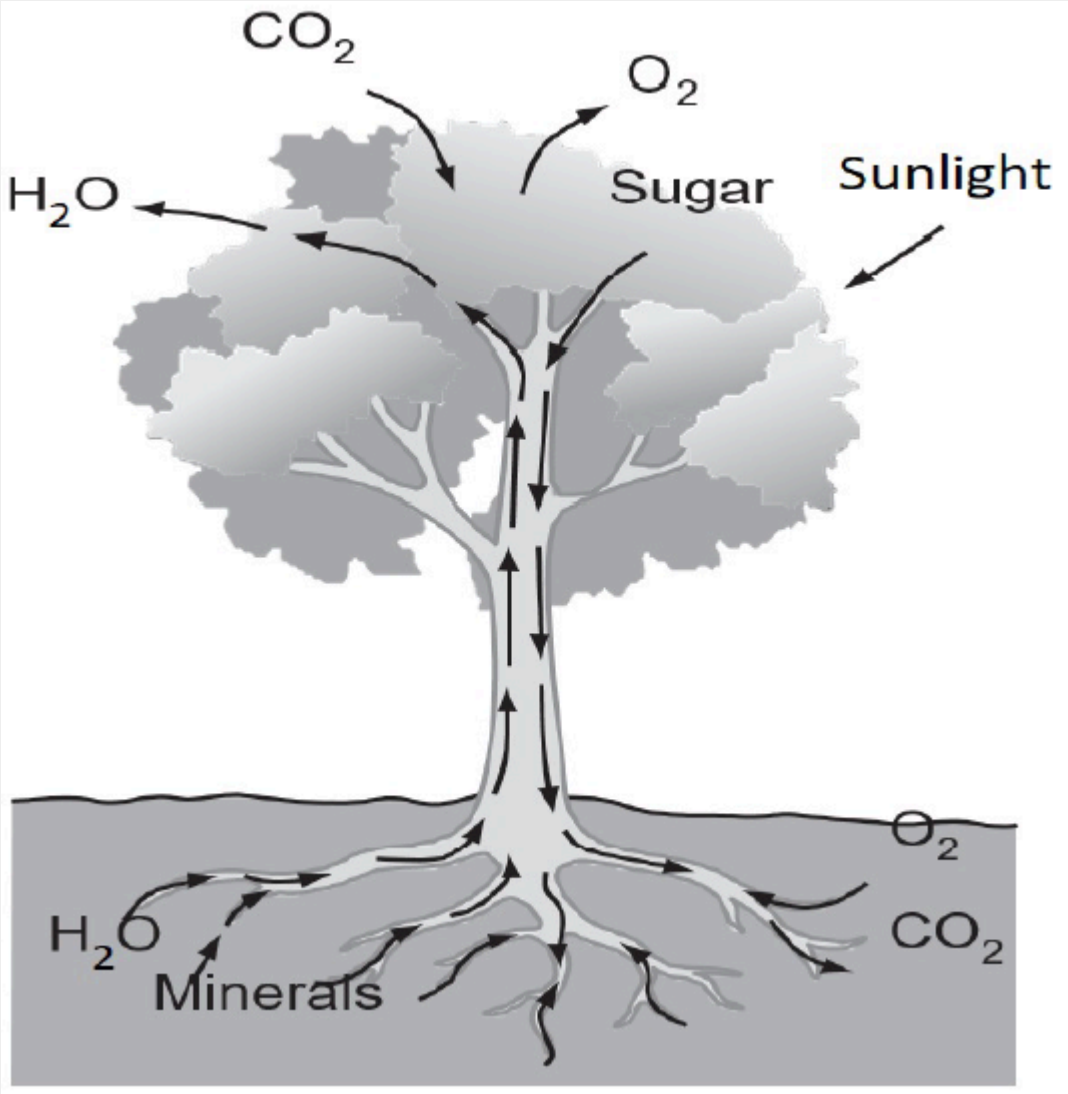
2023-2024 Gr6 Science Benchmark Unit 1

The diagram shows how matter moves in a tree.



