

Island Lizard Evidence

Trace how inherited variation and environmental change shape populations.

LS.11 "The student will investigate and understand that populations of organisms can change over time. Key ideas include mutation, adaptation, natural selection, and extinction change populations; the fossil record, genetic information..."

NAME _____

DATE _____

1 READ AND MARK _____ Read it twice

YOUR JOB Underline statements that describe a cause of population change, and circle each kind of evidence scientists use to study evolution.

Lizards on Changing Rocks

- ① On a rocky island, a population of lizards includes individuals with different toe-pad sizes. Some hatchlings have slightly wider pads because they inherit gene versions from their parents. A mutation, which is a change in DNA, can create a new gene version. Mutations do not appear because an organism needs them. They occur before any benefit is known. Genetic variation gives a population several traits that may matter when conditions change in the future. It does not guarantee that every trait will help.
- ② After a hurricane removes many shrubs, lizards spend more time climbing smooth, exposed rocks. Lizards with wider toe pads are more likely to hold on, avoid predators, and leave offspring. This is natural selection: an environmental condition causes some inherited traits to lead to more reproduction than others. Over many generations, wider-pad gene versions can become more common. An individual lizard does not adapt by changing its inherited genes during its lifetime. Instead, the population changes as trait frequencies shift.
- ③ Scientists test this explanation with several kinds of evidence. Fossils in older rock layers show related lizard forms that lived before the hurricane, although fossils rarely preserve every population. DNA comparisons can show how closely island lizards are related and can identify gene versions linked to toe-pad traits. Anatomical comparisons, such as matching bone patterns in lizard legs, also support common ancestry. If conditions become too extreme and no members of a species can survive and reproduce, the species may disappear. This is extinction, and it reduces biodiversity.

2 ANSWER WITH EVIDENCE _____ Use the passage

1 Why were different toe-pad sizes present in the lizard population before the hurricane?

2 Use the passage to explain how wider toe pads could become more common after many generations.

3 How can DNA comparisons and anatomical comparisons each provide evidence that organisms share common ancestry?

4 What is the difference between a population changing over generations and one lizard changing during its lifetime? What may happen if no members of a species can survive and reproduce?

3 YOUR TURN _____ Your own words

Create a three-panel sketch showing how a drought that leaves mostly large, hard seeds could change a population of seed-eating birds with different beak sizes. Label each panel with key details, then write one sentence explaining why this is natural selection, not a change made by one bird.

		
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PART 1 • READ AND MARK

Underline statements that describe a cause of population change, and circle each kind of evidence scientists use to study evolution. Accept any marking that follows this job and points at the right text.

PART 2 • ANSWERS

#	QUESTION	ANSWER
1	Why were different toe-pad sizes present in the lizard population before the hurricane?	Lizards inherited different gene versions from their parents. Mutations can create new gene versions before an environmental challenge occurs.
2	Use the passage to explain how wider toe pads could become more common after many generations.	On exposed rocks, lizards with wider toe pads are more likely to hold on, avoid predators, and leave offspring. They can pass on gene versions for wider pads, so those versions become more common over generations.
3	How can DNA comparisons and anatomical comparisons each provide evidence that organisms share common ancestry?	DNA comparisons show how closely organisms are related and can identify linked gene versions. Matching bone patterns in anatomy also support common ancestry.
4	What is the difference between a population changing over generations and one lizard changing during its lifetime? What may happen if no members of a species can survive and reproduce?	A population changes when inherited trait frequencies shift over generations, but an individual does not change its inherited genes during its lifetime. If no members survive and reproduce, the species may become extinct.

PART 3 • YOUR TURN (SAMPLE ANSWER)

Panel 1: A bird population has birds with small, medium, and large beaks before the drought. Panel 2: During the drought, mostly large, hard seeds remain, and more large-beaked birds survive and raise young. Panel 3: After many generations, more birds in the population have large beaks. Natural selection occurs because birds with an inherited trait that helps them use the available food leave more offspring, so that trait becomes more common.

Accept equivalent explanations that connect inherited variation, environmental conditions, survival and reproduction, and changes in trait frequency across generations. In the sketch, look for variation before the drought, unequal reproduction during the drought, and a population-level change afterward.