

2023–2024 Gr5 Science Benchmark Unit 2

Question 1.

A scientist grew several plants in separate pots. They changed the amount of soil in each pot. The amount of light, water, and air was the same. They recorded the height of each plant.

They made the argument that plants get their materials for growth from the air and water.

1	25	14
2	35	31
3	45	9
4	55	15

What evidence supports this claim?

- A. The height of each plant was very different.
- B. The plant with the largest amount of soil grew the tallest.
- C. The plant that grew the tallest had less soil than two other pots.
- D. The pot with the least amount of soil was the shortest plant.

Question 2.

Plants need energy to acquire the nutrients they need to survive. The different parts of a plant's structure work together to keep the plant healthy. Which two functions do the leaves of a plant serve in obtaining the nutrients needed for survival?

- A. Leaves take in sunlight and oxygen.
- B. Leaves take in water and give off oxygen.
- C. Leaves take in sunlight and carbon dioxide.
- D. Leaves take in water and give off carbon dioxide.

Question 3.

Decomposers are not shown in the ecosystem diagram and not listed in the table.

The steps are about how decomposers affect the flow of matter in the desert ecosystem, but they are not in the correct order

Put the steps in order (from top to bottom), to show how matter flows in a desert ecosystem.

Plants take up nutrients from the soil.

Decomposers release nutrients into the soil.

Decomposers break down the hawk into nutrients.

The hawk dies.

Question 4.

The student decides to grow cacti at home to see how different types of environments affect its growth.

Where would the cactus die from a lack of nutrients? Select the **three** that apply.

- A. in a dark room
- B. in completely dry soil
- C. inside a sealed box
- D. on a windowsill
- E. on the ground outside

Question 5.

Plant growers using the hydroponic growing method claim that their plants receive the nutrients and materials they need in order to grow.

What is needed for plants to grow?

- A. sunlight, water, and soil
- B. sunlight, air, and water
- C. soil, air, and sunlight
- D. soil, water, and air

Question 6.

What is the relationship between the plants and animals in an ecosystem?
Select the **two** that apply.

- A. Animals get their energy from eating plants or other animals.
- B. All of the animals are able to get their energy directly from the plants.
- C. The Sun provides energy for all of the animals and plants in the ecosystem.
- D. Energy is gained when animals eat plants but lost when they eat other animals.

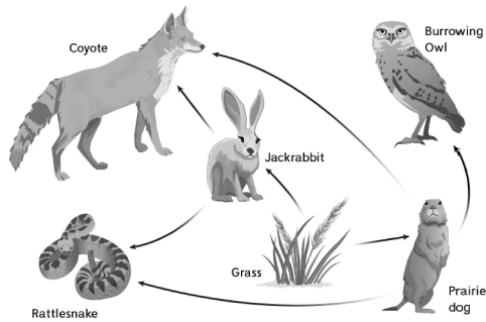
Question 7.

What impact do decomposers have on the movement of matter through the ecosystem?

- A. They make their own food by using energy from the Sun.
- B. They recycle nutrients into the soil so that other organisms can use them to grow.
- C. They eat other animals in order to get the energy they need to survive.
- D. They survive by eating only the plant matter that uses the Sun to make energy.

Question 8.

A student draws a food web of organisms that live on the prairie, as shown.

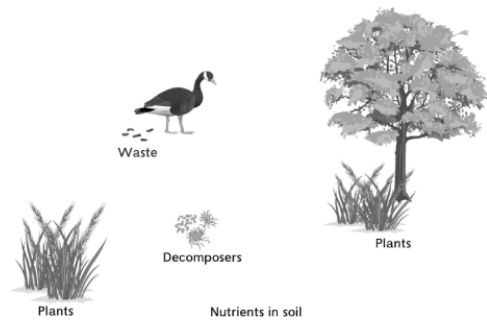


Which statement best describes how to add decomposers into this food web?