Question 1.

Which statement describes one way that the source of the energy released during cellular respiration is delivered to tree cells?

A. Water is transported from the roots to the leaves.

B. Sugars are transported from the leaves to the roots.

C. Minerals are transported from the roots to the leaves.

D. Carbon dioxide is transported from the leaves to the roots.

Question 2.

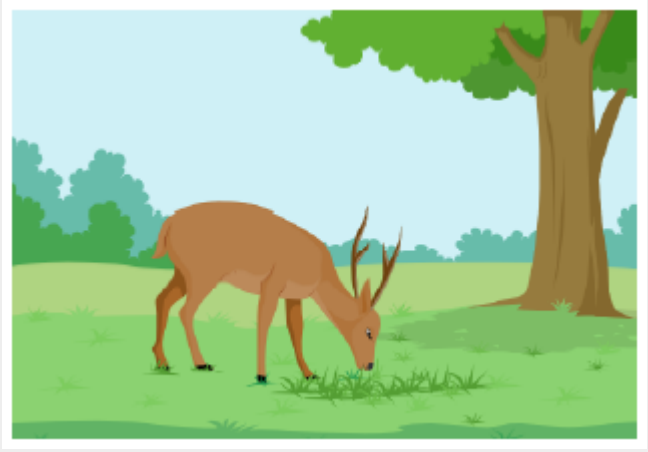
Photosynthesis is the process in which plants use energy from light to produce _____.

A. new cells

B. organelles

C. food

D. none of the above



Question 3.

Which should be included in an explanation of what happens to glucose stored in a plant if the plant is eaten by a deer? Select **all** that apply.

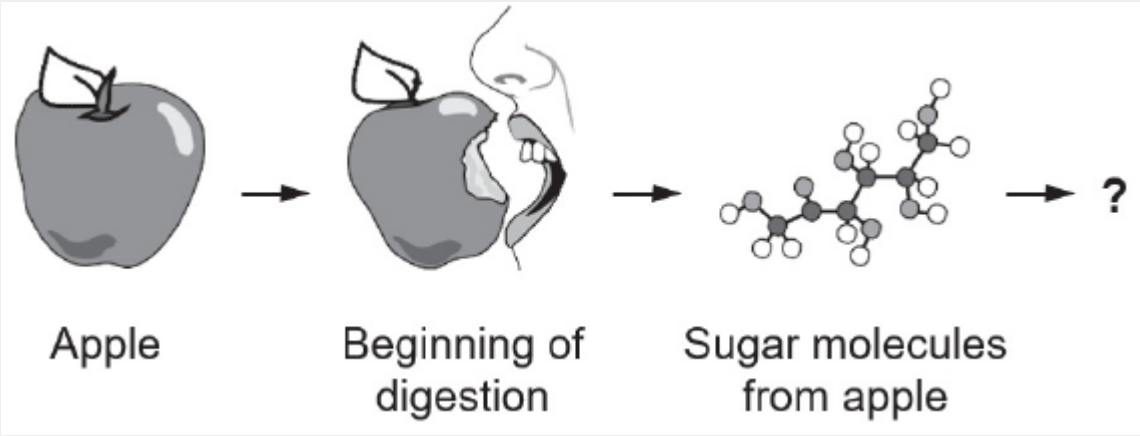
A. It is broken down in the deer's body and used for energy.

B. It is combined with other substances and used to repair cells or for growth.

C. It is unavailable to the deer and cycles out of its body.

D. It is turned into oxygen and muscle.

Ann is drawing a model of what happens when a person eats an apple.



Question 4.

Which statement best describes the next step in Ann's model?

A. Sugar molecules break down further to release energy inside of cells.

B. Sugar molecules combine chemically to absorb energy made by cells.

C. Sugar molecules break down further to release oxygen for use by cells.

D. Sugar molecules combine with other molecules to absorb waste material from cells.

Question 5.

