Willow Pond Changes

Trace how a dry summer affects life in a pond.

L.6.3 "Students will demonstrate an understanding of the relationships between survival, environmental changes, and diversity as they relate to the interactions of organisms, populations, and the environment..."

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Underline two nonliving factors and circle three living groups in the passage. Number the steps that show how less rain could lead to fewer minnows.

A Dry Summer at Willow Pond

1 At Willow Pond, green algae float near the sunny surface. Algae make food using sunlight, water, and nutrients. Tiny mayfly larvae graze on algae, minnows eat the larvae, and great blue herons catch minnows. Bacteria break down dead plants and animals, returning nutrients to the water. Nutrients can be used again, but energy moves through the food chain and is lost as heat along the way. Sunlight and water are nonliving, or abiotic, factors. Algae, larvae, minnows, herons, and bacteria are living, or biotic, factors.

2 One dry summer, little rain falls, and the pond shrinks. The same number of minnows crowd into less water. Minnows and young frogs both eat mayfly larvae, so they compete for this food. When fewer larvae are available, some minnows may not get enough to survive. Warm, shallow water also holds less dissolved oxygen than cooler water. Fish need that oxygen to breathe. Some minnows die, while others move to a connected stream. Herons may catch crowded fish easily at first, but fewer fish remain for them later.

3 A single minnow is an organism. All minnows of one kind belong to the same species; all members of that species in Willow Pond form a population. The algae, mayflies, minnows, frogs, herons, and bacteria are part of the pond community, which includes all its populations. The community together with water, sunlight, and other nonliving parts forms an ecosystem. This pond is one small part of the freshwater biome. If drought reduces the minnow population, it can change the food available to herons and the number of larvae that minnows eat.

2 ANSWER WITH EVIDENCE

Use the passage

1. How can less rain lead to fewer minnows? Trace the change from rain to water to fish.

2. Why do minnows and young frogs compete, and what could happen to minnows if their shared food becomes scarce?

3. Trace energy from sunlight to a heron through three other living groups. What do bacteria do when organisms die?

4. Name a population in Willow Pond. What does its community include that the population does not, and what does its ecosystem add?

3 YOUR TURN

Your own words

Choose a physical change at Willow Pond other than drought. In four sentences, name the nonliving factor that changes, predict a change in one population, and explain how that change could affect two other populations through feeding relationships.

ANSWER KEY

Willow Pond Changes

GRADE 6 · L.6.3

PART 1 · READ AND MARK

Underline two nonliving factors and circle three living groups in the passage. Number the steps that show how less rain could lead to fewer minnows. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	How can less rain lead to fewer minnows? Trace the change from rain to water to fish.	**Less rain shrinks the pond. Warm, shallow water holds less dissolved oxygen, which minnows need to breathe, so some may die.**
2	Why do minnows and young frogs compete, and what could happen to minnows if their shared food becomes scarce?	**Both eat mayfly larvae. If larvae become scarce, some minnows may not get enough food to survive.**
3	Trace energy from sunlight to a heron through three other living groups. What do bacteria do when organisms die?	**Sunlight supports algae, which feed mayfly larvae; minnows eat the larvae, and herons eat minnows. Bacteria break down dead organisms and return nutrients to the water.**
4	Name a population in Willow Pond. What does its community include that the population does not, and what does its ecosystem add?	**Minnows of one kind in Willow Pond form a population. The community includes other populations, such as algae and frogs. The ecosystem also includes nonliving parts, such as water and sunlight.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

A fallen tree shades part of Willow Pond, so less sunlight reaches the algae. With less light for making food, the algae population may shrink. With fewer algae to eat, the mayfly larva population may also shrink. As the larvae become scarce, minnows may have less food, and their population may decline.

Accept other plausible four-sentence predictions that identify a changed abiotic factor and trace feeding effects across three pond populations. Predictions should distinguish a possible effect from a certain outcome.