Shifting Shore Shapes

Model how moving water changes a connected coast.

E.4.9C.2 "Develop and use models of natural processes to explain the effect of the movement of water on the ocean shore zone, including beaches, barrier islands, estuaries, and inlets (e.g., marshes, bays, lagoons, fjords, or sound)."

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Underline four descriptions of moving water, then circle a change each movement causes along the shore. Give each matching cause-and-change pair the same number.

Maya Models the Coast

1. On a windy day, Maya watches waves wash up a sandy beach. Each wave pushes sand toward land, and water running back pulls some sand toward the sea. Waves arriving at an angle also move sand down the shore. Maya draws arrows for these paths. Her model shows why a beach can lose sand in one spot and gain it in another.

2. Farther out, a long, narrow barrier island lies between the open ocean and a quiet bay. Waves and currents shift sand along its ocean side, changing its shape over time. During a strong storm, rushing water may cut a new channel through the island. That channel is an inlet. Ocean water can then flow through the inlet into the bay.

3. At the bay's edge, a river meets salty ocean water. This mixing place is an estuary. As tides rise, ocean water moves through the inlet and farther into the estuary. As tides fall, water flows back toward the ocean. In slower parts of the estuary, mud carried by water settles and builds marsh ground. Maya adds arrows and dots to show both moving water and settling mud.

2 ANSWER WITH EVIDENCE

Use the passage

1. How would you use arrows to show waves moving sand along the beach, and what change could that movement cause?

2. How could your model show why the barrier island changes shape over time?

3. A storm cuts a channel through the barrier island. What should you label the channel, and where could water travel through it?

4. Which way should arrows point in the estuary as tides rise? Which way should they point as tides fall?

3 YOUR TURN

Your own words

Draw two panels showing the barrier island, bay, and estuary before and after a storm cuts an inlet. In the second panel, add arrows for rising and falling tides and dots where mud might settle, then write two sentences explaining a shore change your model shows.

ANSWER KEY

Shifting Shore Shapes

GRADE 4 · E.4.9C.2

PART 1 · READ AND MARK

Underline four descriptions of moving water, then circle a change each movement causes along the shore. Give each matching cause-and-change pair the same number. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	How would you use arrows to show waves moving sand along the beach, and what change could that movement cause?	**Arrows can show angled waves moving sand down the shore. One part of the beach may lose sand while another gains it.**
2	How could your model show why the barrier island changes shape over time?	**Show waves and currents shifting sand along the island's ocean side, changing its shape.**
3	A storm cuts a channel through the barrier island. What should you label the channel, and where could water travel through it?	**Label it an inlet. Ocean water could flow through it into the bay.**
4	Which way should arrows point in the estuary as tides rise? Which way should they point as tides fall?	**At rising tide, arrows point farther into the estuary. At falling tide, they point back toward the ocean.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

The first panel shows a barrier island between the ocean and bay, with a river meeting the bay at an estuary. The second shows an inlet through the island, arrows into the estuary for rising tide, arrows toward the ocean for falling tide, and mud dots in a slow part of the estuary. Storm water cut the inlet, letting ocean water flow into the bay. Mud may settle in the slower water and build marsh ground.

Accept any clear model that shows an inlet cut through the barrier island, opposite tide directions, and possible mud buildup in a slow part of the estuary. The written explanation should connect moving water to a shore change.