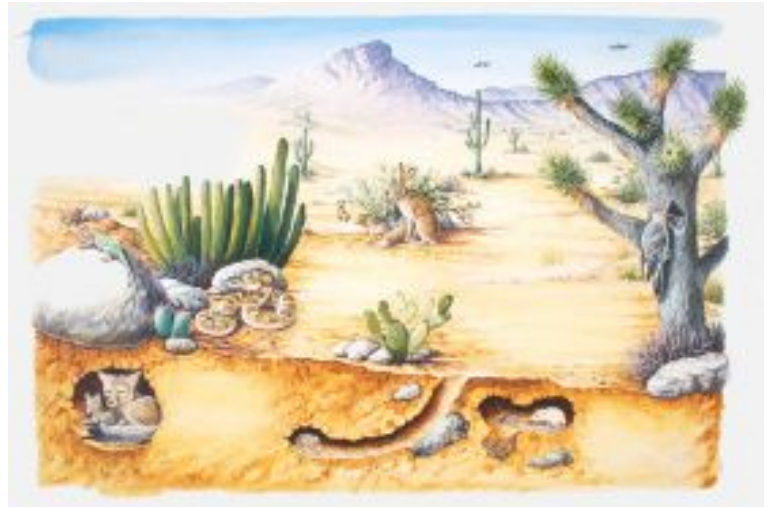




Distinguish between biotic and abiotic factors in the environment. (1.1A)

What is the difference between an abiotic factor and a biotic factor?

Look at the diagram to the right, list all the biotic and abiotic factors pictured.



Arrange the levels of organization within the biosphere (1.1B)

Label the following diagram using the 6 levels of organization of the biosphere.



Describe each of the levels of organization, pay special attention to what separates one level from the next.

Biosphere

Biome

Ecosystem

Community

Population

Individual



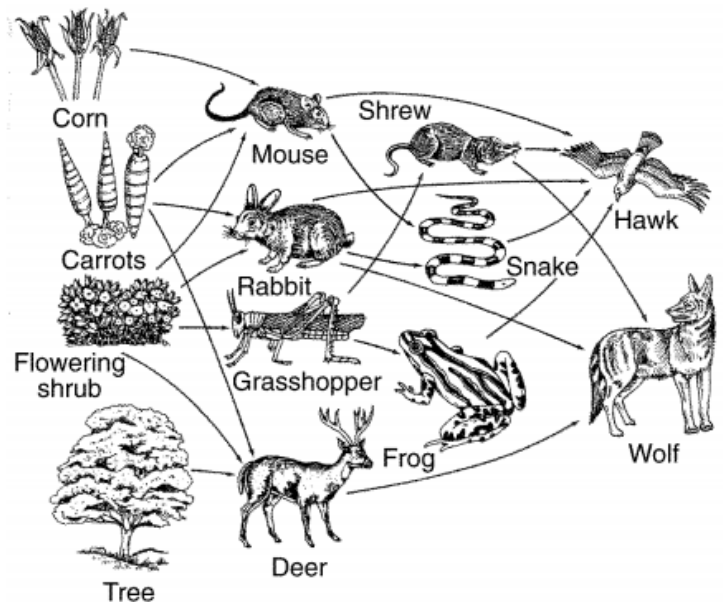
Explain how energy flows through an ecosystem (1.2A)

Use the figure to the right to answer the following questions.

Is this a food web or a food chain?

As an Ecologist, which would be more useful to you in determining energy flow in an ecosystem, a food web or a food chain? Why?

By what mechanism is energy transferred in an ecosystem?



What direction does energy flow in an ecosystem (use terms such as autotrophs, heterotrophs, producers, and consumers).

