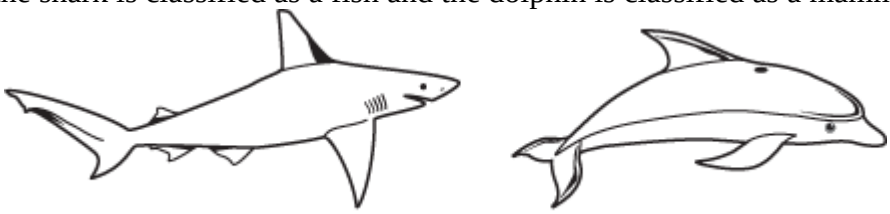
Name: _____ Date: _____ Period: ____

Practice Questions for Unit Review

Use the information below to answer question 1.

The sandbar shark and the bottlenose dolphin pictured below live in water. Though the animals look similar, the shark is classified as a fish and the dolphin is classified as a mammal.



Sandbar shark

Bottlenose dolphin

1. Which statement <u>best</u> supports classifying the shark as a fish and the dolphin as a mammal?

   A. One gets energy from sunlight; the other gets energy from food.
   B. One has several fins on the belly; the other has no fins on the belly.
   C. One breathes using gills; the other breathes through a blowhole and lungs.
   D. One has eyes on the front of the head; the other has eyes on the side of the head.

Use the information below to answer question 2.

The Hawaiian Islands are home to some of the most studied volcanoes on Earth. The volcanoes erupt often but are seldom explosive because of the magma that they produce. Kilauea volcano is located on the largest of the Hawaiian islands and rises over 4,200 feet above sea level. Kilauea has been erupting continuously since 1983 and has resulted in new landmass.

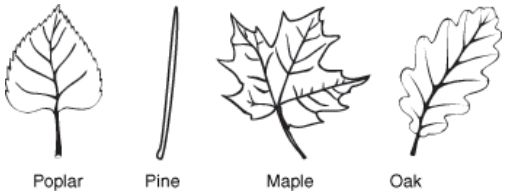
A fossil found in a surface rock layer is of the same species as a fossil found in a deeper rock layer. However, the two fossils differ slightly in structure.

2. Differences in the structures of the fossils indicate that

   A. this species changed over time
   B. this species had many predators
   C. the life span of this species changed
   D. the food supply of this species changed

Use the information to answer question 3.

The picture shows four leaves, each from a different tree.



3. Which leaf is best adapted to a dry environment?

A. poplar
B. pine **(the other leaves clearly have vascular systems; because the pine needle does not have a**
C. maple **vascular system, we can conclude that they are well adapted to a dry environment.**
D. oak

Use the information below to answer question 4.

As shown in the drawing, snowshoe hares have thick white fur in the winter and thin gray fur in the summer. Changing fur color with the season provides a certain advantage to these animals.

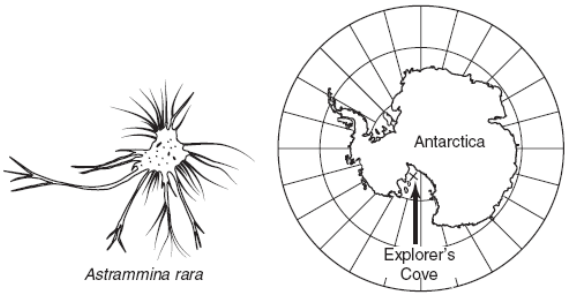
Snowshoe Hare in Winter Snowshoe Hare in Summer

4. The advantage of changing fur color is that it

A. helps hares to attract a mate
B. allows hares to build soft dens
C. helps hares to sneak up on prey
D. allows hares to blend with the environment

Use the information and diagrams to answer the following.

Astrammina rara is a unicellular organism that is several millimeters long. This organism lives on the ocean floor of Antarctica in an area called Explorer's Cove. *Astrammina rara* builds a shell by cementing grains of sand from the ocean floor together. The organism either absorbs nutrients from the water or eats other organisms on the ocean floor. The offspring of *Astrammina rara* have genes identical to the parent. Below is a diagram of an *Astrammina rara* and a map showing where the organism lives.



