Lights on the Beach

Assess a coastal threat and refine a solution

HS-LS2-7 "Evaluate and assess impacts on the environment and biodiversity in order to refine or design a solution for detrimental impacts or enhancement for positive impacts."

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Underline two ways parking-lot lights affect living things, circle a tradeoff in the proposed solutions, and number the measurements the town would use to judge whether its plan works.

Which Way to the Water?

1 At a beach beside a public parking lot, volunteers noticed newly hatched sea turtles crawling toward the lot instead of the ocean on several summer nights. Hatchlings usually find the brighter, open horizon over the water. Bright parking-lot lamps can compete with that natural cue, leading hatchlings toward roads, dehydration, or predators. Light also attracts some night-flying insects and changes where they gather. A dark beach is not automatically a healthy beach, however: storms, beach barriers, and predators can also harm hatchlings. The town needs a plan that addresses lighting without ignoring other causes.

2 One proposal is to turn off every parking-lot lamp during nesting season. That could reduce confusing light, but the lot is still used after sunset, so visitors need enough light to walk safely. A second proposal replaces tall, unshielded lamps with low, fully shielded fixtures aimed away from the beach. Warm-colored bulbs and motion sensors would limit light that spills onto sand while leaving paths lit when people use them. The town can also keep trash bins closed to avoid attracting predators. These changes target two likely threats, but no fixture can guarantee that every hatchling reaches water.

3 Before installing new fixtures everywhere, the town could test them along one section of the lot. Volunteers would record how many hatchling groups move toward the ocean and how many move toward the lot, both before and after the change. They would also measure light reaching the sand and ask visitors whether the path is visible. Counts alone could mislead if storms or nest locations differ between years, so volunteers should note those conditions and compare a similar beach section with unchanged lamps. If hatchlings still turn inland, the town could add stronger shields or move fixtures farther from the sand.

2 ANSWER WITH EVIDENCE

Use the passage

1. How could the existing lamps affect two kinds of animals at this beach?

2. Which lighting proposal better balances hatchling protection with visitor safety? Use details from the passage to justify your choice.

3. Why would a count of hatchlings moving toward the ocean after the change, by itself, be weak evidence that the new lights worked?

4. Suppose visitors can see the path, but light still reaches the sand and hatchlings still turn inland. How should the town refine its plan, and what change would indicate improvement?

3 YOUR TURN

Your own words

Design one additional action, not proposed in the passage, to protect hatchlings at this beach. In 3 to 5 sentences, explain how it could help, one possible drawback, and what evidence you would collect to judge its effect.

ANSWER KEY

Lights on the Beach

HIGH SCHOOL · HS-LS2-7

PART 1 · READ AND MARK

Underline two ways parking-lot lights affect living things, circle a tradeoff in the proposed solutions, and number the measurements the town would use to judge whether its plan works. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	How could the existing lamps affect two kinds of animals at this beach?	**The lamps can draw hatchlings away from the ocean and attract night-flying insects, changing where the insects gather.**
2	Which lighting proposal better balances hatchling protection with visitor safety? Use details from the passage to justify your choice.	**Shielded fixtures aimed away from the beach better balance both needs because they limit light on the sand while lighting paths when visitors use them. Turning off every lamp could leave visitors without enough light to walk safely.**
3	Why would a count of hatchlings moving toward the ocean after the change, by itself, be weak evidence that the new lights worked?	**There would be no count from before the change for comparison. Storms or different nest locations could also affect the count, so the town should note those conditions and compare a similar section with unchanged lamps.**
4	Suppose visitors can see the path, but light still reaches the sand and hatchlings still turn inland. How should the town refine its plan, and what change would indicate improvement?	**The town could add stronger shields or move fixtures farther from the sand. Less light on the sand and more hatchling groups moving toward the ocean would indicate improvement.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

The town could install an opaque fence along the beach-facing edge of the parking lot to block light from reaching the sand. A poorly placed fence might block beach access, so it should stay outside nesting areas and include marked access points. Volunteers could measure light on the sand and record hatchling direction near the fence and at a similar unfenced section. Less light and fewer hatchlings turning inland near the fence would support keeping it.

Accept other feasible actions if the response explains a likely benefit for hatchlings, a plausible drawback, and evidence that could test the action's effect. For the questions, accept equivalent comparisons and refinements grounded in the passage.