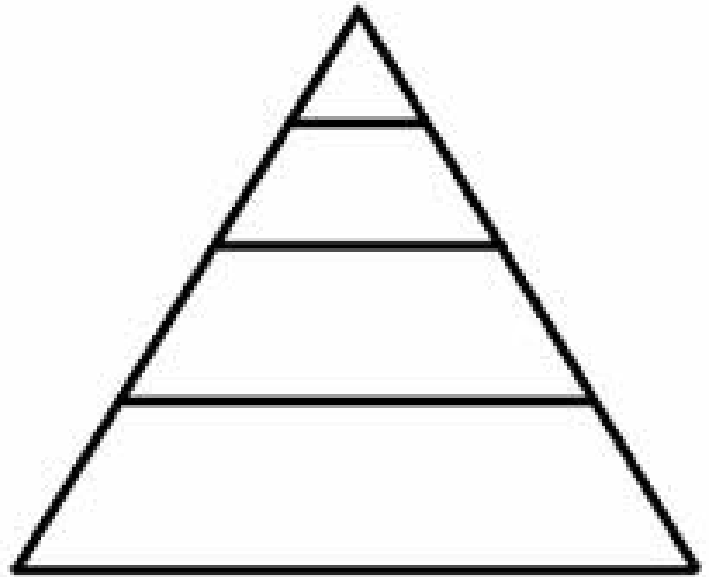


Calculate the flow of energy from one trophic level to another. (1.2B)

Fill in the energy pyramid below with the correct type of organisms you would expect to see at each level in any type of ecosystem.

Draw an arrow to represent how energy moves through the pyramid.

If an organism in the lowest section has 200 energy units, how much energy would an organism in the next level have?



What is the name of the rule that describes how energy moves through an ecosystem? Explain what is meant by this rule.



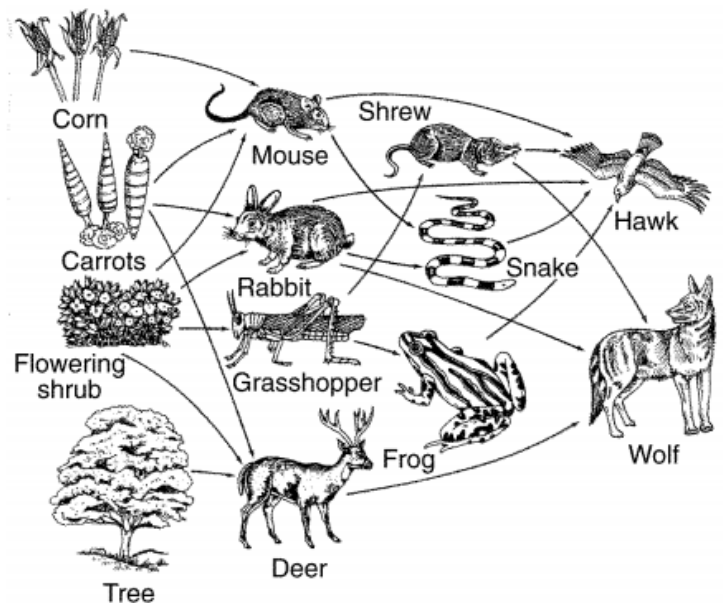
Interpret a food chain or food web (1.2C)

Use the figure to the right to answer the following questions.

Based only on the information in this figure, is the deer a herbivore, omnivore, or a carnivore?

Based only on the information in this figure, is the snake a herbivore, omnivore, or carnivore?

Color all of the producers in this figure yellow, all of the primary consumers blue, and all of the secondary consumers green.



In what way are herbivores and carnivores alike?