Astrammina rara

(not drawn to scale)

5. Which of the following reasons best explains why *Astrammina rara* builds a shell?

A. to grind food
B. to attract a mate
C. to absorb sunlight
D. to blend with the ocean floor

Use the information below to answer questions 6-8.

Bald eagles are found in and near desert, mountain, freshwater, and marine environments throughout the United States. Bald eagles build huge nests that are usually in treetops, near areas of water. The main food source for bald eagles is fish, but the birds sometimes eat other small animals. In 1967, the bald eagle was listed as an endangered species by the Environmental Protection Agency. The widespread use of DDT was responsible for the decline in the number of eagles. DDT, a chemical commonly used to control mosquitoes, caused thinning of the eagle egg shells.

The data table below shows how the population of breeding pairs of bald eagles has changed over a 12-year period in several states.

BREEDING PAIRS OF BALD EAGLES BY STATE

State	Year 1	Year 3	Year 6	Year 9	Year 12
Maryland	123	154	201	260	319
Massachusetts	5	9	10	11	12
Michigan	174	246	287	334	405
Nebraska	0	2	10	13	29
Nevada	0	0	0	2	1

6. Which statement is the most likely reason for the large difference in the number of breeding pairs in Maryland and Nevada?

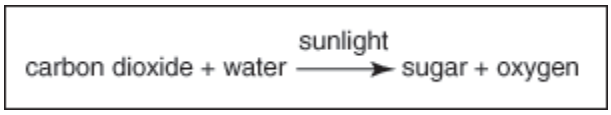
   A. There are fewer trees in Maryland.
   B. There are more fish in Nevada.
   C. There are more open waters in Maryland.
   D. There are fewer small animals in Nevada.

7. Which statement best explains why habitats in Michigan and Maryland support more breeding pairs than habitats in other states?

   A. Cropland provides grain for food.
   B. Large lakes and rivers provide food.
   C. Mountains provide fewer places to hunt.
   D. Grasslands provide homes for large animals.

8. In which year did all states show an increase in the number of breeding pairs?
   A. Year 3
   B. Year 6
   C. Year 9
   D. Year 12

Use the chemical equation below to answer the following.



9. What process is represented by the chemical equation above?

   A. how plants make food
   B. how plants digest food
   C. how animals make food
   D. how animals digest food

Use the information below to answer question 10.

Fossils of tree ferns as old as 400 million years have been found in rocks. These ancient ferns lived in swampy, lowland forests and reproduced asexually by producing spores. The ferns were much taller than other plants living at the same time. These extinct tree ferns have modern-day relatives that grow in the tropics.

Ancient ground plants competed with ancient tree ferns for resources in swampy areas.

10. For which resource were the tree ferns best able to compete?
    A. air
    B. shelter
    C. sunlight (because tree ferns are much taller than other plants living at the time)
    D. water

11. Leaf cells are one type of tree cell.

    Which process occurs in a growing leaf cell?

    A. evolution
    B. adaptation
    C. sugar production(glucose…from the process of photosynthesis)
    D. sexual reproduction

12. Biologists conduct investigations to learn about living organisms.

Which method helps reduce bias during an investigation?

A. developing a hypothesis after collecting data in the investigation
B. limiting the amount of background research before the investigation
C. designing an investigation with repeated trials during the investigation
D. obtaining other opinions concerning what should happen during the investigation

13. Clams, oysters, and mussels eat plankton filtered from water.

How would clams, oysters, and mussels most likely be affected if the amount of plankton in a large body of water was significantly reduced?

