

Survival by Design

Trace how ecosystem factors connect to adaptations.

LS.7 "The student will investigate and understand that adaptations support an organism's survival in an ecosystem. Key ideas include biotic and abiotic factors define land, marine, and freshwater ecosystems..."

NAME _____

DATE _____

1 READ AND MARK _____ Read it twice

YOUR JOB Underline abiotic factors, circle biotic factors, and number each physical or behavioral adaptation you find. Use your marks to see how organisms survive where they live.

Living Where Conditions Change

- ① Ecosystems are shaped by living and nonliving parts. Biotic factors are organisms, such as plants, animals, fungi, and bacteria. Abiotic factors include sunlight, temperature, water, soil, salt, and moving air. On land, rainfall and soil help determine which plants can grow. In freshwater ponds and streams, the amount of dissolved oxygen and the speed of water matter. In marine ecosystems, salt water, waves, depth, and light affect where organisms can live and reproduce successfully.
- ② In a freshwater stream, a beaver faces cold water, currents, and seasonal changes in food. Its dense, oily fur traps air and reduces heat loss. Webbed hind feet help it swim, and its broad, flat tail helps steer. The beaver also changes its behavior. It gathers branches, builds a lodge, and stores food for winter. These actions help it avoid predators, stay warm, and find food when plants are scarce during winter months.
- ③ On a rocky marine shore, mussels live where waves crash and tides uncover the rocks twice each day. Waves, salt, and exposure to air are abiotic factors. Sea stars that eat mussels and algae growing nearby are biotic factors. A mussel's hard shell protects its soft body. Strong threads anchor it to rock, so waves are less likely to wash it away. When the tide is low, it closes its shell to hold in moisture.

2 ANSWER WITH EVIDENCE _____ Use the passage

1 Name two abiotic factors that matter in freshwater ponds and streams.

2 Explain how the beaver's dense, oily fur and webbed hind feet help it survive in a stream.

3 Identify one biotic factor and one abiotic factor on the rocky marine shore. Tell why each belongs in that group.

4 What does a mussel do when the tide is low, and what survival problem does this behavior solve?

3 YOUR TURN _____ Your own words

Choose a land, freshwater, or marine ecosystem and an organism that lives there. Write exactly three sentences that name two abiotic factors and one biotic factor, describe one physical adaptation and one behavioral adaptation, and explain how the adaptations help the organism survive.

PART 1 • READ AND MARK

Underline abiotic factors, circle biotic factors, and number each physical or behavioral adaptation you find. Use your marks to see how organisms survive where they live. Accept any marking that follows this job and points at the right text.

PART 2 • ANSWERS

#	QUESTION	ANSWER
1	Name two abiotic factors that matter in freshwater ponds and streams.	The amount of dissolved oxygen and the speed of water.
2	Explain how the beaver's dense, oily fur and webbed hind feet help it survive in a stream.	Its fur traps air and reduces heat loss in cold water. Its webbed hind feet help it swim.
3	Identify one biotic factor and one abiotic factor on the rocky marine shore. Tell why each belongs in that group.	A sea star or algae is biotic because it is living. Waves, salt, or exposure to air is abiotic because it is nonliving.
4	What does a mussel do when the tide is low, and what survival problem does this behavior solve?	It closes its shell to hold in moisture, which helps prevent it from drying out when exposed to air.

PART 3 • YOUR TURN (SAMPLE ANSWER)

In a desert land ecosystem, hot temperatures and little rainfall are abiotic factors, and insects are a biotic factor. A desert lizard has scaly skin that reduces water loss. It stays in shade or burrows during the hottest part of the day, which helps it avoid overheating.

Accept equivalent factors and adaptations if they are accurate for the chosen organism and ecosystem. The response must distinguish living from nonliving factors and connect both adaptations to survival.