

Webs After Change

Trace how disruptions, succession, and biodiversity shape ecosystem recovery.

8.12 "Organisms and environments. The student understands stability and change in populations and ecosystems. The student is expected to: explain how disruptions such as population changes, natural disasters..."

NAME _____

DATE _____

1 READ AND MARK _____ Read it twice

YOUR JOB Circle each disruption, then underline the words that describe its effect on energy transfer, succession, or biodiversity.

A Coastline in Recovery

- ① Along a rocky Pacific coast, sea otters eat sea urchins, and urchins eat kelp. Kelp captures sunlight and makes food, so it begins a food web that can support fish, crabs, and seals. When a disease lowered the otter population, more urchins survived. The larger urchin population grazed heavily on kelp. With less kelp, less energy entered the web, and animals that used kelp for food or shelter declined. A change in one population therefore altered energy available to several others.
- ② A hurricane can knock down a coastal forest, while logging can remove trees from a hillside. If soil, seeds, and roots remain, recovery usually begins with secondary succession. Grasses and fast-growing plants appear first, followed by shrubs and young trees. Primary succession begins where bare rock or new land has no soil, such as ground exposed after a glacier retreats. Lichens and other pioneer organisms help form soil. Both kinds of succession change populations over time and can gradually increase species diversity.
- ③ A healthy forest contains many species with different feeding roles. Several pollinators may visit the same flowering plant, and several predators may limit one herbivore. This biodiversity can keep the ecosystem functioning when one species declines, because another species may partly perform a similar role. Diverse plant species also provide varied food and habitats, supporting healthier populations. However, biodiversity does not prevent every disturbance. It improves the chance that energy continues to move through the food web and that the ecosystem recovers and remains sustainable.

2 ANSWER WITH EVIDENCE _____ Use the passage

1 Explain the chain of changes that occurred after disease lowered the sea otter population.

2 Which type of succession would most likely follow a hurricane that knocks down a forest? Use evidence from the passage to explain.

3 Why would primary succession occur on ground exposed after a glacier retreats instead of secondary succession?

4 How can biodiversity help an ecosystem continue functioning when one species declines?

3 YOUR TURN _____ Your own words

Create a five-sentence explanation of a disruption in an ecosystem you choose. Include the disruption, one change in energy transfer, the type of succession that would occur and why, and two ways biodiversity could support recovery.

PART 1 • READ AND MARK

Circle each disruption, then underline the words that describe its effect on energy transfer, succession, or biodiversity. Accept any marking that follows this job and points at the right text.

PART 2 • ANSWERS

#	QUESTION	ANSWER
1	Explain the chain of changes that occurred after disease lowered the sea otter population.	Fewer otters allowed more sea urchins to survive. More urchins ate more kelp, so less energy entered the food web and kelp-dependent animals declined.
2	Which type of succession would most likely follow a hurricane that knocks down a forest? Use evidence from the passage to explain.	Secondary succession, because soil, seeds, and roots can remain after the hurricane.
3	Why would primary succession occur on ground exposed after a glacier retreats instead of secondary succession?	Primary succession occurs because the newly exposed ground has no soil. Pioneer organisms such as lichens help form soil.
4	How can biodiversity help an ecosystem continue functioning when one species declines?	Other species may partly perform a similar feeding role. Diverse plants also provide varied food and habitats, helping energy continue to move through the food web.

PART 3 • YOUR TURN (SAMPLE ANSWER)

After a wildfire in an oak woodland, soil and roots remain, so secondary succession begins. Grasses grow first and capture sunlight, providing energy for insects and rabbits. Shrubs and young oaks return later, adding food and shelter. If one insect species falls, birds can still eat other insects, and different plants can feed different herbivores. This variety helps the woodland recover and keeps organisms healthier.

Accept equivalent cause-and-effect explanations that accurately connect a disruption to energy transfer, succession, and biodiversity. For the open response, accept any ecosystem and disruption if the stated succession type matches whether soil remains and the biodiversity claims are scientifically reasonable.