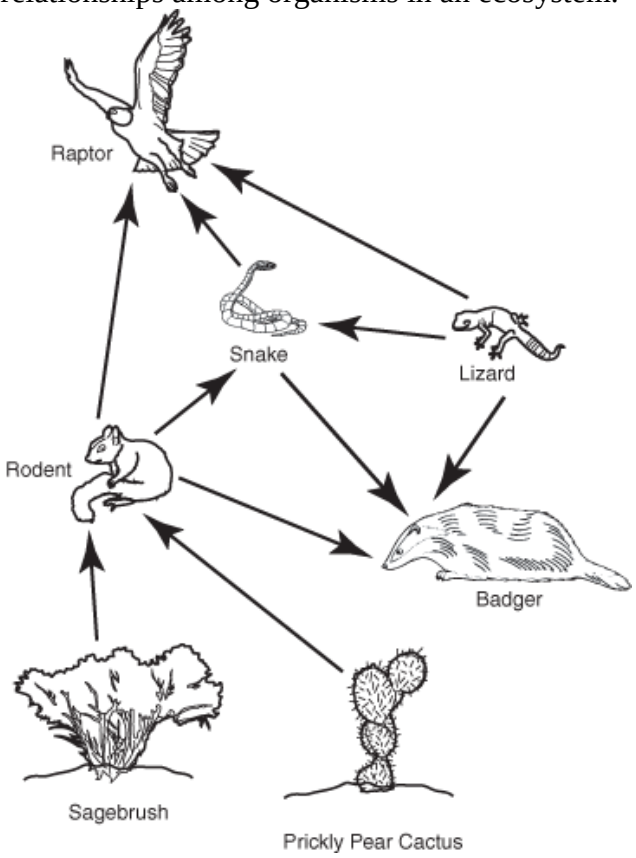
A. They would increase in number.
B. They would find a new food source.
C. They would become prey to other animals.
D. **They would compete for a limited food source**.

Name: _____

Date: _____ Period: ____

BCR

The diagram shows the relationships among organisms in an ecosystem.



Explain how organisms in this ecosystem compete for resources. In your explanation, be sure to include

- the animals that compete for the same food source
- why the plants and animals compete for water

A sample student answer is on the next page.

Animals in this ecosystem compete for resources. First of all, the plants and animals all have to compete for water; without water, organisms cannot survive. Second, animals of different species must compete for food. The snake, badger, and the raptor all must compete to eat the rodent and the rat. The raptor and the badger must compete to eat the snake. There is also competition between animals of the same species. For example, all of the raptors must compete against each other for the rodents, snakes, and lizards. In every ecosystem, each animal must compete to survive.

Name: _____

Date: _____ Period: ____

Use the technical passage below to answer question 14 and the BCR.

The Good, the Bad, and the Algae

While the name "algae bloom" might sound like something pretty and delicate, algae blooms are not sweet-smelling flowers that blossom in the Chesapeake Bay. In fact, they have much to do with the nature of algae and the way people use the land around them.

What Are Algae Blooms?
When nutrients are present in excessive amounts, algae grow rapidly. Their numbers can double in a day. Population explosions of algae are known as blooms.

Because different species thrive as waters vary from warm to cold and fresh to salty, algae blooms occur throughout the Bay and throughout the year. However most blooms appear in summer, when sunlight and nutrients are plentiful.

Depending on the species, blooms can form scum, clumps or mats that float near the surface or grow on the bottom. Blooms in the Chesapeake are most often greenish, red, or brown.

How Are Blooms Harmful?
While higher organisms–such as zooplankton, clams, oysters, minnows and menhaden–eat algae, blooms provide a large surplus of food. Some species low in nutritional value can weaken the organisms that eat them. When algae die, they sink to the bottom. Their decomposition uses more oxygen than they produced when living. The grim result is that blooms rob water of the dissolved oxygen that fish, shellfish, and other aquatic creatures need to survive. Blooms block the sunlight needed by bay grasses, which produce oxygen and provide habitats for fish and shellfish. Some blooms produce poisonous substances called toxins. Toxins can weaken or kill fish, harm land animals that drink
contaminated water, and cause skin irritations and stomach problems in humans.

How Can We Control Blooms?
Restoring forests and wetlands is a way to reduce the flow of nutrients into waterways. The trees and vegetation soak up nutrients much like a sponge, acting as nutrient-storage devices. Planting forested or vegetative buffers along waterways also helps slow runoff, allowing more nutrient-laden water to filter through the ground. Restoring populations of algae-eating organisms, particularly oysters and menhaden, is yet another important way to counteract algae blooms in the Chesapeake.

