

2026 MCAS Sample Student Work and Scoring Guide

High School Biology

Question 20: Constructed-Response

Reporting Category: Ecology

Practice Category: Evidence, Reasoning, and Modeling

Standard: [HS.LS.2.7](#) - Analyze direct and indirect effects of human activities on biodiversity and ecosystem health, specifically habitat fragmentation, introduction of non-native or invasive species, overharvesting, pollution, and climate change. Evaluate and refine a solution for reducing the impacts of human activities on biodiversity and ecosystem health.

Item Description: Analyze a food web to explain how populations would change under different environmental conditions and when another population in the food web decreases, and explain why a population increased with increased rainfall.

This item can be found in the released item sets on the [MCAS Resource Center](#).

Scoring Guide

Select a score point in the table below to view the sample student response.

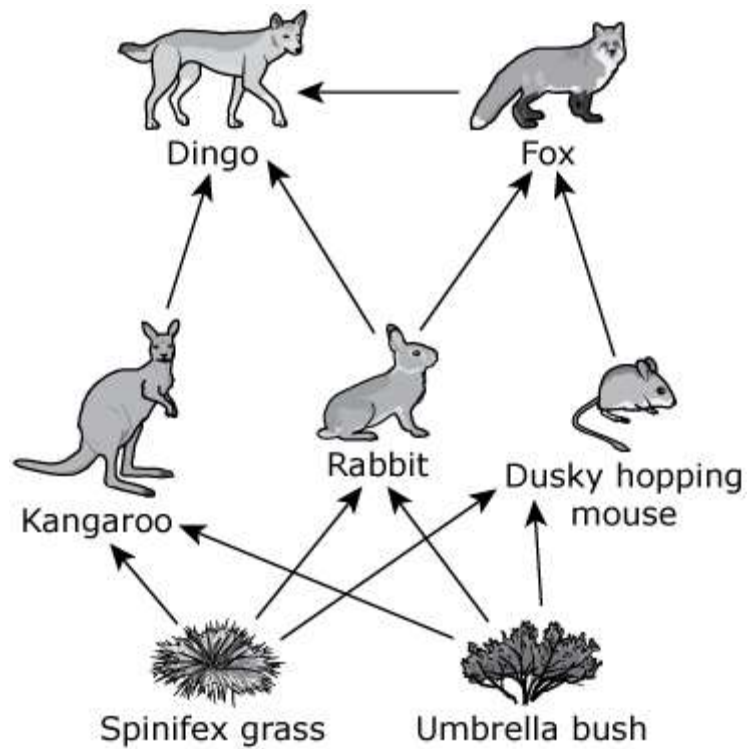
Score*	Description
4A 4B	The response demonstrates a thorough understanding of the effects of human activities on biodiversity and ecosystem health. The response correctly identifies the areas where more kangaroos and more dusky hopping mice would be expected to be found and clearly explains the reasoning. The response correctly identifies what would most likely happen to the dusky hopping mice population size if there was a large decrease in the number of rabbits and clearly explains the reasoning. The response also clearly explains why more mice were more likely to be found in areas of higher average rainfall.
3	The response demonstrates a general understanding of the effects of human activities on biodiversity and ecosystem health.
2	The response demonstrates a limited understanding of the effects of human activities on biodiversity and ecosystem health.
1	The response demonstrates a minimal understanding of the effects of human activities on biodiversity and ecosystem health.
0	The response is incorrect or contains some correct work that is irrelevant to the skill or concept being measured.

*Letters are used to distinguish between sample student responses that earned the same score (e.g., 4A and 4B).

Question Introduction

This question has four parts.

A food web for a grassland ecosystem is shown.



A fence was constructed to keep dingoes out of an area. The dingoes were not able to enter the fenced-in area. All of the other animals shown in the food web were able to move between the fenced-in area and the area outside the fence.

Score Point 4A**Part A**

Based on the food web, identify whether more kangaroos would be expected to be found in the fenced-in area or in the area outside the fence. Explain your reasoning.

There would be more kangaroos inside the fenced-in area because there are no dingos there, so they have no natural predators.

Part B

Based on the food web, identify whether more dusky hopping mice would be expected to be found in the fenced-in area or in the area outside the fence. Explain your reasoning.

There would be more dusky hopping mice outside the fenced in area because they are not directly preyed on by the dingos. However, the foxes are, so there will be less foxes outside the fenced in area, and foxes are the only predators of the mice, so the mice will have less predators outside the fenced in area.

Part C

Based on the food web, identify whether the dusky hopping mice population would increase, decrease, or stay the same if there was a large decrease in the number of rabbits. Explain your reasoning.

The dusky hopping mice population would decrease if there was a large decrease in the number of rabbits, because then there would be less prey for the foxes so they would start eating more mice.

Part D

Scientists studying the dusky hopping mice found that the mice were more likely to be found in areas with above-average rainfall.

Mice eat umbrella bushes, which can grow larger when there is more rain. This leads to there being more food for the mice so their population grows.

[Back to Scoring Guide](#)

Score Point 4B**Part A**

Based on the food web, identify whether more kangaroos would be expected to be found in the fenced-in area or in the area outside the fence. Explain your reasoning.

Based on the food web, the kangaroos would most likely be found in the fenced-in area. This is because the food web shows that the kangaroos are eaten by dingoes which is what the fence is used to keep out. This causing the kangaroos to be in the fenced-in area to survive instead of being eaten by the dingoes.

