

HS-LS2-8 Ecosystems: Interactions, Energy, and Dynamics

California Science Test—Item Content Specifications

# HS-LS2-8 Ecosystems: Interactions, Energy, and Dynamics

Students who demonstrate understanding can:

Evaluate the evidence for the role of group behavior on individual and species’ chances to survive and reproduce.

[Clarification Statement: Emphasis is on: (1) distinguishing between group and individual behavior, (2) identifying evidence supporting the outcomes of group behavior, and (3) developing logical and reasonable arguments based on evidence. Examples of group behaviors could include flocking, schooling, herding, and cooperative behaviors such as hunting, migrating, and swarming.]

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 in 9–12 builds on K–8 experiences and progresses to using appropriate and sufficient evidence and scientific reasoning to defend and critique claims and explanations about the natural and designed world(s). Arguments may also come from current scientific or historical episodes in science.  Evaluate the evidence behind currently accepted explanations to determine the merits of arguments.  Connections to Nature of Science  Scientific Knowledge is Open to Revision in Light of New Evidence  Scientific argumentation is a mode of logical discourse used to clarify the strength of relationships between ideas and evidence that may result in revision of an explanation. | **LS2.D: Social Interactions and Group Behavior**  2. Group behavior has evolved because membership can increase the chances of survival for individuals and their genetic relatives. | Cause and Effect  Empirical evidence is required to differentiate between cause and correlation and make claims about specific causes and effects. |

## 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

7.2 Ability to compare, evaluate, and critique competing 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

7.2.1 Ability to evaluate arguments about a natural phenomenon based on scientific concepts, principles, and big ideas

7.2.3 Ability to evaluate competing perspectives/claims using reasoning and evidence

### Disciplinary Core Idea Assessment Targets

#### LS2.D.2

* Construct an argument that being a member of a group is beneficial for survival
* Construct an argument to defend the claim that group behavior has evolved because membership in a group can increase the chances of survival for individuals
* Construct an argument to defend the claim that group behavior is beneficial to genetic relatives of individuals therefore increasing fitness
* Distinguish between group and individual behavior (group behaviors include flocking, herding, schooling, etc.)
* Identify and use evidence about the outcomes of group behavior (e.g., advantages for hunting, avoiding predation, raising offspring)
* Determine the appropriate data to support a claim about the advantages of group behavior

### Crosscutting Concept Assessment Target(s)

CCC2 Identify empirical evidence to differentiate between cause and correlation and make claims about specific causes and effects

## Examples of Integration of Assessment Targets and Evidence

Note that the list in this section is not exhaustive.

Task provides a scenario illustrating causal behavioral interactions of an animal species group:

* Constructs an argument that contains 1) a claim, 2) evidence or data, and 3) the reasoning that links the evidence or data to the claim that group behavior increases individual and/or group survival (7.1.1, LS2.D.2, and CCC2)

Task provides a scenario illustrating group behavior in an animal species and a partial argument about the advantages of group behavior:

* Completes the argument by making a claim that is supported by the given evidence and reasoning (7.1.2, LS2.D.2, and CCC2)
* Completes the argument by identifying or describing evidence that would support the given claim (7.1.2, LS2.D.2, and CCC2)
* Completes the argument by providing the reasoning that connects the given evidence to the stated claim (7.1.2, LS2.D.2, and CCC2)

Task provides data comparing individual and group behavior in an animal species:

* Interprets the evidence and identifies individual vs. group behaviors (7.1.3, LS2.D.2, and CCC2)
* Explains whether the provided evidence or data is sufficient to defend the claim that group behavior provides advantages (7.1.3, LS2.D.2, and CCC2)
* Identifies additional evidence that would help support the claim that group behavior provides advantages (7.1.3, LS2.D.2, and CCC2)

Task provides an argument about the advantages of group behavior with supporting material:

* Evaluates the strength of the evidence and reasoning in each argument (7.2.1, LS2.D.2, and CCC2)
* Identifies additional evidence needed to further support a claim that group behavior increases the chances for an individual or species to survive and reproduce (7.2.1, LS2.D.2, and CCC2)
* Uses the evidence to evaluate competing claims about the outcomes of group behavior (7.2.3, LS2.D.2, and CCC2)

## Possible Phenomena or Contexts

Note that the list in this section is not exhaustive.

* Social hierarchies govern group behavior in certain species.
* Some species alternate between solitary and communal modes.
* Cooperative behaviors such as hunting, migrating, and swarming increase survival.
* Division of labor within groups leads to structural modifications.
* The Selfish Gene theory can explain altruistic behavior among individuals in a group.

## Common Misconceptions

Note that the list in this section is not exhaustive.

* Group behavior increases survival for all animals.
* Individual behaviors increase survival more than group behaviors.
* Organisms must select one type of behavior; they do not have multiple approaches to survival.

## Additional Assessment Boundaries

None listed at this time.

## Additional References

HS-LS2-8 Evidence Statement [https://www.nextgenscience.org/sites/default/files/evidence\_statement/black\_white/HS-LS2-8 Evidence Statements June 2015 asterisks.pdf](https://www.nextgenscience.org/sites/default/files/evidence_statement/black_white/HS-LS2-8%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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