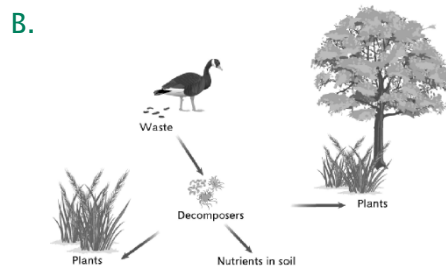
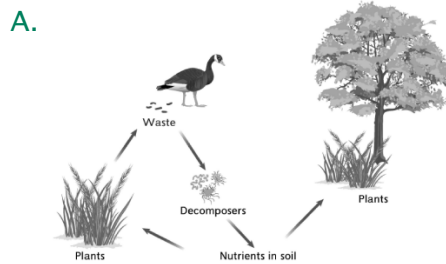
- A. Draw an arrow from the decomposers to the jackrabbit, because decomposers provide energy to the rabbit.
- B. Draw an arrow from the jackrabbit to the decomposers, because decomposers provide energy to the jackrabbit.
- C. Draw an arrow from the decomposers to the coyote, because decomposers are a food source for the coyote.
- D. Draw an arrow from the coyote to the decomposers, because decomposers use the coyote as a food source after it dies.

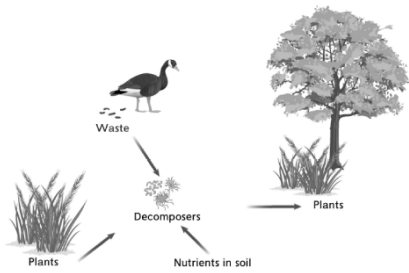
Question 9.

A class is working with a park ranger to complete a diagram for visitors of a local park. The diagram will model how the waste left by geese helps the park ecosystem.

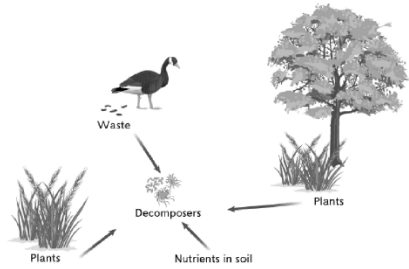


- A. Choose the answer that shows a complete diagram with arrows showing how the waste from the goose is used by living things in a park ecosystem.





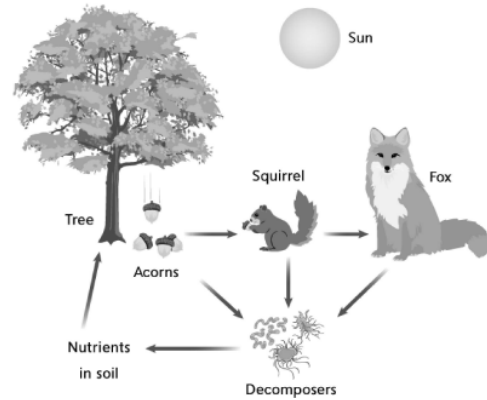
D.



B. Explain how the diagram shows that waste left by the goose will help the park ecosystem.

Question 10.

A student drew a model to show how matter moves in an ecosystem, as shown.

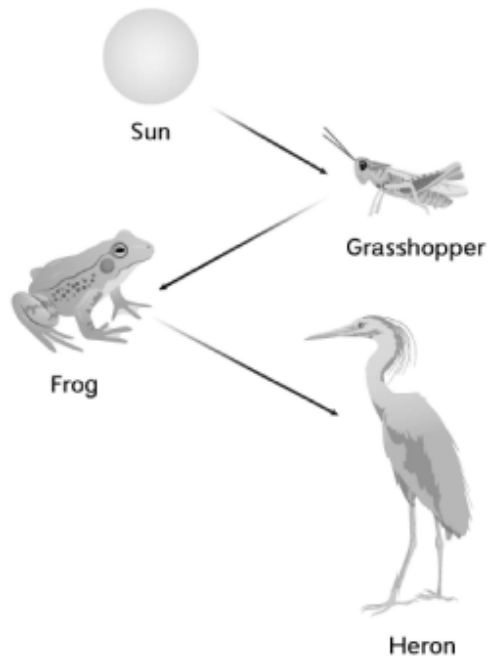


Which statement is supported by the student's model?

- A. Organisms get gases and water from the ecosystem.
- B. Matter transfers among organisms and the ecosystem.
- C. Organisms release heat energy back into the ecosystem.
- D. Both energy and matter are recycled in an ecosystem.

Question 11.

A student notices that an organism important for energy flow is missing from this model.



Which organism best completes the model and why?

- A. snake, because it can eat frogs for energy
- B. eagle, because it can eat herons for energy
- C. grass, because it captures energy from sunlight
- D. fish, because it can be eaten by herons for energy

Question 12.