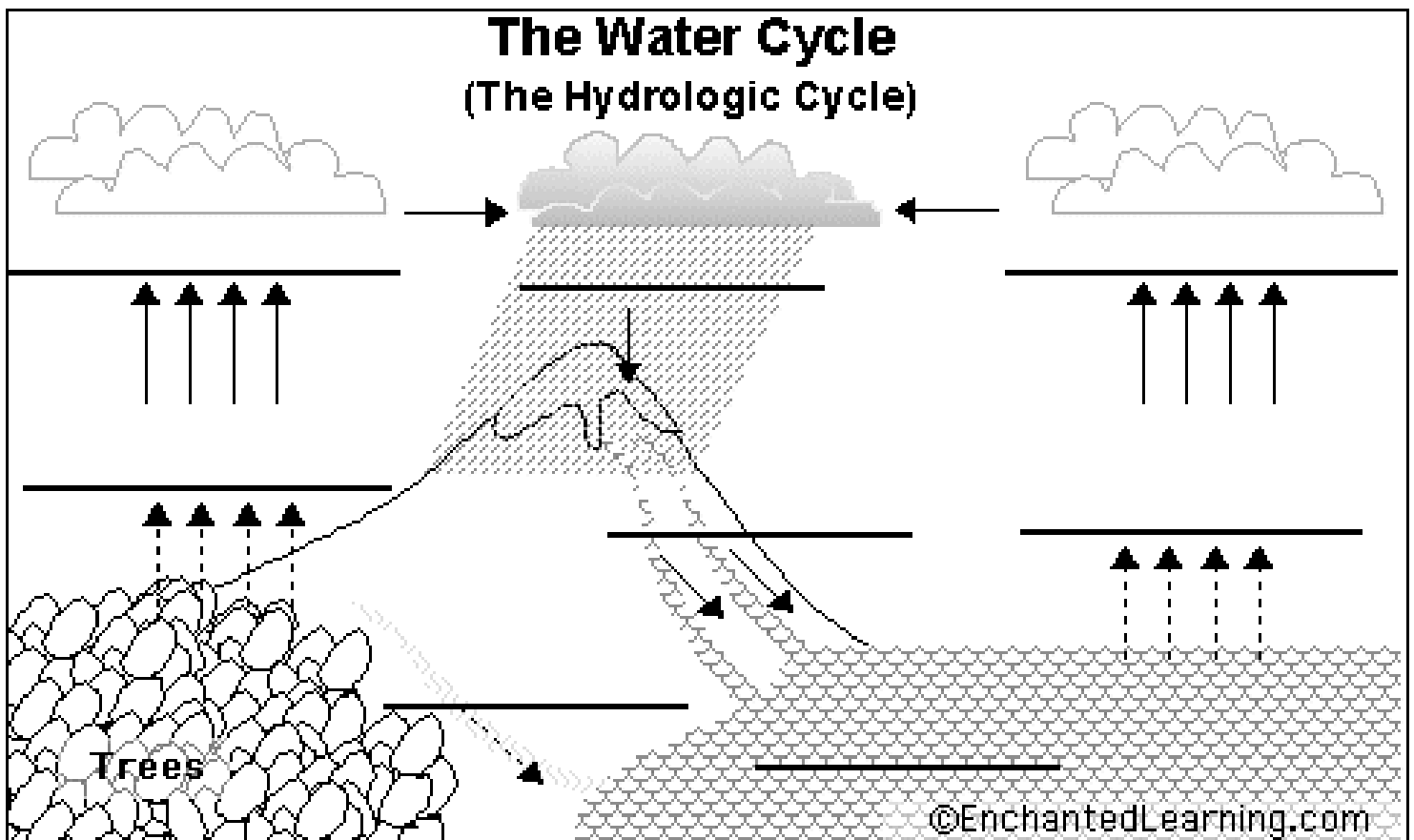
What do the arrows represent in a food web or a food chain?

If grasshoppers were removed from the above food web what changes in the ecosystem would you expect to see?



Create a model describing how matter cycles through the biosphere. (1.3A)

Label the following diagram using correct scientific terminology.



What is the difference between transpiration and evaporation?

Using the diagram above to help you, describe how carbon is cycled throughout the biosphere.

How are the carbon cycle and water cycle similar?

Can water molecules or carbon atoms ever be destroyed?



Distinguish between an organism's niche and habitat. (2.1A)

What is the difference between a niche and a habitat?

Pick two organisms- list their habitats and their niches.

**Classify community members as a producer or type of consumer (2.1B)**

Fill in the chart below

Type of Community Member	Definition	Example
Primary Producers		
Primary Consumers		
Secondary Consumers		
Decomposers		
Scavengers		

What is another term we can use to describe primary producers?

What is another term we can use to describe consumers?



Identify and contrast biological relationships (predator-prey and symbiotic). (2.1C)

What are the three types of symbiotic relationships that we discussed?

Put the letter (**M,C,P**) by the statement that best describes the type of symbiosis.

