

Tide Pool Connections

Trace how resources, roles, and relationships link a biological community.

LS.6 "The student will investigate and understand that populations in a biological community interact and are interdependent. Key ideas include relationships exist between predators and prey and these relationships are modeled in food webs..."

NAME _____

DATE _____

1 READ AND MARK _____ Read it twice

YOUR JOB Underline each resource. Circle each relationship between populations and label it P, S, or C for predator-prey, symbiosis, or competition/cooperation, then box each statement that tells an organism's niche.

Life Between the Tides

- ① On a rocky shore, a tide pool becomes a crowded community when the tide goes out. Algae use sunlight to make food. Periwinkle snails scrape algae from rocks, and sea stars eat some snails. This predator-prey link is one path in a food web, a model that shows many feeding connections. Small fish may also eat algae or tiny animals. Because several organisms use the same algae, a drop in algae can affect snails, fish, and the sea stars that depend on snails.
- ② At high tide, cleaner shrimp pick parasites and dead tissue from a moray eel's skin. The shrimp gain a meal, while the eel is cleaned. This mutualistic symbiosis supports both species. In another relationship, a barnacle attaches to a whale's skin. The barnacle gains transportation through food-rich water, while the whale is usually neither helped nor harmed. These relationships are not feeding links, but they still show how species can affect one another's survival in the same community.
- ③ Each population has a niche, or a particular role in its community. A hermit crab's niche includes eating scraps, using empty shells for shelter, and serving as prey for octopuses. Crabs may compete when too few empty shells are available. However, some shore animals cooperate indirectly with other species. Mussels grow in clusters that create damp hiding places for young crabs and fish. If a change removes one population or resource, other populations may need to compete more, find another resource, or decline.

2 ANSWER WITH EVIDENCE _____ Use the passage

1 How could a drop in algae affect sea stars? Use the food web path from the passage in your answer.

2 What does each species gain in the cleaner shrimp and moray eel relationship?

3 How is the barnacle-whale relationship different from the cleaner shrimp-eel relationship?

4 Name two parts of a hermit crab's niche. Then state what resource shortage can cause crabs to compete.

3 YOUR TURN _____ Your own words

Create a five-organism community in the table. Give each organism a niche, include at least one predator-prey relationship, one symbiotic relationship, and one competition relationship, then predict an effect if one resource becomes scarce.

ORGANISM	NICHE AND RESOURCE	RELATIONSHIPS	EFFECT IF ONE RESOURCE BECOMES SCARCE

PART 1 • READ AND MARK

Underline each resource. Circle each relationship between populations and label it P, S, or C for predator-prey, symbiosis, or competition/cooperation, then box each statement that tells an organism's niche. Accept any marking that follows this job and points at the right text.

PART 2 • ANSWERS

#	QUESTION	ANSWER
1	How could a drop in algae affect sea stars? Use the food web path from the passage in your answer.	Fewer algae could affect snails, and sea stars could then have less snail prey.
2	What does each species gain in the cleaner shrimp and moray eel relationship?	The shrimp gain a meal, and the eel is cleaned of parasites and dead tissue.
3	How is the barnacle-whale relationship different from the cleaner shrimp-eel relationship?	The barnacle benefits by gaining transportation, while the whale is usually not helped or harmed. In the shrimp-eel relationship, both species benefit.
4	Name two parts of a hermit crab's niche. Then state what resource shortage can cause crabs to compete.	Its niche includes eating scraps, using empty shells for shelter, and serving as octopus prey. Too few empty shells can cause competition.

PART 3 • YOUR TURN (SAMPLE ANSWER)

ORGANISM	NICHE AND RESOURCE	RELATIONSHIPS	EFFECT IF ONE RESOURCE BECOMES SCARCE
Oak tree	Producer that uses sunlight and water	Mutualism with mycorrhizal fungus	If water becomes scarce, it makes fewer sugars and acorns.
Mycorrhizal fungus	Gets sugars from the oak	Mutualism with oak tree	It receives less sugar.
Mouse	Eats acorns and is owl prey	Competes with squirrel, prey for owl	It has less food and competes more.
Squirrel	Eats acorns and is owl prey	Competes with mouse, prey for owl	It has less food and competes more.
Owl	Hunts mice and squirrels	Predator of mouse and squirrel	It may have fewer prey to eat.

Accept equivalent cause-and-effect explanations that follow the passage. For the open task, accept any accurate community in which the listed relationships and resource-change effect are logically connected.