Estuary Survival Tools

Use adaptations to explain feeding roles in an estuary

MAQ.7.6 "Using key morphological and physiological adaptations found within aquatic vertebrate taxa, assess how animals interact with their environment to determine their ecological roles."

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Underline each body structure or body process that helps an animal survive or feed. Circle the food it eats, then number the three animals according to where they feed: 1 for open water, 2 for the sandy bottom, and 3 for a hunter moving through the water.

Three Ways to Feed in an Estuary

1. At the mouth of an estuary, a school of Atlantic menhaden moves through cloudy water. Each fish beats its forked tail to swim steadily with the group. As water passes over its gills, oxygen enters its blood. Water also passes through its mouth, where fine gill rakers trap tiny plankton. Menhaden eat these drifting organisms rather than chasing large prey. By feeding on plankton, they move energy from small drifting life into fish bodies. Their schools can then become a concentrated food source for larger hunters.

2. On the sandy bottom below, a southern stingray uses a different plan. Its wide pectoral fins ripple as it glides just above the sediment. Its flat body can settle into sand, making it harder for prey or predators to spot. The ray senses weak electrical signals from animals hidden below the surface. It can uncover a buried clam or worm with a burst of water and take prey into its mouth on the underside of its body. Instead of filtering drifting food, this bottom hunter removes animals from the sediment and can disturb the sand while feeding.

3. Above the school, a bottlenose dolphin searches for fish. Its streamlined body and powerful tail flukes help it swim quickly, while echolocation lets it locate prey by listening for returning sound echoes. A dolphin breathes air with lungs and must surface to inhale through its blowhole. Unlike the menhaden, it cannot take oxygen from water through gills. If dolphins drive a school together, they may capture individual fish, including menhaden. In this estuary, the filter feeder, the bottom hunter, and the fish hunter use different traits to reach food in different places.

2 ANSWER WITH EVIDENCE

Use the passage

1. How do a menhaden's gill rakers help it fill a different feeding role from a stingray?

2. Why is a stingray suited to hunting buried clams or worms? Use two traits from the passage.

3. How do the dolphin and menhaden get oxygen differently, and what must the dolphin do while hunting?

4. A dolphin catches a menhaden from a school. Explain how one adaptation of each animal helps shape this feeding interaction.

3 YOUR TURN

Your own words

Invent a plausible fish that lives in rocky tide pools. In four sentences, describe one body structure and one body process that help it survive or feed there, then explain its ecological role and one effect it has on another organism.

ANSWER KEY

Estuary Survival Tools

HIGH SCHOOL · MAQ.7.6

PART 1 · READ AND MARK

Underline each body structure or body process that helps an animal survive or feed. Circle the food it eats, then number the three animals according to where they feed: 1 for open water, 2 for the sandy bottom, and 3 for a hunter moving through the water. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	How do a menhaden's gill rakers help it fill a different feeding role from a stingray?	**Gill rakers trap drifting plankton, making the menhaden a filter feeder. The stingray hunts animals in the sediment.**
2	Why is a stingray suited to hunting buried clams or worms? Use two traits from the passage.	**It senses weak electrical signals from hidden animals and can uncover them with a burst of water. Its underside mouth lets it take prey from the bottom.**
3	How do the dolphin and menhaden get oxygen differently, and what must the dolphin do while hunting?	**Menhaden take oxygen from water through gills. Dolphins breathe air with lungs, so they must surface to inhale while hunting.**
4	A dolphin catches a menhaden from a school. Explain how one adaptation of each animal helps shape this feeding interaction.	**The menhaden's gill rakers let it feed on plankton, moving that energy into its body. The dolphin's echolocation helps it find fish such as menhaden.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

My tide-pool fish has blunt teeth that crush small snails on rocks. When oxygen drops in a warm, shallow pool, it slows its metabolism and uses less oxygen. This fish is a snail predator. By eating snails, it can reduce their grazing on algae.

Accept other passage-supported links between adaptations, feeding locations, and ecological roles. For the open task, accept plausible invented fish with a distinct structure, body process, role, and effect on another organism.