- ___ 1. A tick living on a dog.
- ___ 2. The honeyguide bird leading the honey badger to the bees hive, both eat the honey.
- ___ 3. A tapeworm living in a person's intestines.
- ___ 4. A bird building their nest in a tree.
- ___ 5. The hermit crab carrying the sea anemone on its back.
- ___ 6. The bristle worm living with the hermit crab.
- ___ 7. Head lice living on a human scalp.
- ___ 8. The egret, an insect eating bird, graze near some herbivores mouth.
- ___ 9. Orchids growing in tall tropical trees, the trees are not harmed but the orchids get sunlight.
- ___ 10. Bacteria living on a human's skin.
- ___ 11. The remora hitching a ride on a shark.
- ___ 12. Barnacles living on a whale.
- ___ 13. Bees and a flower.
- ___ 14. Bacteria living in the intestines of a cow to help it break down cellulose.



Describe biotic and abiotic factors of terrestrial biomes. (2.2A)

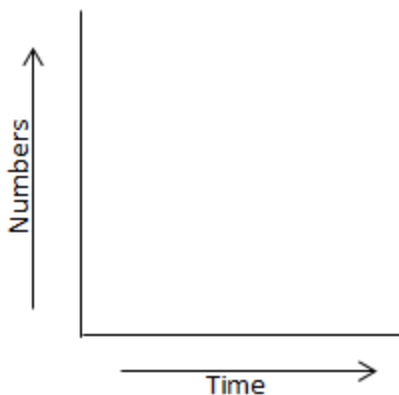
Biome	Precipitation and Temperature	Biotic Factors
Tundra		
	cold with mild summers and adequate rainfall	
		squirrels, oak trees, deer, maple trees
Rainforest		
	warm, distinct wet and dry season	
		cactus, coyotes, rattlesnakes
	cool and warm season, adequate rainfall	lush grass, prairie dogs, buffalo, deer



Compare and contrast logistic and exponential growth models. (3.1A)

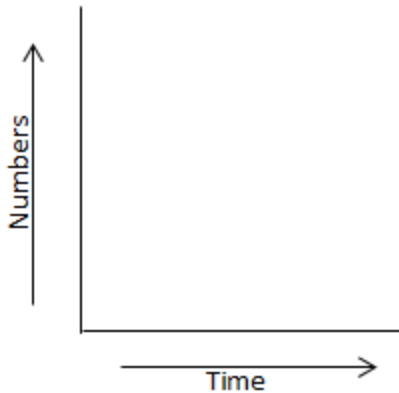
When does exponential population growth happen?

Complete the graph below by drawing the characteristic shape of exponential population growth.



When does logistic population growth happen?

Complete the graph below by drawing the characteristic shape of logistic population growth.



Identify examples of populations that demonstrate different types of growth. (3.1B)

List one example of a population that may experience exponential growth.

What type of growth did you see in the Kaibab lab?

If a species is introduced to a new environment, where food sources are readily available and there are no natural predators what type of growth would you expect to see? Explain your answer.



Identify Factors that affect population growth (3.2A)

Describe what a density-dependent limiting factor is.

What are examples of density-dependent limiting factors?

Describe what a density-independent factor is.

What are examples of a density-independent factor?

What are some examples of other limiting factors?



Predict the effects of limiting factors on population growth. (3.2B)

How can limiting factors impact population growth?

What would you expect to happen to the population growth of a particular organism if the food supply were to disappear?

Can limiting factors determine how many organisms an environment can hold? Explain.

What is carrying capacity?

What determines the carrying capacity of a specific environment?



Examine the importance of protecting and conserving biodiversity. (4.1A)

What are the primary benefits of biodiversity on our society?



Predict the impact of a specific threat to the biodiversity of an ecosystem. (4.1B)

What is an invasive species?

List one example of an invasive species.



Describe how keystone species maintain biodiversity. (4.1C)

What is a keystone species?

Explain why the wolves in Yellowstone National Park are considered a keystone species.

Compare and contrast an invasive species to a keystone species (what are the similarities and differences?)

Important Vocabulary Words:

Population
Keystone Species
Symbiosis
Omnivore
Community
Food Chain
Decomposer
Niche
Abiotic
Limiting Factor
Parasitism
Biosphere
Consumer
Biome
Food Web
Heterotrophs
Carrying Capacity
Autotroph
Scavenger
Mutualism
Herbivores
Habitat
Ecosystem
Biotic
Carnivore
Commensalism

**You will want to make sure that you go back through and look at all labs, practice worksheets, videos/video notes, class activities, and class notes.

**Test questions can come from anything we discussed or completed in class!