Clues to Change

Trace how evidence helped Darwin explain natural selection

L.8.4A.1 "Use various scientific resources to analyze the historical findings of Charles Darwin to explain basic principles of natural selection."

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Underline one finding about island birds and one about pigeons, then circle a resource Darwin used to study each finding. In the last paragraph, number these steps in order: an inherited difference, a difference in survival and reproduction, and a change over generations.

From Specimens to an Explanation

1. In 1835, Charles Darwin collected mockingbirds on several Galápagos Islands. He labeled specimens by island and recorded where he found them in his field notes. Back in England, bird expert John Gould studied the preserved birds and identified distinct species from different islands. Together, the labels and Gould's examination showed that nearby islands held related but different birds. Darwin did not watch one species turn into another. Instead, these scientific resources helped him ask whether populations from a shared ancestor could change after living apart for many generations.

2. Darwin also studied pigeons. He examined their bodies and learned from breeders' records that young pigeons often inherit traits from their parents. Breeders chose which birds would reproduce, and over generations their flocks developed striking differences in feathers and body shape. These observations showed Darwin that inherited variation gives a population material for change. A breeder makes the choice in this example, so pigeon breeding does not prove how change happens in nature. It does, however, show how repeated differences in reproduction can shift traits across generations.

3. Another resource was an essay by Thomas Malthus about populations and limited supplies. Darwin reasoned that wild organisms produce more young than their environment can support. Imagine that some island birds inherit beaks better suited to cracking hard seeds during a drought. If those birds survive and raise more young, their beak traits may become more common over generations. This is natural selection: inherited differences affect survival and reproduction under particular conditions. Darwin's island specimens were observations; the drought example is a model of a possible process, not an event his notes documented.

2 ANSWER WITH EVIDENCE

Use the passage

1. How did Darwin's specimen labels and Gould's examination work together to support the idea that island populations can change?

2. What did pigeon studies show Darwin about inherited traits and change over generations? Why did he need more than pigeon breeding to explain change in nature?

3. How did Malthus's idea about limited supplies help Darwin explain why an inherited trait might become more common in a wild population?

4. Which part of the passage reports evidence from Darwin's island study, and which part models a possible process? Explain why the difference matters.

3 YOUR TURN

Your own words

Invent a natural-selection scenario involving a wild plant or animal other than a bird. In 4 to 5 sentences, explain an inherited difference, an environmental challenge, which individuals leave more offspring, and how the population changes over generations; name two scientific resources that could test your explanation.

ANSWER KEY

Clues to Change

GRADE 8 · L.8.4A.1

PART 1 · READ AND MARK

Underline one finding about island birds and one about pigeons, then circle a resource Darwin used to study each finding. In the last paragraph, number these steps in order: an inherited difference, a difference in survival and reproduction, and a change 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 specimen labels and Gould's examination work together to support the idea that island populations can change?	**The labels showed which island each bird came from, and Gould identified distinct species on different islands. Together, the evidence suggested that related populations could change after living apart.**
2	What did pigeon studies show Darwin about inherited traits and change over generations? Why did he need more than pigeon breeding to explain change in nature?	**Breeders' records and pigeons showed that young inherit differences and that choosing which birds reproduce can shift traits over generations. Breeders make those choices, so the studies did not explain what causes differences in reproduction in the wild.**
3	How did Malthus's idea about limited supplies help Darwin explain why an inherited trait might become more common in a wild population?	**When more young are produced than an environment can support, not all survive and reproduce. Individuals with a helpful inherited trait may leave more young, making that trait more common over generations.**
4	Which part of the passage reports evidence from Darwin's island study, and which part models a possible process? Explain why the difference matters.	**The labeled mockingbird specimens and Gould's identifications are evidence from the island study. The drought and hard-seed example models how natural selection might work; Darwin's notes did not document that event.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

In a wild grass population, some plants inherit greater tolerance for salty soil. After saltwater floods the meadow, many less tolerant plants fail to produce seeds. Salt-tolerant plants leave more seeds than other plants. Over generations, salt tolerance may become more common in the population. Field records of soil salt levels and growth tests of seeds collected in different years could test this explanation.

Accept other evidence-based explanations that distinguish Darwin's observations from his proposed mechanism. For the open task, the two resources should be capable of testing the student's specific scenario.