Why are food webs better representations of how energy moves through an ecosystem than food chains?

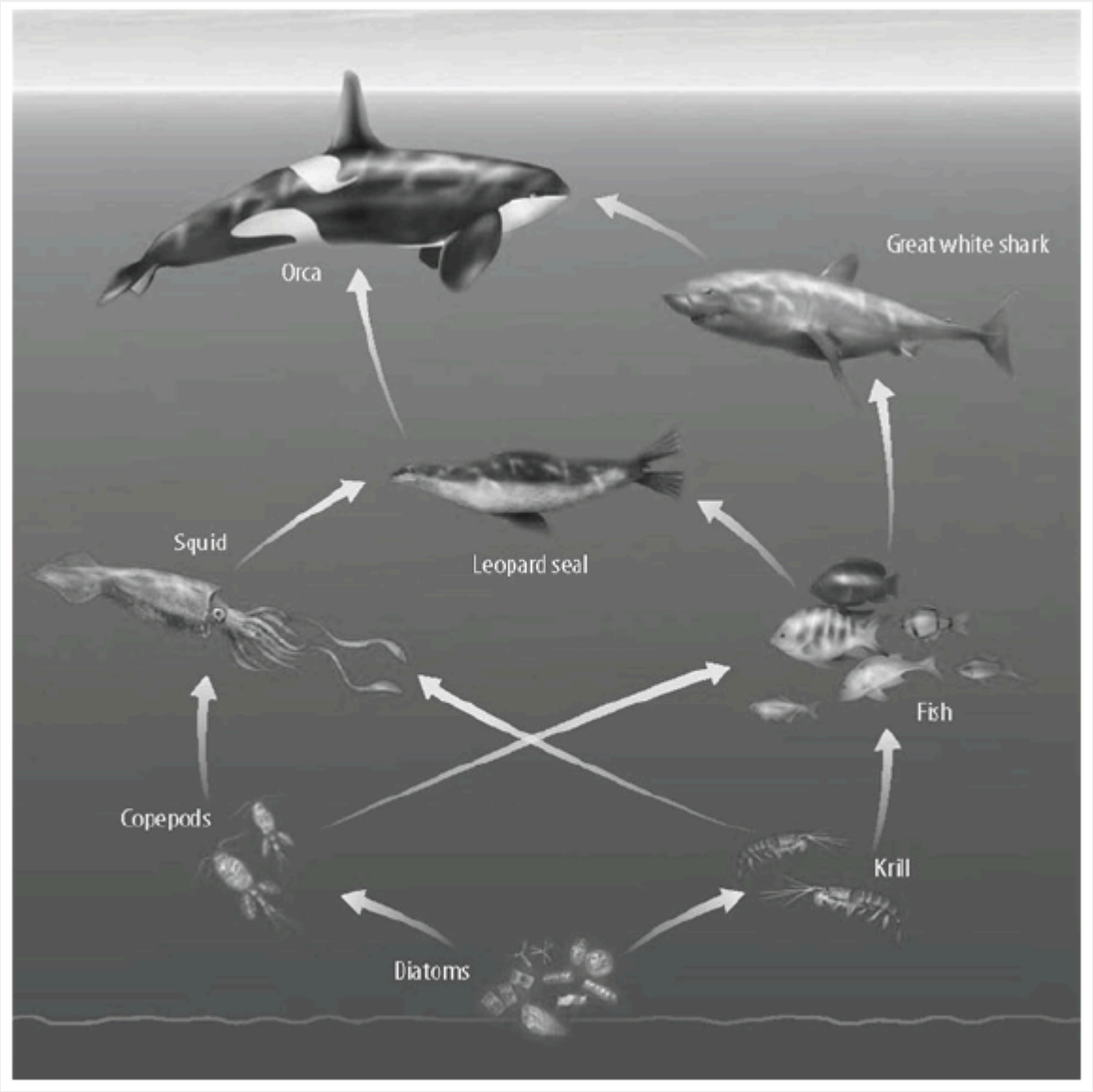
A. Food chains include decomposers, which do not play a role in energy movement through an ecosystem.

