Beaks Under Pressure

Trace how inherited traits and a changing environment shape a population.

L.8.4A "Students will demonstrate an understanding of the process of natural selection, in which variations in a population increase some individuals' likelihood of surviving and reproducing in a changing environment..."

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Underline inherited traits, circle environmental pressures, and number three steps that show how the finch population changed over generations.

When Seeds Became Scarce

1. In 1835, Charles Darwin visited the Galápagos Islands during the voyage of the HMS Beagle. He collected birds from several islands, including finches and mockingbirds. Back in Britain, bird expert John Gould helped identify differences among the specimens. Darwin compared these findings with reports about the islands' different conditions. He began to ask how populations could change over generations instead of staying fixed. Later, in *On the Origin of Species*, he proposed natural selection: inherited differences can affect which organisms leave offspring.

2. Many years later, scientists Peter and Rosemary Grant studied finches on a Galápagos island. During a severe drought in 1977, small, soft seeds became scarce, while larger, harder seeds remained. Finches already differed in beak size, a trait influenced by inherited genes. Birds with deeper beaks could crack the hard seeds more easily. More of these birds survived the drought and later reproduced than birds with smaller beaks. The drought did not make individual birds grow new beaks. Instead, it changed which inherited traits were more common among survivors.

3. Genes were only part of the story. A finch needed enough food to grow and stay healthy, and other finches competed for the limited seeds. A deep beak could help during this drought, but it would not guarantee survival if a bird found too little food. When surviving birds had young, some young inherited traits linked to deeper beaks. Across generations, the population's average beak depth increased. The Grants' observations provide direct evidence for a process Darwin had proposed from earlier observations and comparisons.

2 ANSWER WITH EVIDENCE

Use the passage

1. How did Darwin's bird specimens and the Grants' observations provide different evidence for natural selection?

2. Trace how the drought led to an increase in the population's average beak depth across generations.

3. How did inherited beak traits and access to food work together to affect a finch's growth, survival, and reproduction?

4. Why is it incorrect to say that the drought made each finch develop a deeper beak?

3 YOUR TURN

Your own words

On an island, mice inherit either brown or white fur. Snow melts, exposing dark ground, and seeds become scarce while owls hunt the mice. In four or five sentences, explain how fur color, food, and owls could affect growth, survival, reproduction, and the mouse population over generations.

ANSWER KEY

Beaks Under Pressure

GRADE 8 · L.8.4A

PART 1 · READ AND MARK

Underline inherited traits, circle environmental pressures, and number three steps that show how the finch population changed over generations. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	How did Darwin's bird specimens and the Grants' observations provide different evidence for natural selection?	**Differences among Darwin's specimens helped him propose that populations change. The Grants observed how a drought affected which finches survived and reproduced.**
2	Trace how the drought led to an increase in the population's average beak depth across generations.	**The drought left mostly hard seeds. More deep-beaked finches could eat them, survive, and reproduce, so traits linked to deeper beaks became more common in later generations.**
3	How did inherited beak traits and access to food work together to affect a finch's growth, survival, and reproduction?	**An inherited deeper beak helped a finch crack hard seeds, but it still needed to find enough food to grow and stay healthy. Finches that survived could later reproduce.**
4	Why is it incorrect to say that the drought made each finch develop a deeper beak?	**Finches already differed in beak size. The drought changed which birds survived and reproduced, not the beaks of individual birds.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

Brown and white fur are inherited traits, so the mice already differ when the snow melts. Owls may spot white mice more easily on the dark ground, making brown mice more likely to survive. Scarce seeds can limit how well any mouse grows, even if its fur helps it avoid owls. Brown mice that find enough food may survive and have more young than white mice. If their young inherit brown fur, brown fur could become more common over generations.

Accept explanations that distinguish an inherited trait from environmental factors and link survival to reproduction across generations. Do not accept claims that individual mice change fur color because the snow melts.