

MS-LS1-4 From Molecules to Organisms: Structures and Processes

California Science Test—Item Content Specifications

# MS-LS1-4 From Molecules to Organisms: Structures and Processes

Students who demonstrate understanding can:

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.]

Continue to the next page for the Science and Engineering Practices, Disciplinary Core Ideas, and Crosscutting Concepts.

| Science and Engineering Practices | Disciplinary Core Ideas | Crosscutting Concepts |
| --- | --- | --- |
| Engaging in Argument from Evidence  Engaging in Argument from Evidence Engaging in argument from evidence in 6–8 builds on K–5 experiences and progresses to constructing a convincing argument that supports or refutes claims for either explanations or solutions about the natural and designed world(s).  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. | LS1.B: Growth and Development of Organisms  3. Animals engage in characteristic behaviors that increase the odds of reproduction.  5. Plants reproduce in a variety of ways, sometimes depending on animal behavior and specialized features for reproduction. | Cause and Effect  Phenomena may have more than one cause, and some cause and effect relationships in systems can only be described using probability. |

## Assessment Targets

Assessment targets describe the focal knowledge, skills, and abilities for a given three-dimensional Performance Expectation. Please refer to the Introduction for a complete description of assessment targets.

### Science and Engineering Subpractice(s)

Please refer to appendix A for a complete list of Science and Engineering Practices (SEP) subpractices. Note that the list in this section is not exhaustive.

7.1 Ability to construct scientific arguments

### Science and Engineering Subpractice Assessment Targets

Please refer to appendix A for a complete list of SEP subpractice assessment targets. Note that the list in this section is not exhaustive.

7.1.1 Ability to identify evidence/data that supports a claim

7.1.2 Ability to develop scientific arguments that are supported by evidence/data

7.1.3 Ability to use reasoning to explain how relevant evidence/data supports or refutes the claim; the reasoning should reflect application of scientific concepts, principles, ideas, and models

### Disciplinary Core Idea Assessment Targets

#### LS1.B.3

* Recognize that characteristic animal behaviors increase the probability of successful reproduction in animal species that exhibit those behaviors
* Describe specific animal behaviors involved in reproduction

#### LS1.B.5

* Recognize specialized plant structures that increase the probability of successful reproduction in plant species that have those structures
* Recognize the animal behaviors that are likely to increase the probability of successful plant reproduction

### Crosscutting Concept Assessment Target(s)

CCC2 Identify that phenomena may have more than one cause, and some cause and effect relationships in systems can only be described using probability

## Examples of Integration of Assessment Targets and Evidence

Note that the list in this section is not exhaustive.

Task provides data comparing the reproductive success rates of different animals with/without selected behavior(s):

* Identifies patterns in the data and justifies the identification (7.1.1, LS1.B.3, and CCC2)
* Uses the data to support an argument about how a characteristic animal behavior relates to reproductive success in animals that exhibit that behavior (7.1.1, LS1.B.3, and CCC2)

Task provides evidence or data and an argument that a specialized plant structure increases the chances of reproductive success:

* Identifies evidence that is irrelevant or invalid and would not support the argument (7.1.2, LS1.B.5, and CCC2)

Task provides several sources of evidence or data and an argument that a specialized plant structure increases the chances of reproductive success:

* Identifies the evidence that would support the argument (7.1.2, LS1.B.5, and CCC2)

Task provides a claim that animal behaviors can improve the reproductive success of plants:

* Provides a reasoned explanation of data that would support the claim (7.1.3, LS1.B.5, and CCC2)
* Provides examples of animal behaviors and how they can improve the reproductive success of plants (7.1.3, LS1.B.5, and CCC2)

## California Environmental Principles and Concepts

* EP2: The long-term functioning and health of terrestrial, freshwater, coastal, and marine ecosystems are influenced by their relationships with human societies.
* EP4: The exchange of matter between natural systems and human societies affects the long-term functioning of both.

## Possible Phenomena or Contexts

Note that the list in this section is not exhaustive.

* Courtship behaviors involved in attracting a mate
* Behaviors that provide organisms and their offspring with shelter, food, and protection from predation
* Flower characteristics that attract birds, bats, and insects for pollination
* Adaptations that facilitate seed dispersal by gravity, wind, water, or animals

## Common Misconceptions

Note that the list in this section is not exhaustive.

* Animal behaviors do not influence the reproductive success of plants.
* Plants produce flowers and fruits as a service to other organisms.

## Additional Assessment Boundaries

None listed at this time.

## Additional References

MS-LS1-4 Evidence Statement [https://www.nextgenscience.org/sites/default/files/evidence\_statement/black\_white/MS-LS1-4 Evidence Statements June 2015 asterisks.pdf](https://www.nextgenscience.org/sites/default/files/evidence_statement/black_white/MS-LS1-4%20Evidence%20Statements%20June%202015%20asterisks.pdf)

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

California Education and the Environment Initiative <http://californiaeei.org/>

The *2016 Science Framework for California Public Schools Kindergarten through Grade 12*

Appendix 1: Progression of the Science and Engineering Practices, Disciplinary Core Ideas, and Crosscutting Concepts in Kindergarten through Grade 12 <https://www.cde.ca.gov/ci/sc/cf/documents/scifwappendix1.pdf>

Appendix 2: Connections to California Environmental Principles and Concepts <https://www.cde.ca.gov/ci/sc/cf/documents/scifwappendix2.pdf>

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