

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

Students who demonstrate understanding can:

- 3-LS1-1. 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.]

The performance expectation above was developed using the following elements from the NRC document *A Framework for K-12 Science Education*:

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
<p>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.</p> <ul style="list-style-type: none"> Develop models to describe phenomena. <p>-----</p> <p style="text-align: center;">Connections to Nature of Science</p> <p>Scientific Knowledge is Based on Empirical Evidence</p> <ul style="list-style-type: none"> Science findings are based on recognizing patterns. 	<p>LS1.B: Growth and Development of Organisms</p> <ul style="list-style-type: none"> Reproduction is essential to the continued existence of every kind of organism. Plants and animals have unique and diverse life cycles. 	<p>Patterns</p> <ul style="list-style-type: none"> Patterns of change can be used to make predictions.

Observable features of the student performance by the end of the grade:											
1	Components of the model										
a	Students develop models (e.g., conceptual, physical, drawing) to describe* the phenomenon. In their models, students identify the relevant components of their models including: <table border="1" style="width: 100%; margin-top: 5px;"> <tr><td style="background-color: #d9d9d9; text-align: center;">i.</td><td>Organisms (both plant and animal).</td></tr> <tr><td style="background-color: #d9d9d9; text-align: center;">ii.</td><td>Birth.</td></tr> <tr><td style="background-color: #d9d9d9; text-align: center;">iii.</td><td>Growth.</td></tr> <tr><td style="background-color: #d9d9d9; text-align: center;">iv.</td><td>Reproduction.</td></tr> <tr><td style="background-color: #d9d9d9; text-align: center;">v.</td><td>Death.</td></tr> </table>	i.	Organisms (both plant and animal).	ii.	Birth.	iii.	Growth.	iv.	Reproduction.	v.	Death.
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2	Relationships										
a	In the models, students describe* relationships between components, including: <table border="1" style="width: 100%; margin-top: 5px;"> <tr><td style="background-color: #d9d9d9; text-align: center;">i.</td><td>Organisms are born, grow, and die in a pattern known as a life cycle.</td></tr> <tr><td style="background-color: #d9d9d9; text-align: center;">ii.</td><td>Different organisms' life cycles can look very different.</td></tr> <tr><td style="background-color: #d9d9d9; text-align: center;">iii.</td><td>A causal direction of the cycle (e.g., without birth, there is no growth; without reproduction, there are no births).</td></tr> </table>	i.	Organisms are born, grow, and die in a pattern known as a life cycle.	ii.	Different organisms' life cycles can look very different.	iii.	A causal direction of the cycle (e.g., without birth, there is no growth; without reproduction, there are no births).				
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3	Connections										
a	Students use the models to describe* that although organisms can display life cycles that look different, they all follow the same pattern.										
b	Students use the models to make predictions related to the phenomenon, based on patterns identified among life cycles (e.g., prediction could include that if there are no births, deaths will continue and eventually there will be no more of that type of organism).										