

Educational Resources from *Phenomenon Science Education*

Student Proficiency Goals for **NGSS MS-LS1-4**



Information about MS-LS1-4

NGSS Performance Expectation MS-LS1-4.

Use argument based on empirical evidence and scientific reasoning to support an explanation for how characteristic animal behaviors and specialized plant structures affect the probability of successful reproduction of animals and plants respectively.

Clarification Statement.

Examples of behaviors that affect the probability of animal reproduction could include nest building to protect young from cold, herding of animals to protect young from predators, and vocalization of animals and colorful plumage to attract mates for breeding. Examples of animal behaviors that affect the probability of plant reproduction could include transferring pollen or seeds, and creating conditions for seed germination and growth. Examples of plant structures could include bright flowers attracting butterflies that transfer pollen, flower nectar and odors that attract insects that transfer pollen, and hard shells on nuts that squirrels bury.

Assessment Limits.

No specific assessment limits are listed for this Performance Expectation.

Science and Engineering Practice (Engaging in Argument from Evidence)

- Use an oral and written argument supported by empirical evidence and scientific reasoning to support or refute an explanation or a model for a phenomenon or a solution to a problem.

Disciplinary Core Idea (LS1.B: Growth and Development of Organisms)

- Animals engage in characteristic behaviors that increase the odds of reproduction.
- Plants reproduce in a variety of ways, sometimes depending on animal behavior and specialized features for reproduction.

Crosscutting Concept (Cause and Effect)

- Phenomena may have more than one cause, and some cause and effect relationships in systems can only be described using probability.

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Student Proficiency Goals

SEP (Engaging in Argument from Evidence):

- Students identify and describe a claim related to phenomena or problems, or models of the phenomena or problems, that are examples of the idea that characteristic animal behaviors and specialized plant structures affect the probability of successful reproduction of those animals and plants, respectively.
- Students identify and describe evidence that supports or refutes their claim.
- Students collect evidence that supports or refutes their claim.
- Students identify strengths and weaknesses in the collected evidence, including the type of source the evidence came from and the relevance, validity, and reliability of the evidence.
- Students identify strengths and weaknesses in the ability of the evidence to support their claim.
- Students use reasoning to link evidence to their claim.
- Students construct a written argument that supports or refutes explanations for phenomena, models of the phenomena, or solutions to problems.
- Students use oral arguments to support or refute explanations for phenomena, models of the phenomena, or solutions to problems.

DCI (LS1.B Growth and Development of Organisms):

- Students know that animals increase their odds of reproduction by engaging in characteristic behaviors.
- Students know that plants reproduce in a variety of ways.
- Students know that specialized plant structures increase the odds of reproduction.
- Students know that reproduction for certain plants depends on the behaviors of certain animals.
- Students know that reproduction for certain plants depends on a combination of animal behavior and specialized plant structures.

CCC (Cause and Effect):

- Students consider that some phenomena related to successful reproduction of plants and animals have more than one cause.
- Students consider that, in interrelated systems associated with the successful reproduction of plants and animals, some cause and effect relationships can only be described using probability.