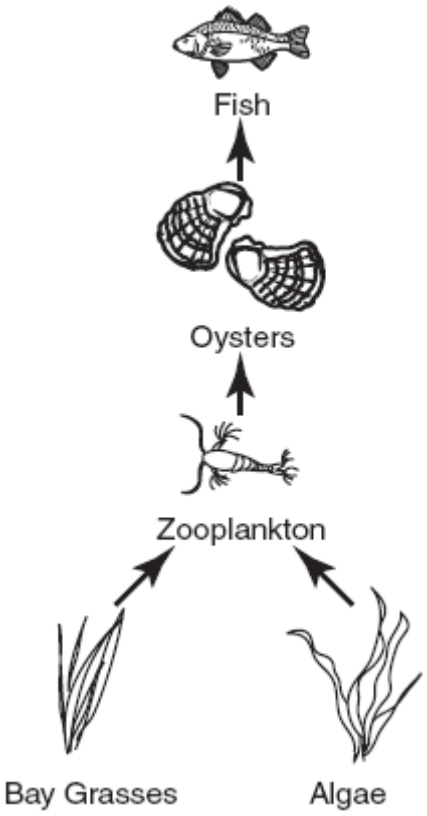
14. Why might the animals in a bay be affected by large numbers of dead algae?

A. The animals have less oxygen.
B. The animals have less nutrients.
C. The animals are at risk of algal infections.
D. The animals are at risk of freezing in the winter.

During one year the algae population decreases in the Chesapeake Bay. Below is a partial Chesapeake Bay food chain.

Explain how a large decrease in the algae population will most likely impact the bay ecosystem.
In your explanation, be sure to include

- the roles of the organisms in the partial Chesapeake Bay food chain
- the possible effects of a decrease in the algae population on the plant and animal populations



This is a sample student answer:

At the bottom of the food chain is bay grasses and algae. Zooplankton eat those, oysters eat zooplankton, and fish eat oysters. If there was no bay grasses or algae, then the zooplankton would starve to death, then the oysters would also starve since there would be no zooplankton, and finally, the fish would die out because there would be no oysters. If the algae population is decreased then a couple tings could happen. First, the amount of bay grasses could increase since they wouldn't have to fight for sunlight anymore. Or, the total amount of food for zooplankton could decrease, since half of the food source would be almost gone, and cause the domino effect of all of the organisms dying. Lastly, if there was less algae, then the water would be cleaner, so less organisms would die, and the food chain could go on without any troubles.

Name: _____

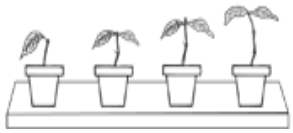
Date: _____ Period: ____

Use the information below to answer questions 15-16.

In a lab study, eight bean plants are grown from seeds in individual containers. After a few leaves are visible on each plant, the plants are separated into two groups. One group is placed in a room that gets sunlight, and the other group is placed in a dark room. All of the plants receive the same amount of water daily. After two weeks, the plants are observed.

PLANTS GROWN IN SUNLIGHT

PLANTS GROWN IN DARK ROOM



OBSERVATIONS		
Plant Feature	**Plants Grown in Sunlight**	**Plants Grown in Dark Room**
Leaves	Dark green	Light yellow
Stem	Green and sturdy	Yellow and wilted
Average Plant Height	30 cm	18 cm

15. Plants use energy from the sun to convert

A. sugars to oxygen and water
B. oxygen and water to sugars
C. carbon dioxide and water to sugars
D. sugars to water and carbon dioxide

16. All the plants in this investigation were bean plants because

A. the plants were the same color
B. plant type was not a tested variable
C. each plant received the same amount of sunlight
D. a different amount of water was not used for each plant

17. Some volcanic eruptions release so much ash into the air that the amount of sunlight reaching the surface of Earth is reduced.

Which requirement for plant growth would be greatly reduced after such an eruption?
A. carbon dioxide
B. energy
C. oxygen
D. water

Name: _____

Date: _____ Period: ____

Use the information below to answer the following.

