

MS-LS2-2 Ecosystems: Interactions, Energy, and Dynamics

California Science Test—Item Content Specifications

# MS-LS2-2 Ecosystems: Interactions, Energy, and Dynamics

Students who demonstrate understanding can:

Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems.

[Clarification Statement: Emphasis is on predicting consistent patterns of interactions in different ecosystems in terms of the relationships among and between organisms and abiotic components of ecosystems. Examples of types of interactions could include competitive, predatory, and mutually beneficial.]

| Science and Engineering Practices | Disciplinary Core Ideas | Crosscutting Concepts |
| --- | --- | --- |
| Constructing Explanations and Designing Solutions  Constructing explanations and designing solutions in 6–8 builds on K–5 experiences and progresses to include constructing explanations and designing solutions supported by multiple sources of evidence consistent with scientific ideas, principles, and theories.  Construct an explanation that includes qualitative or quantitative relationships between variables that predict phenomena. | LS2.A: Interdependent Relationships in Ecosystems  7. Similarly, predatory interactions may reduce the number of organisms or eliminate whole populations of organisms. Mutually beneficial interactions, in contrast, may become so interdependent that each organism requires the other for survival. Although the species involved in these competitive, predatory, and mutually beneficial interactions vary across ecosystems, the patterns of interactions of organisms with their environments, both living and nonliving, are shared. | Patterns  Patterns can be used to identify cause and effect relationships. |

## 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.

6.1 Ability to construct explanations of phenomena

### 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.

6.1.1 Ability to construct quantitative and/or qualitative explanations of observed relationships based on valid and reliable evidence

6.1.2 Ability to apply scientific concepts, principles, theories, and big ideas to construct an explanation of a real-world phenomenon

6.1.3 Ability to use models and representations in scientific explanations

### Disciplinary Core Idea Assessment Targets

#### LS2.A.7

* Construct explanations supported by multiple sources of evidence consistent with scientific ideas, principles, and theories that predict patterns of interactions among organisms across multiple ecosystems
* Construct an explanation that includes qualitative or quantitative relationships between variables that predict(s) and/or describe(s) patterns of interactions among organisms across multiple ecosystems
* Construct a scientific explanation based on valid and reliable evidence obtained from sources (including the student’s own experiments) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future about patterns of interactions among organisms across multiple ecosystems

### Crosscutting Concept Assessment Target(s)

CCC1 Use patterns to identify cause-and-effect relationships

## Examples of Integration of Assessment Targets and Evidence

Note that the list in this section is not exhaustive.

Task provides information about the interactions among species in an ecosystem:

* Identifies or predicts predatory, competitive, and/or mutually beneficial interactions (6.1.1, LS2.A.7, and CCC1)
* Identifies or describes evidence that supports the pattern of interactions (6.1.1, LS2.A.7, and CCC1)
* Uses reasoning to justify the existence of similar patterns of interactions among organisms across multiple ecosystems (6.1.1, LS2.A.7, and CCC1)
* Predicts additional interactions not explicitly specified by the data (6.1.1, LS2.A.7, and CCC1)

Task provides information or data about a specific real-world phenomenon involving species interactions:

* Explains the phenomenon by identifying the relevant predatory, competitive, and/or mutually beneficial interactions (6.1.2 and LS2.A.7)
* Uses reasoning to justify the existence of similar patterns of interactions among organisms across multiple ecosystems (6.1.2, LS2.A.7, and CCC1)

Task provides a model or representation of interactions among species in ecosystem(s):

* Describes the pattern of interactions among organisms that is represented in the model (6.1.3, LS2.A.7, and CCC1)
* Identifies evidence in the model that supports a claim about interactions among organisms (6.1.3 and LS2.A.7)

## Possible Phenomena or Contexts

Note that the list in this section is not exhaustive.

* Interspecific relationships, such as competition, predator-prey relationships, commensalism, and mutualism
* Relationships between abiotic and biotic factors in an ecosystem, such as climate and species present
* Proposals to restore ecosystems to natural state
* Description of ancient environments based on geological data
* Effect of migration of a species from one ecosystem to a different ecosystem

## Common Misconceptions

Note that the list in this section is not exhaustive.

* Introduced species are always beneficial.
* Only one type of interspecies interaction can occur in a given ecosystem.

## Additional Assessment Boundaries

None listed at this time.

## Additional References

MS-LS2-2 Evidence Statement [https://www.nextgenscience.org/sites/default/files/evidence\_statement/black\_white/MS-LS2-2 Evidence Statements June 2015 asterisks.pdf](https://www.nextgenscience.org/sites/default/files/evidence_statement/black_white/MS-LS2-2%20Evidence%20Statements%20June%202015%20asterisks.pdf)

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>

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