B. Food chains show how matter moves through an ecosystem, not not energy.

C. Food webs include how energy enters an ecosystem, and food chains don't.

D. Food webs show that animals in an ecosystem can get energy by eating different things.

Use the figure to answer the following questions.



Question 6.

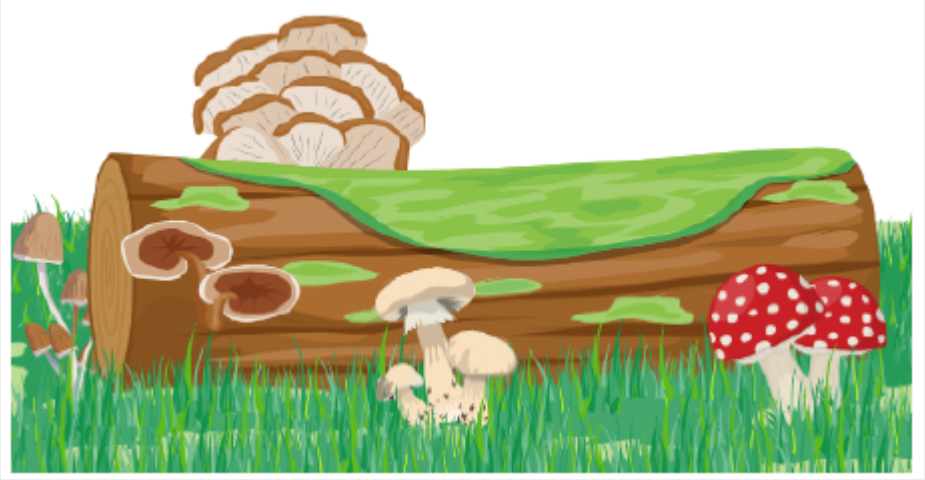
Which organism has the most energy available in the food web shown?

A. diatoms

B. squid

C. leopard seal

D. orca



Question 7.

Which describes the role of decomposers, such as the fungi shown, in an ecosystem?

A. obtain energy by eating living plants

B. release energy to be reused

C. recycle nutrients from dead plant or animal matter

D. transform light energy to chemical energy

Question 8.

Which could be correctly included in a model of the nitrogen cycle? Select **all** that apply.

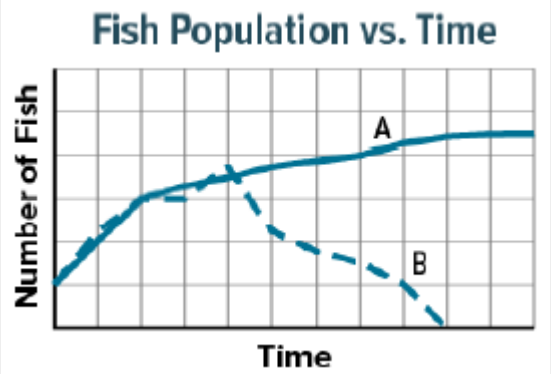
A. Bacteria on plant roots fix nitrogen.

B. Lightning fixes nitrogen gas from the atmosphere.

C. Organisms use nitrogen directly from the atmosphere.

D. Dead organisms decompose and release nitrogen.

Two types of fish are introduced to a small pond in the school courtyard. The pond contains some algae and water plants, but no other fish. Both the Fish A and Fish B populations do well at first, but after several weeks, the population of Fish B begins to drop until no individuals are left. Several students have hypothesized why this event occurred.



Question 9.

Which argument is best supported by the data?