Environmental scientists are studying a preserved wetland ecosystem and the effect of human population growth on that wetland. The scientists used the information below to develop an educational program.

FEATURES OF A WETLAND ECOSYSTEM			
Year	**Average Precipitation (centimeters)**	**Number of Trees**	**Number of Frogs**
0	92	55	155
2	82	70	135
4	56	95	100
6	64	80	115
8	61	80	110
10	92	54	160

The frog population of the wetland declined from Year 0 to Year 4 and increased in Year 6.

18. Which statement most likely explains the decline in the frog population?

A. The life cycle of frogs is dependent on rainfall.
B. The frogs moved to a wetland with fewer trees.
C. Habitat destruction reduced the number of frogs.
D. Competition with other species reduced the number of frogs.

BCR
Explain how environmental conditions affect the population cycles of wetland organisms. In your explanation, be sure to include

- the relationship between the amount of precipitation and the number of trees
- the relationship between the amount of precipitation and the number of frogs

A student response is below (label 1 is for bullet 1 and label 2 is for bullet 2):

label=1
value=The rain is good for the trees because the trees need water to grow and be healthy. The number of trees is going down when there is alot of rain. Rain is good for the trees just not to much. The roots of the trees would probley drown.

label=2
value=The rain is really good for the frogs the frog population is going up when there is jmore rain like the rain was at 56cm there was only 100 frogs and when the rain is at 92cm the frogs were at 155 and160. The frogs rpobley reproduce in rainy areas that is why the population gets so high in the rainn

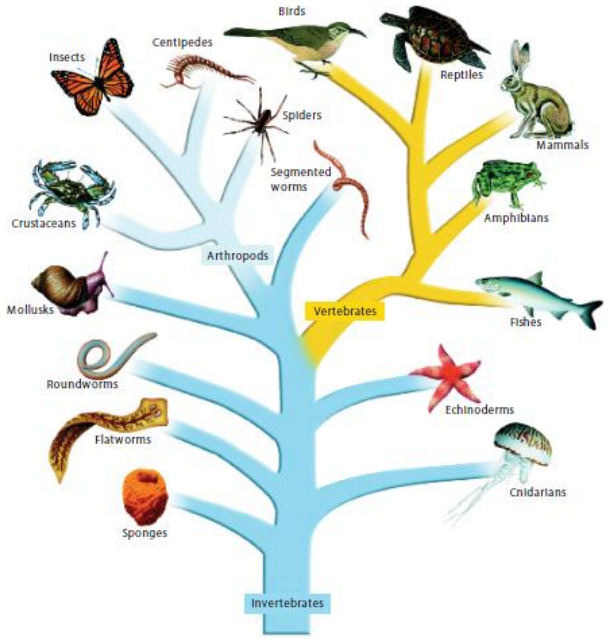
Fill in the chart:

Kingdom	Monera	Protista	Fungi	Plantae	Animalia
Cell Type (single or multi)	**Single-celled, no nucleus**	**Some are single-celled, others are multi-celled; cells have a nucleus**	**Most are multi-celled**	**Most are multi-celled**	**Multi-cellular**
Auto or heterotroph	**Some can make their own food, (autotroph) others cannot (heterotroph)**	**Heterotroph**	**Heterotroph**	**Autotroph**	**Heterotroph**
Energy Role	**Producer/ Decomposer**	**Consumer**	**Decomposer**	**Producer**	**Consumer**
Example	**Bacteria**	**Amoeba**	**Mushroom Yeast**	**Trees Flower**	**Lions Human**

19. Which kingdom contains organisms that are the most complex (having to do with their structure)?

Animalia

Use the classification tree to answer the following questions:



20. When the branches on the tree are closer together, those organisms share more **characteristics/similarities** with one another.

