

Beaks Through Drought

Use evidence to explain how traits and changing conditions affect a population.

S7L5.b "Construct an explanation based on evidence that describes how genetic variation and environmental factors influence the probability of survival and reproduction of a species."

NAME _____

DATE _____

1 READ AND MARK _____ Read it twice

YOUR JOB Underline words that describe inherited variation, circle words that describe an environmental change, and number two sentences that connect a trait to survival or reproduction.

Finches in a Dry Season

- ① On a small island, a population of ground finches eats mostly seeds. Individual finches are not genetically identical. Some inherit genes linked to deeper, stronger beaks, while others inherit genes linked to narrower beaks. Before a drought, the island has many small, soft seeds. Both beak types can find food, so many birds survive and raise young.
- ② Then a long drought changes the environment. Plants produce fewer small seeds, and hard, large seeds become more common. Finches with deeper beaks can crack more of these seeds. In one study season, researchers recorded how many adults of each beak group survived the drought and later fed chicks. The data show a difference in both survival and reproduction.

FINCH DATA FROM ONE DROUGHT SEASON

Beak group	Adults observed	Adults that survived drought	Survivors that fed chicks
Deeper beaks	20	15	12
Narrower beaks	20	8	5

- ③ Drought did not give a finch a new beak during its lifetime. Inherited variation existed in the population. Deeper-beaked survivors were more likely to feed chicks, and their offspring could inherit alleles associated with deeper beaks. If dry conditions continue for many generations, deeper-beak alleles may become more common. This population change is not a choice by a bird.

2 ANSWER WITH EVIDENCE _____ Use the passage

1 What inherited variation was present in the finch population?

2 How did the drought change the finches' environment, and which beak trait helped birds get food?

3 Use the table to compare the two beak groups. Which group had more adults survive and more survivors feed chicks?

4 Explain why deeper-beak alleles may become more common if dry conditions continue. Use one piece of evidence from the table.

3 YOUR TURN _____ Your own words

On a rocky shore, crabs have inherited variation in shell color, with some light and some dark. A wildfire leaves dark ash on the rocks, and gulls more easily see light crabs. Explain how this environmental change could affect survival and reproduction over generations. Write exactly three sentences and use the details as evidence.

PART 1 • READ AND MARK

Underline words that describe inherited variation, circle words that describe an environmental change, and number two sentences that connect a trait to survival or reproduction. Accept any marking that follows this job and points at the right text.

PART 2 • ANSWERS

#	QUESTION	ANSWER
1	What inherited variation was present in the finch population?	Some finches inherited genes linked to deeper, stronger beaks, while others inherited genes linked to narrower beaks.
2	How did the drought change the finches' environment, and which beak trait helped birds get food?	The drought caused fewer small, soft seeds and more hard, large seeds. Deeper, stronger beaks helped finches crack the hard seeds.
3	Use the table to compare the two beak groups. Which group had more adults survive and more survivors feed chicks?	The deeper-beak group had more adults survive, 15 compared with 8, and more survivors feed chicks, 12 compared with 5.
4	Explain why deeper-beak alleles may become more common if dry conditions continue. Use one piece of evidence from the table.	In dry conditions, finches with deeper beaks are more likely to find and crack hard seeds. The table shows that 15 deeper-beaked adults survived, compared with 8 narrower-beaked adults, and more deeper-beaked survivors fed chicks. Their offspring could inherit alleles associated with deeper beaks.

PART 3 • YOUR TURN (SAMPLE ANSWER)

Dark crabs may be harder for gulls to see on ash-covered rocks, so they have a higher probability of surviving. More surviving dark crabs may reproduce and pass alleles for darker shells to offspring. Over generations, darker-shell alleles may become more common in the population.

Accept explanations that identify inherited shell-color variation, connect dark ash to a survival advantage for dark crabs, and connect greater survival to a higher probability of reproduction. Students should describe probability, not claim that every dark crab survives or reproduces.