Part B

Based on the food web, identify whether more dusky hopping mice would be expected to be found in the fenced-in area or in the area outside the fence. Explain your reasoning.

The dusky hopping mice would most likely be found in the area outside of the fence based on the food web. This is because these mice are eaten by foxes but the foxes are eaten by dingoes. The foxes would most be on inside of the fence while the mice stayed on the outside of the fence to avoid being eaten as they aren't a food source for the dingoes.

Part C

Based on the food web, identify whether the dusky hopping mice population would increase, decrease, or stay the same if there was a large decrease in the number of rabbits. Explain your reasoning.

The dusky hopping mice would most likely increase if the rabbits population decreased. This is because the rabbits eat the same food that the mice do causing a competition between the two of food to eat. If the rabbits were to have a huge decrease in populations the mice would have more access to food to survive and reproduce.

Part D

Scientists studying the dusky hopping mice found that the mice were more likely to be found in areas with above-average rainfall.

Based off the food web, mice would most likely be found in areas of an above-average rainfall. This is because the mice eat off of plants such as an umbrella bush and spinifex grass which need rain and water to grow. Causing more rain for more plants to grow also causes more food for the dusky hopping mouse to eat.

[Back to Scoring Guide](#)

Score Point 3**Part A**

Based on the food web, identify whether more kangaroos would be expected to be found in the fenced-in area or in the area outside the fence. Explain your reasoning.

There would be more kangaroos inside the fenced in area. If the fenced in area is effective the dingos will stay out of it. This means that the kangaroos will have no chance of getting eaten by any dingos.

Part B

Based on the food web, identify whether more dusky hopping mice would be expected to be found in the fenced-in area or in the area outside the fence. Explain your reasoning.

There is a possibility that it could be the same amount that are found inside and outside of the fenced in area. The fox which is the predator of the mouse is able to roam in and out of the fenced in area. Therefore it could prey on the mouse in either area.

Part C

Based on the food web, identify whether the dusky hopping mice population would increase, decrease, or stay the same if there was a large decrease in the number of rabbits. Explain your reasoning.

The mouse population would decrease. Although the mouse does not prey on the rabbit the fox preys on both the rabbit and the mouse. If the fox still needed to keep the same amount of food intake with the rabbits gone then they would go after even more mice in order to sustain that.

Part D

Scientists studying the dusky hopping mice found that the mice were more likely to be found in areas with above-average rainfall.

The mouse feeds on the grass and the bush. When there is above average rainfall that must mean that the grass and the bush are more abundant, this means that there is more food for the mice. Therefore there is less competition in these area between the mice about their need to obtain food and nutrients.

[Back to Scoring Guide](#)

Score Point 2**Part A**

Based on the food web, identify whether more kangaroos would be expected to be found in the fenced-in area or in the area outside the fence. Explain your reasoning.

They would be expected to be found outside of a fenced area because they are wild animals

Part B

Based on the food web, identify whether more dusky hopping mice would be expected to be found in the fenced-in area or in the area outside the fence. Explain your reasoning.

They would be found outside the fence because they would be able to jump over or squeeze under one if put there

Part C

Based on the food web, identify whether the dusky hopping mice population would increase, decrease, or stay the same if there was a large decrease in the number of rabbits. Explain your reasoning.

The population would decrease because more of the mice would be eaten if there were less rabbit because they would be an easier source of food for the foxes

Part D

Scientists studying the dusky hopping mice found that the mice were more likely to be found in areas with above-average rainfall.

There would be more umbrella bushes for the mice to eat in areas with above average rainfall

[Back to Scoring Guide](#)

Score Point 1**Part A**

Based on the food web, identify whether more kangaroos would be expected to be found in the fenced-in area or in the area outside the fence. Explain your reasoning.

i think it would be able to be in both because it says the fence was only there for the dingoes and other animals could move between the fence.

Part B

Based on the food web, identify whether more dusky hopping mice would be expected to be found in the fenced-in area or in the area outside the fence. Explain your reasoning.

in the fence area because of how small the mouse is and how high it could possibly jump.

Part C

Based on the food web, identify whether the dusky hopping mice population would increase, decrease, or stay the same if there was a large decrease in the number of rabbits. Explain your reasoning.

it would increase becuae without the rabbit to eat the umbrella bush and the soinfex grass they will have more to eat.

Part D

Scientists studying the dusky hopping mice found that the mice were more likely to be found in areas with above-average rainfall.

becuase thats where the umbrella bush is and thats what the mouse eats.

[Back to Scoring Guide](#)

Score Point 0**Part A**

Based on the food web, identify whether more kangaroos would be expected to be found in the fenced-in area or in the area outside the fence. Explain your reasoning.

The Kangaroos will be found area outside the fence because they have their own food they eat.

Part B

Based on the food web, identify whether more dusky hopping mice would be expected to be found in the fenced-in area or in the area outside the fence. Explain your reasoning.

The Dusky hopping mouse will be found in fence because they will hide in the holes when they see danger approcting .

Part C

Based on the food web, identify whether the dusky hopping mice population would increase, decrease, or stay the same if there was a large decrease in the number of rabbits. Explain your reasoning.

It can stay the same because they somethings stay in their hole and wait of the is no animal there before the go searching for food.

Part D

Scientists studying the dusky hopping mice found that the mice were more likely to be found in areas with above-average rainfall.

Because there is a save place for them to stay where they will not mostly see their predators to eat them.

[Back to Scoring Guide](#)