

3-LS1-1 From Molecules to Organisms: Structures and Processes

California Science Test—Item Content Specifications

# 3-LS1-1 From Molecules to Organisms: Structures and Processes

Students who demonstrate understanding can:

Develop models to describe that organisms have unique and diverse life cycles but all have in common birth, growth, reproduction, and death.

[Clarification Statement: Changes organisms go through during their life form a pattern.] [*Assessment Boundary: Assessment of plant life cycles is limited to those of flowering plants. Assessment does not include details of human reproduction.*]

| Science and Engineering Practices | Disciplinary Core Ideas | Crosscutting Concepts |
| --- | --- | --- |
| Developing and Using Models  Modeling in 3–5 builds on K–2 experiences and progresses to building and revising simple models and using models to represent events and design solutions.  Develop models to describe phenomena.  Connections to Nature of Science  Scientific Knowledge is Based on Empirical Evidence  Science findings are based on recognizing patterns. | LS1.B: Growth and Development of Organisms  2. Reproduction is essential to the continued existence of every kind of organism. Plants and animals have unique and diverse life cycles. | Patterns  Patterns of change can be used to make predictions. |

## 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.

2.1 Ability to develop models

2.2 Ability to use models

### 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.

2.1.1 Ability to determine components of a scientific event, system, or design solution

2.1.2 Ability to determine the relationships among multiple components of a scientific event, system, or design solution

2.1.4 Ability to represent mechanisms, relationships, and connections to illustrate, explain or predict a scientific event

2.2.1 Ability to use models to identify concepts and relationships represented in the models

2.2.2 Ability to use models to generate explanations and predictions about a scientific phenomenon

### Disciplinary Core Idea Assessment Targets

#### LS1.B.2

* Describe that reproduction is essential for organisms
* Identify the essential parts of a life cycle common to all organisms, including a starting point (hatching, birth, etc.), growth, reproduction, and death
* Describe that plants and animals have unique and diverse life cycles
* Describe differences between life cycles of common organisms
* Use a model to make predictions related to life cycle, based on patterns identified among life cycles

### Crosscutting Concept Assessment Target(s)

CCC1 Use patterns of change to make predictions

## Examples of Integration of Assessment Targets and Evidence

Note that the list in this section is not exhaustive.

Task provides a model of a specific organism’s life cycle:

* Identifies the stages of the life cycle represented in the model (2.1.1, LS1.B.2, and CCC1)
* Explains what happens at each stage represented (2.1.1, LS1.B.2, and CCC1)

Task provides an incomplete model of an organism’s life cycle:

* Completes the model (2.1.1, LS1.B.2, and CCC1)

Task provides a model comparing life cycles of organisms from two or more species:

* Identifies the stages in common (2.2.1, LS1.B.2, and CCC1)
* Identifies the stages that are different (2.2.1, LS1.B.2, and CCC1)

## California Environmental Principles and Concepts

* EP3: Natural systems proceed through cycles that humans depend upon, benefit from, and can alter.

## Possible Phenomena or Contexts

Note that the list in this section is not exhaustive.

* Life cycles in flowering plants
* Insect and amphibian life cycles, including or excluding metamorphosis
* Prediction of changes in a population based on the disruption of the pattern of the life cycle

## Common Misconceptions

Note that the list in this section is not exhaustive.

* Sexual reproduction is common, and asexual reproduction is an exception.
* All organisms have similar life cycles.
* Organisms appear the same throughout their life cycle.

## Additional Assessment Boundaries

None listed at this time.

## Additional References

3-LS1-1 Evidence Statement <https://www.nextgenscience.org/sites/default/files/evidence_statement/black_white/3-LS1-1%20Evidence%20Statements%20June%202015%20asterisks.pdf>

[Environmental Principles and Concepts](http://californiaeei.org/abouteei/epc/) <http://californiaeei.org/abouteei/epc/>

[California Education and the Environment Initiative](http://californiaeei.org/) <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) <https://www.cde.ca.gov/ci/sc/cf/documents/scifwappendix1.pdf>

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

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