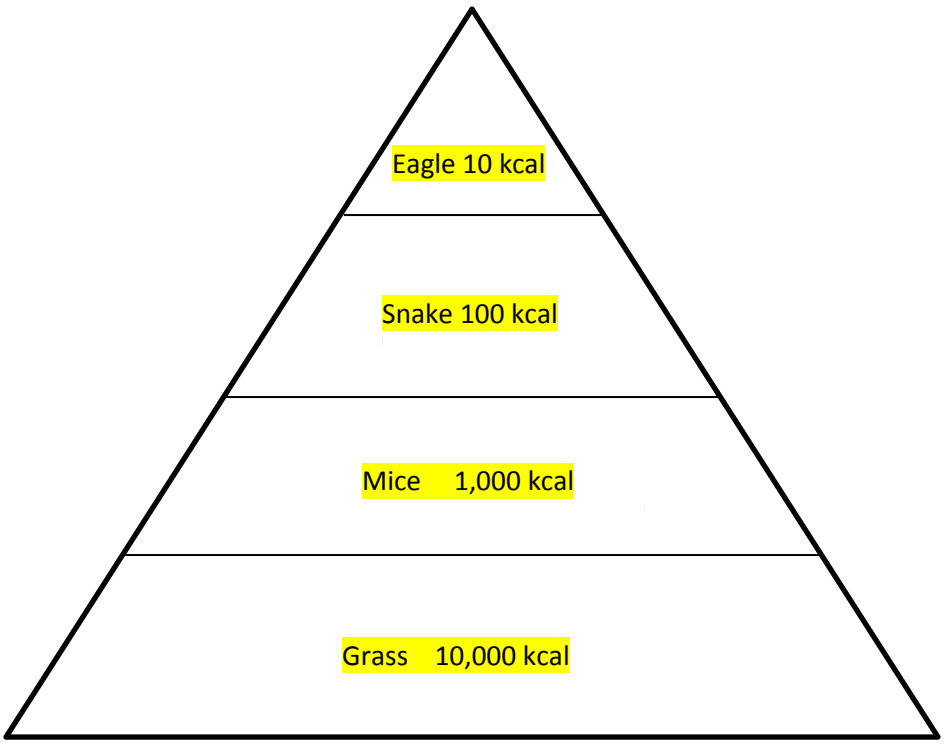
21. Based on their position on the tree, Cnidarians are most closely related to which group of organisms?
    a. Fish
    b. Flatworms
    c. Echinoderms
    d. Crustaceans

Energy Flow Through Ecosystems

Fill in the amount of energy available for the following organisms.

Organism Name	Energy Available (kilocalories)
Grass	10,000
Mice	1,000
Snake	**100**
Eagle	**10**

Draw the chart in a food pyramid.



Chesapeake Bay Ecosystem

Organism Name	Description	Food Source
Phytoplankton	Small microscopic water (salt) plant that is the base of most food webs.	Basis of food chain, needs sunlight and water to make food to fuel the web.
Rockfish	Larger fish; human destruction of habitat has caused a reduced number.	Small crustaceans, and little fish.
Small Fish	Little fish; reduced number leads to a reduce in predators.	Algae, Seaweed and Phytoplankton
Algae	Microscopic plant that produces its own food; basis of food chain/web.	Sun, carbon dioxide and water
Crabs	Crustacean, organism with a hard shell, Maryland native.	Phytoplankton, zooplankton, seaweed, small fish.
Seaweed	Bottom of sea/bay/ocean; behaves like a plant.	Filters organism for algae and draw organisms.
Sting Ray	Gray flat body. Consistent behavior	Lives on bottom of ocean, eats crustaceans and food.
Shark	Big, aggressive, sharp teeth. Long steamed lined body.	Top of food chain/web, only a few because there isn't enough energy to support all life.
Oyster	Two shelled organism, bivalve	Filter water to get zooplankton, phytoplankton, algae. Filter feeder

22. Which organisms are:

Producers	Consumers	Decomposers
Phytoplankton **Algae** **Seaweed**	**Rockfish** **Sting Ray** **Crabs** **Oyster** **Shark** **Small Fish**	**None**

23. Which organisms are:

Herbivores	Omnivores	Carnivores
Small Fish	**Crabs** **Oyster**	**Rockfish** **Sting Ray** **Shark**

24. Which energy role has the most available energy? **Producers**

25. Which organisms have the smallest population? Why? **Organisms at the top of the food chain would have the small population size because there is the least amount of energy available to support them.**