

HS-LS4-3 Biological Evolution: Unity and Diversity

California Alternate Assessment for Science—Item Content Specifications

# HS-LS4-3 Biological Evolution: Unity and Diversity

| California Science Connector | Focal Knowledge, Skills, and Abilities | Essential Understanding |
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| Recognize that data can be used to determine that organisms with advantageous heritable traits will increase in proportion over a period of time. | 1. Ability to use data to recognize that while the total number of individuals in a population may remain relatively constant, the traits represented in that population can change in response to environmental change.
 | Recognize that traits that positively affect survival are more likely to be passed on to offspring. |

## **CA NGSS Performance Expectation**

Students who demonstrate understanding can:

**Apply concepts of statistics and probability to support explanations that organisms with an advantageous heritable trait tend to increase in proportion to organisms lacking this trait.** [Clarification Statement: Emphasis is on analyzing shifts in numerical distribution of traits and using these shifts as evidence to support explanations.] *[Assessment Boundary: Assessment is limited to basic statistical and graphical analysis. Assessment does not include allele frequency calculations.]*

## Mastery Statements

Students will be able to:

* Identify which organism will most likely survive in a given environment based on a trait
* Recognize that beneficial traits promote survival
* Recognize that beneficial traits are more likely to be passed to offspring
* Identify which organism is more likely to have offspring based on varying traits in a given environment
* Recognize ways traits can change in a population based on environmental change
* Use data to identify a change in the environment which has led to an increase in the frequency of a specific trait

## Possible Phenomena or Contexts

*Note that the list in this section is not exhaustive or prescriptive.*

**Possible contexts include the following:**

* A specific variation of a trait is observed to increase over time in a given population in a given environment.
* Two populations of the same species are in two different habitats. Each population has a different variation of an advantageous trait based on features of the habitats.
* Habitats that clearly require specific adaptations to survive and reproduce successfully.

## Additional Assessment Boundaries

* None listed at this time

## Additional References

California Science Test Item Specification for HS-LS4-3

<https://www.cde.ca.gov/ta/tg/ca/documents/itemspecs-hs-ls4-3.docx>

Environmental Principles and Concepts <http://californiaeei.org/abouteei/epc/>

The *2016 Science Framework for California Public Schools Kindergarten through Grade Twelve* <https://www.cde.ca.gov/ci/sc/cf/cascienceframework2016.asp>

Appendix 1: Progression of the Science and Engineering Practices, Disciplinary Core Ideas, and Crosscutting Concepts in Kindergarten through Grade Twelve

<https://www.cde.ca.gov/ci/sc/cf/documents/scifwappendix1.pdf>

Appendix 2: Connections to Environmental Principles and Concepts

<https://www.cde.ca.gov/ci/sc/cf/documents/scifwappendix2.pdf>

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