

3-LS4-4 Biological Evolution: Unity and Diversity

Students who demonstrate understanding can:

- 3-LS4-4. Make a claim about the merit of a solution to a problem caused when the environment changes and the types of plants and animals that live there may change.*** [Clarification Statement: Examples of environmental changes could include changes in land characteristics, water distribution, temperature, food, and other organisms.] [Assessment Boundary: Assessment is limited to a single environmental change. Assessment does not include the greenhouse effect or climate change.]

The performance expectation above was developed using the following elements from the NRC document *A Framework for K-12 Science Education*:

Science and Engineering Practices

Engaging in Argument from Evidence

Engaging in argument from evidence in 3–5 builds on K–2 experiences and progresses to critiquing the scientific explanations or solutions proposed by peers by citing relevant evidence about the natural and designed world(s).

- Make a claim about the merit of a solution to a problem by citing relevant evidence about how it meets the criteria and constraints of the problem.

Disciplinary Core Ideas

LS2.C: Ecosystem Dynamics, Functioning, and Resilience

- When the environment changes in ways that affect a place’s physical characteristics, temperature, or availability of resources, some organisms survive and reproduce, others move to new locations, yet others move into the transformed environment, and some die. *(secondary)*

LS4.D: Biodiversity and Humans

- Populations live in a variety of habitats, and change in those habitats affects the organisms living there.

Crosscutting Concepts

Systems and System Models

- A system can be described in terms of its components and their interactions.

Connections to Engineering, Technology, and Applications of Science

Interdependence of Engineering, Technology, and Science on Society and the Natural World

- Knowledge of relevant scientific concepts and research findings is important in engineering.

Observable features of the student performance by the end of the grade:

1	Supported claims
a	Students make a claim about the merit of a given solution to a problem that is caused when the environment changes, which results in changes in the types of plants and animals that live there.
2	Identifying scientific evidence
a	Students describe the given evidence about how the solution meets the given criteria and constraints. This evidence includes:
i.	A system of plants, animals, and a given environment within which they live before the given environmental change occurs.
ii.	A given change in the environment.
iii.	How the change in the given environment causes a problem for the existing plants and animals living within that area.
iv.	The effect of the solution on the plants and animals within the environment.
v.	The resulting changes to plants and animals living within that changed environment, after the solution has been implemented.
3	Evaluating and critiquing evidence
a	Students evaluate the solution to the problem to determine the merit of the solution. Students describe how well the proposed solution meets the given criteria and constraints to reduce the impact of the problem created by the environmental change in the system, including:
i.	How well the proposed solution meets the given criteria and constraints to reduce the impact of the problem created by the environmental change in the system, including:
1.	How the solution makes changes to one part (e.g., a feature of the environment) of the system, affecting the other parts of the system (e.g., plants and animals).
2.	How the solution affects plants and animals.

	b	Students evaluate the evidence to determine whether it is relevant to and supports the claim.
	c	Students describe whether the given evidence is sufficient to support the claim, and whether additional evidence is needed.