# Shells on Stone

Ask questions about how a population changes over generations.

**7.17** "Ask questions to clarify how natural selection over generations may lead to changes in the frequency of specific traits to enhance survival and reproduction of a population."

NAME _____ DATE _____

## 1 READ AND MARK

Read it twice

**YOUR JOB** Underline the change in the ground and circle the inherited trait. Then write 1, 2, and 3 beside evidence of different survival, offspring, and the later change in the population.

### Beetles After the Eruption

1. On an island, small beetles once lived among pale stones. Most had light brown shells, but a few had dark shells. Shell color varied because beetles inherited different versions of genes from their parents. In daylight, hungry birds searched the stones for beetles. Light beetles were harder to spot against the pale ground, so many survived long enough to lay eggs. Then a volcanic eruption covered part of the island with dark rock. Some beetles settled there after the rock cooled, and the ground beneath them no longer matched their shells.

2. On the dark rock, a light shell stood out to hunting birds. A dark shell blended in better, though a dark beetle could still be caught. Over many days, birds ate a larger share of light beetles than dark beetles in that area. The dark beetles that escaped were more likely to survive, mate, and lay eggs. Their young could inherit dark shells. The rocks did not turn a light beetle dark, and a beetle could not choose the shell color its young would inherit.

3. After several generations on the dark rock, field researchers found that dark beetles made up a larger share of the beetles there than before. Light beetles had not disappeared, and both colors still appeared among the young. The change happened because beetles with dark shells, on average, left more offspring that survived in that setting. On the pale stones, a light shell could still help a beetle avoid birds. The advantage of one shell color depended on where the beetles lived, not on which color was always best.

## 2 ANSWER WITH EVIDENCE

Use the passage

1. Ask a question that would clarify where the two shell colors came from before the eruption. Answer it using the passage.

2. Ask a question that would clarify how the dark rock changed which beetles birds caught. Answer it using the passage.

3. Ask a question that would clarify how surviving beetles could pass shell color to the next generation. Answer it using the passage.

4. Ask a question that would clarify why dark shells became more common over generations, rather than beetles changing color during their lives. Answer it using the passage.

## 3 YOUR TURN

Your own words

On a second island, beetles have inherited striped or plain shells. In a new grassland habitat, striped beetles are harder for birds to see. Write three clarifying questions a researcher should ask about survival, offspring and inheritance, and shell-color frequency across generations. After each question, name evidence that would help answer it.

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## PART 1 · READ AND MARK

Underline the change in the ground and circle the inherited trait. Then write 1, 2, and 3 beside evidence of different survival, offspring, and the later change in the population. Accept any marking that follows this job and points at the right text.

## PART 2 · ANSWERS

| # | QUESTION | ANSWER |
|---|---|---|
| 1 | Ask a question that would clarify where the two shell colors came from before the eruption. Answer it using the passage. | **Question: Did dark shells appear only after the eruption? Answer: No. A few beetles already had dark shells, and beetles inherited shell color from their parents.** |
| 2 | Ask a question that would clarify how the dark rock changed which beetles birds caught. Answer it using the passage. | **Question: Which beetles were easier for birds to spot on the dark rock? Answer: Light beetles stood out, and birds ate a larger share of them than dark beetles.** |
| 3 | Ask a question that would clarify how surviving beetles could pass shell color to the next generation. Answer it using the passage. | **Question: Could the dark beetles that survived have young with dark shells? Answer: Yes. They could mate and lay eggs, and their young could inherit dark shells.** |
| 4 | Ask a question that would clarify why dark shells became more common over generations, rather than beetles changing color during their lives. Answer it using the passage. | **Question: Did individual beetles turn dark on the new rock? Answer: No. Dark beetles, on average, left more surviving offspring, so dark shells made up a larger share after several generations.** |

## PART 3 · YOUR TURN (SAMPLE ANSWER)

Do striped beetles survive bird hunting more often than plain beetles in the grassland? Counts of each type caught by birds would help answer this. Do surviving striped beetles have more young, and do those young inherit stripes? Counts of offspring and their shell patterns would help. Does the share of striped beetles increase over generations? Counts of striped and plain beetles in each generation would show whether it does.

Accept different clarifying questions when they target the stated cause-and-effect link and the answers to Parts 1 and 2 are supported by the passage. For Part 3, look for evidence about survival, inherited traits in offspring, and trait frequency across generations.