

Patterns Across Places

Use evidence to predict ecosystem interactions.

MS-LS2-2 "Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems. Clarification Statement: Emphasis is on predicting consistent patterns of interactions in different ecosystems in terms of the..."

NAME _____

DATE _____

1 READ AND MARK _____ Read it twice

YOUR JOB Underline each abiotic condition or resource, circle each organism interaction, and number each change-and-effect pattern you notice.

Changing Resources, Changing Interactions

- ① At a woodland pond in spring, algae grow on sunlit rocks, while cattails rise from the muddy edge. Tadpoles scrape algae, and young snails graze nearby. A heron waits in shallow water and eats animals it can catch. After several cloudy weeks, students recorded fewer algae-covered rocks and saw tadpoles spending more time near cattail stems. Snails were also found in the same sheltered area. Water depth stayed about the same, so light, not drought, was the major change.
- ② In a dry grassland, grass seeds are eaten by mice and by seed-eating ants. A fox hunts mice, and a horned lizard eats ants. During a season with little rain, grass produced fewer seed heads. Researchers later counted fewer mice in open patches, while ants clustered beneath shrubs where some seeds had collected. Fox tracks became less common near those patches. The shrubs did not make seeds for the animals, but they changed shade, wind, and where seeds remained.
- ③ These places differ in rainfall, plants, and animal species, yet they show a useful pattern. Organisms need resources such as food, water, space, light, or shelter. When an abiotic condition changes a resource, organisms that use that resource may shift where they feed or live. Predators may then change their hunting areas because prey are less available in some places. Organisms can also benefit one another, as when insects pollinate flowers while collecting nectar. A prediction should name the changed condition, the resource affected, and linked organism interactions.

2 ANSWER WITH EVIDENCE Use the passage

- 1 If cloudy weather continues at the pond, predict the relationship between tadpoles and snails over algae. Use two pond observations to explain your prediction.

- 2 Construct a three-step explanation for why fox tracks might become less common in the grassland after little rain. Include rain, seeds, and mice.

- 3 What evidence from both ecosystems supports the prediction that organisms may shift locations when a resource becomes less available?

- 4 Why is the insect and flower relationship mutually beneficial? State what each organism gains.

3 YOUR TURN Your own words

Write 3 or 4 sentences about two ecosystems not described in the passage. For each ecosystem, name an abiotic change, the resource it affects, and a predicted organism interaction, then state the pattern shared by both ecosystems.

PART 1 • READ AND MARK

Underline each abiotic condition or resource, circle each organism interaction, and number each change-and-effect pattern you notice. Accept any marking that follows this job and points at the right text.

PART 2 • ANSWERS

#	QUESTION	ANSWER
1	If cloudy weather continues at the pond, predict the relationship between tadpoles and snails over algae. Use two pond observations to explain your prediction.	Tadpoles and snails will likely compete for algae because both eat or graze algae, and fewer algae-covered rocks were recorded.
2	Construct a three-step explanation for why fox tracks might become less common in the grassland after little rain. Include rain, seeds, and mice.	Little rain led to fewer grass seed heads. With fewer seeds, fewer mice were found in open patches. Foxes then had less mouse prey available there, so they hunted there less often.
3	What evidence from both ecosystems supports the prediction that organisms may shift locations when a resource becomes less available?	At the pond, tadpoles and snails were found near cattail stems after algae-covered rocks became fewer. In the grassland, ants clustered under shrubs where some seeds had collected.
4	Why is the insect and flower relationship mutually beneficial? State what each organism gains.	The insect gains nectar for food, and the flower gains pollination, which helps it reproduce.

PART 3 • YOUR TURN (SAMPLE ANSWER)

In a coral reef, unusually warm water can cause corals to lose algae that provide them with food, so fish that shelter among healthy corals may move to other reefs and compete for space. In an alpine meadow, a late frost can reduce flowers and nectar, so bumblebees may visit the remaining flowers more often, and both bees and flowers still benefit when pollination occurs. In both ecosystems, an abiotic change alters a resource and changes where organisms interact.

Accept predictions that correctly connect an abiotic change to a resource and then to an interaction, using evidence or accurate ecological reasoning. For the open task, accept competitive, predatory, or mutually beneficial interactions when each is scientifically plausible.