Shells on the Sand

Use population data to investigate natural selection.

L.8.4B.1 "Analyze and interpret data (e.g., pictures, graphs) to explain how natural selection may lead to increases and decreases in specific traits in populations over time."

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Underline the evidence about which snails may survive and reproduce. Circle the two shell colors, then number the generations in order to track how the population changes.

A Changing Snail Population

1 On a pale sandbar, some small snails hatch with light shells and others with dark shells. Shell color is inherited. Shorebirds hunt by sight, so a dark snail may stand out against the sand. Researchers counted 100 snails from the same sandbar in each of three generations. Their counts appear in the table.

SNAILS SAMPLED ON THE SANDBAR

Generation	Light shells	Dark shells
1	20	80
4	45	55
8	75	25

2 The table reports samples, not the exact number of every snail alive. Each row adds to 100, so the counts also show percentages. The sand stayed pale during the study, and shorebirds were common. A shell color that helps a snail avoid being eaten may give it more chances to reproduce and pass that color to offspring.

3 If lighter snails survived and produced more young, light shells could become more common over generations while dark shells became less common. These data fit that explanation, but they do not prove why the change happened. Snails from another sandbar might have moved in. Researchers would need more evidence about survival, reproduction, and movement.

2 ANSWER WITH EVIDENCE

Use the passage

1. From generation 1 to generation 4, which shell color became more common in the samples? By how many snails out of 100?

2. From generation 4 to generation 8, how did the number of dark-shelled snails change?

3. Use the first and last rows of the table and the facts about the sandbar to explain how natural selection may have changed this population.

4. Why do the changing counts alone not prove that shorebirds caused the change in shell colors?

3 YOUR TURN

Your own words

In another population, a sample of 100 beetles has 20 with thick body armor and 80 with thin armor. Several generations later, a sample of 100 has 65 with thick armor and 35 with thin armor. Birds can crush thin-armored beetles more easily. Write three sentences that describe how both traits changed, explain how natural selection could cause the change, and name one other possible cause.

ANSWER KEY

Shells on the Sand

GRADE 8 · L.8.4B.1

PART 1 · READ AND MARK

Underline the evidence about which snails may survive and reproduce. Circle the two shell colors, then number the generations in order to track how the population changes. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	From generation 1 to generation 4, which shell color became more common in the samples? By how many snails out of 100?	**Light shells increased from 20 to 45 snails out of 100, an increase of 25.**
2	From generation 4 to generation 8, how did the number of dark-shelled snails change?	**Dark-shelled snails decreased from 55 to 25 out of 100, a drop of 30.**
3	Use the first and last rows of the table and the facts about the sandbar to explain how natural selection may have changed this population.	**Light shells rose from 20 to 75 out of 100, while dark shells fell from 80 to 25. On pale sand, birds may spot and eat more dark snails, leaving more light snails to reproduce and pass on light shells.**
4	Why do the changing counts alone not prove that shorebirds caused the change in shell colors?	**The counts do not show which snails survived or reproduced. Snails moving in from another sandbar could also have changed the samples.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

Thick armor rose from 20 to 65 beetles out of 100, while thin armor fell from 80 to 35. If armor is inherited, birds may eat more thin-armored beetles, leaving more thick-armored beetles to reproduce. Beetles moving in from another area could also change the counts.

Accept explanations that connect an inherited trait to different chances of survival and reproduction, while treating the counts as evidence rather than proof. For the open task, accept another plausible cause, such as differences between the two samples.