A. Fish A and Fish B competed for the same food resources. Fish A outcompeted Fish B.

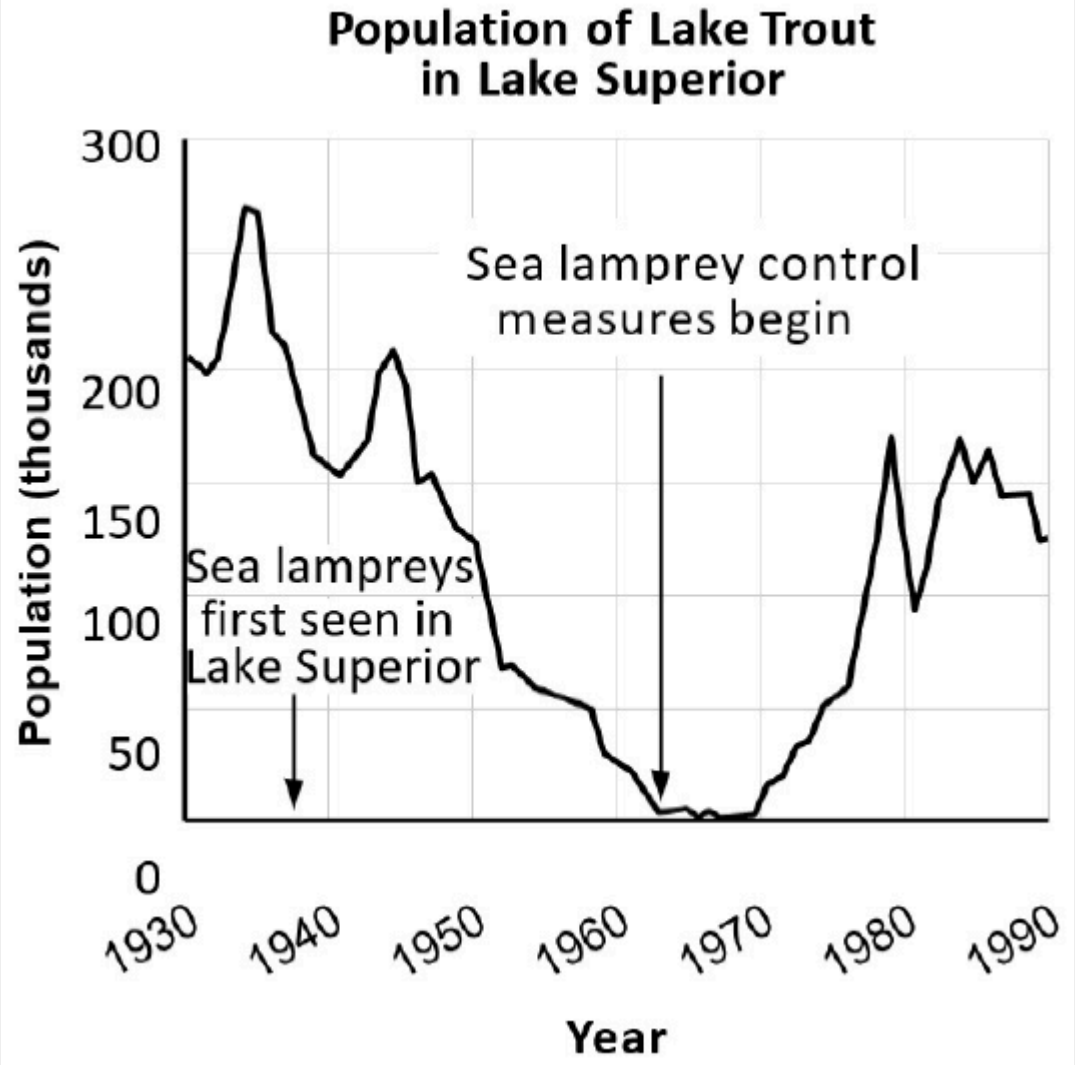
B. Fish A and Fish B had a mutually beneficial relationship where Fish A removed and ate parasites from Fish B.