Which statement best describes how animals use the energy they obtain after eating another organism?

- A. They use the energy to make food.
- B. They use the energy to grow and repair.
- C. They use the energy to take in carbon dioxide.
- D. They use the energy to absorb more sunlight and to grow.

Question 13.

A student designed this model of a deer eating grass.



What is the role of the Sun in the model?

- A. The deer gives energy to the grass so that the grass can make its own food from the Sun.
- B. The Sun powers the deer so that the deer can have the energy it needs to feed on the grass.
- C. The grass gets its energy from the Sun, and the energy gets transferred to the deer when the deer eats the grass.
- D. The Sun transfers energy to the grass, which gets lost when the deer eats the grass for its own energy.

Question 14.

This food chain models interactions that occur in a tropical grassland ecosystem.



Describe the Sun's role in the food chain.

Question 15.

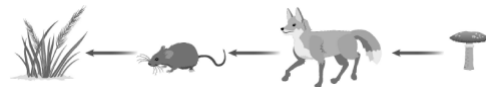
A person eats some vegetables that were grown using the hydroponic growing method. The vegetables provide the person with energy.

Which of the following **best** identifies the original source of energy for the vegetables?

- A. the air supplied through the pump that the vegetables received
- B. the water and nutrients that the vegetables grew in
- C. the plant material that the vegetables grew in
- D. the sunlight that the vegetables received

Question 16.

A student is learning about ecosystems and needs to construct a food chain using what she learned in science class. The food chain must have a producer, two consumers, and a decomposer. Her food chain is shown.



The student's teacher tells the student that her model is incorrect.

Describe the changes that the student should make to her model. Explain your reasoning.

Question 17.

The map shows the location of different types of climates around the world. Tropical and subtropical climates can be found at similar points on the map. Which statement explains the most likely reason why these are found at similar climate zones on the map?



- A. They have similar populations and animals. Their biospheres are mostly the same, and their food webs work closely together.
- B. They are all found close to the Equator. Geospheres and hydrospheres found close to the Equator interact to create a moist atmosphere.
- C. They are bordered by grasslands. These similar geosphere patterns create the moist broadleaf forest climate.
- D. They are all close to the ocean. The hydrosphere interacts with the

atmosphere and creates a moist environment.

Question 18.

Potatoes are usually grown in soil, but some potatoes are able to grow without soil. Potato plants were grown with three different methods as shown in Figure 1.

- Soil: planted in pots with soil
- Water: placed in pots with water and small stones added for support
- Air: suspended in the air on platforms with holes to let the roots hang down



Figure 1. Potato Plants Growing Methods

For all three methods shown in Table 1, the potatoes were given water with nutrients added.

Table 1. Data for Potatoes Grown by Different Methods

Growing Method	Average Number of Potatoes per Plant	Average Weight per Potato (grams)	Total Weight per Plant (grams)
Soil	6.5	29	188.5
Water	6.5	12	78
Air	28	12	336

A student claims that potatoes can be successfully grown without soil. Based on Table 1, which statements **best** support this claim?

Select **two** of the five statements.

- A. The heaviest potatoes were grown in soil.
- B. The greatest number of

potatoes were grown in air.

- C. Both water and air produced the same average weight per potato.
- D. Both soil and air produced plants with a greater total weight than water.
- E. Both soil and water produced the same average number of potatoes per plant.

Question 19.

When sugar dissolves in water, the sugar seems to disappear but the liquid tastes sweet. Why is the sugar **NOT** visible in the water?

- A. Sugar reacts with the water to make a new substance.
- B. The sugar crystals are hidden by the water that surrounds them.
- C. The sugar separates into a solution with many particles that are too small to see.
- D. Sugar changes to a colorless crystal when it becomes wet.

Question 20.

Kacey used a pump attached to a bicycle tire to inflate the tire. Before she used the pump, the tire was flexible. Afterward, it was not flexible and held its shape. Why did the tire hold its shape after it was inflated?

- A. Air particles pushed against the inside of the tire.
- B. Air from the pump changed the tire into a harder type of rubber.
- C. Air changed into a solid substance inside the tire and made it hold its shape.
- D. Air particles in the tire got bigger and filled the space in the tire.