C. Fish A was a predator of Fish B. Fish A hunted Fish B until none were left.

D. Fish B was a predator of Fish A. Fish A evolved a special toxin that made it toxic to Fish B.

The sea lamprey is a primitive fish that is a parasite on large fish species. Sea lampreys, which are native to the Atlantic Ocean, used a canal to spread to all of the Great Lakes beginning in the 1920s.

Sea lampreys prey on lake trout in the Great Lakes. The graph shows the impact of sea lampreys on lake trout in Lake Superior.



Question 10.

Based on the information in the text and graph, which statement best predicts what will happen in freshwater ecosystems where sea lampreys are introduced in the future?

A. Large fish species will adapt to the sea lampreys over time.

B. The sea lamprey population will not find any large fish populations to parasitize.

C. The sea lamprey population will cause extinction of large fish species within five years.

D. Large fish populations may be greatly reduced within 20 years of sea lamprey introduction.

Question 11.

What is the effect of the growth of a population in an ecosystem?

¿Cuál es el efecto del crecimiento de una población en un ecosistema?

A. fewer resources for each individual in the population

menos recursos para cada individuo en la población

B. a greater amount of resources in the ecosystem

una mayor cantidad de recursos en el ecosistema

C. a decrease in the amount of resources needed by each individual

una disminución en la cantidad de recursos que necesita cada individuo

D. an increase in the size of the ecosystem

un aumento en el tamaño del ecosistema

Question 12.

Drag and drop the relationship to the example.

mutualism | parasitism

heartworm in a dog — *DEST_1*

sea anemones help crabs fight off predators, and eat leftovers from the crabs' meals — *DEST_2*

Question 13.

In a predator–prey relationship, _____.

A. the predator hunts the prey for food

B. the prey hunts the predator for food

C. the prey keeps the predator population from growing too large

D. the prey are producers

Question 14.

One observation that scientists made was that the willow population increased as the elk were forced to forage in more varied areas to avoid wolves. This resulted in the beaver population increasing, as they had more resources to build dams to provide shelter through the winter. What other effect would you expect to see?

A. Beaver population will decrease, because more dams will reduce the number of willows.

B. Elk will increase in population, since the willow population has increased.

C. Migratory fish populations will decrease, because dams prevent them from returning upstream to mate.

D. Wolves will increase in population, because elk are not eating as many willows.

Question 15.

If an existing ecosystem is destroyed, _____.

A. primary succession occurs

B. secondary succession occurs

C. a climax community comes into existence

D. a different type of biome emerges

Question 16.

What is the difference between primary succession and secondary succession?

Question 17.

Scientists want to evaluate several possible solutions for maintaining biodiversity in ocean ecosystems. The solutions have all been in place for five years. Which of the following would be most useful for the scientists?

A. change in number of species per square kilometer over the five year period

B. average water temperature in each season over the five-year period

C. change in the average fish size from one year to the next

D. number of individual fish at the start and end of the study period

Question 18.

A group of students was asked to begin a project related to solutions for maintaining the biodiversity in an ecosystem. They decided to first research the topic of biodiversity and how it is measured to gather background information. Which of the following information about biodiversity is correct? Select **all** that apply.

A. Biodiversity describes the variety of species in an ecosystem.

B. Biodiversity of an ecosystem is related to the ecosystem's health.

C. Biodiversity is related to the resources and services an ecosystem produces.

D. Biodiversity is measured by counting the number of individual organisms and dividing by the size of the area.

E. Small changes in biodiversity can cause large changes in an ecosystem.

Question 19.

Gray wolves are also predators of and competitors with coyotes in Yellowstone, although the wolves generally prefer larger prey. After gray wolves were introduced, the coyote population initially dramatically decreased. Reduction of the coyote population impacted the populations of many other species in Yellowstone.

Coyotes are predators of foxes. Predict how the fox population would have changed after gray wolves were reintroduced at Yellowstone. Explain your reasoning.