

Unit 4 Life Cycles and Traits

Unit Summary: In this unit of study, students acquire an understanding that organisms have different inherited traits and that the environment can also affect the traits that an organism develops. Students will also develop an understanding of the similarities and differences in organisms' life cycles. In addition, students use evidence to construct an explanation for how the variations in characteristics among individuals of the same species may provide advantages in surviving, finding mates, and reproducing.

Concepts and Vocabulary: Key vocabulary may include but are not limited to: Organisms (plants and animals), Group, Parents and offspring, Inheritance, Variation, Patterns, Environmental factors (e.g. amount of food or water, exercise, chemicals), Traits (e.g. height or weight of a plant or animal, color or quantity of the flowers), Cause and Effect, Organisms [both plant (no flowering plants) and animal (no human reproduction)], Life cycles (Birth, Growth, Reproduction, Death), Patterns, Characteristics (e.g. plant thorns, animal camouflage), Variation, Individuals, Species, Effect (Surviving, Finding mates, Reproduction)

Stage 1 – Desired Results

Performance Expectations: (PE) (Established Goals / Content Standards)

3-LS3-1: Analyze and interpret data to provide evidence that plants and animals have traits inherited from parents and that variation of these traits exists in a group of similar organisms. Clarification

Statement: Patterns are the similarities and differences in traits shared between offspring and their parents, or among siblings. Emphasis is on organisms other than humans. Assessment Boundary: Assessment does not include genetic mechanisms of inheritance and prediction of traits. Assessment is limited to non-human examples.

3-LS3-2: Use evidence to support the explanation that traits can be influenced by the environment.

Clarification Statement: Examples of the environment affecting a trait could include normally tall plants grown with insufficient water are stunted; and, a pet dog that is given too much food and little exercise may become overweight.

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.

3-LS4-2: Use evidence to construct an explanation for how the variations in characteristics among individuals of the same species may provide advantages in surviving, finding mates, and reproducing.

Clarification Statement: Examples of cause and effect relationships could be plants that have larger thorns than other plants may be less likely to be eaten by predators; and, animals that have better camouflage coloration than other animals may be more likely to survive and therefore more likely to leave offspring.

Enduring Understandings (1-3 max)

Students will understand that:

Many characteristics of organisms are inherited from their parents.

Different organisms vary in how they look and function because they have different inherited information.

Plants and animals have unique and diverse life

Essential Questions (1-2 EQ per EU)

How are the characteristics of one generation passed to the next?

How can individuals of the same species and even siblings have different characteristics?

How do organisms live, grow, respond to their environment and reproduce?

cycles.	
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Science & Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
<p>Analyzing and Interpreting Data Analyze and interpret data to make sense of phenomena using logical reasoning. (3-LS3-1)</p> <p>Developing and Using Models Develop models to describe phenomena. (3-LS1-1)</p> <p>Constructing Explanations and Designing Solutions Use evidence (e.g., observations, patterns) to support an explanation. (3-LS3-2)</p> <p>Use evidence (e.g., observations, patterns) to construct an explanation. (3-LS4-2)</p>	<p>LS3.A: Inheritance of Traits Many characteristics of organisms are inherited from their parents. (3-LS3-1)</p> <p>Other characteristics result from individuals' interactions with the environment, which can range from diet to learning. Many characteristics involve both inheritance and environment. (3-LS3-2)</p> <p>LS1.B: Growth and Development of Organisms Reproduction is essential to the continued existence of every kind of organism. Plants and animals have unique and diverse life cycles. (3-LS1-1)</p> <p>LS3.B: Variation of Traits Different organisms vary in how they look and function because they have different inherited information. (3-LS3-1) The environment also affects the traits that an organism develops. (3-LS3-2)</p> <p>LS4.B: Natural Selection Sometimes the differences in characteristics between individuals of the same species provide advantages in surviving, finding mates, and reproducing. (3-LS4-2)</p>	<p>Patterns Similarities and differences in patterns can be used to sort and classify natural phenomena. (3-LS3-1)</p> <p>Patterns of change can be used to make predictions. (3-LS1-1)</p> <p>Cause and Effect Cause and effect relationships are routinely identified and used to explain change. (3-LS3-2)</p> <p>Cause and effect relationships are routinely identified and used to explain change. (3-LS4-2),(3-LS4-3)</p> <p>Connections to Nature of Science Scientific Knowledge is Based on Empirical Evidence Science findings are based on recognizing patterns. (3-LS1-1)</p>

Stage 2 – Model Assessment	
<p>Summative Performance Task(s)</p> <p>3-LS3-1, 3-LS3-2: Odd One Out Activity</p>	<p>Formative Evidence:</p> <p>Mystery Science Assessments https://mysteryscience.com/biodiversity/animal-biod</p>

In this activity, students work in pairs and play a card sorting game to apply their knowledge on traits. Students will discuss which plants are related to one another by observing and explaining the traits they acquire. Students will also explore how human beings have modified plants based on our knowledge of how plants inherit their traits.

<https://mysteryscience.com/flowers/mystery-4/fruiting-reproduction/92?r=47229275>

3-LS1-1, 3-LS4-2

Life Cycle Summative Assessment

Students will create several animals and describe their characteristics, response to the environment, and group behaviors. Students will label the life cycle of each animal. Students can create this on google slides, construction paper, file or folder, or another way of their choosing.

<https://betterlesson.com/lesson/631291/create-an-animal-exploring-ideas>

Possible Assessment Rubric

Student Self-Reflection Rubric

<https://www.exemplars.com/assets/files/seed.pdf>

[iversity/assessments](#)

<https://mysteryscience.com/plants/plant-adaptations/assessments>

Possible Assessments

[Free Internet Resource including Slides presentation and test](#)

Designer Dogs

In this visual activity, students are shown pairs of adult dogs and three potential puppies. They study the physical traits of the dogs and look for the puppy that shares these traits.

<https://mysteryscience.com/animals/mystery-4/heredity-variation-selection/30?r=47229275>

Stage 3 – Learning Plan and Resources

Suggested Resources for Planning:

Mystery Science - www.mysteryscience.com

Newsela - www.newsela.com

A-Z-animals.com - Animal Research

Tower Garden lessons

1. <https://www.towergarden.com/content/dam/towergarden/resources/lesson-plans/nonfiction-pass-age-G2-3.pdf>
2. <https://www.towergarden.com/content/dam/towergarden/resources/lesson-plans/science-journal-G2-3.pdf>
3. <https://www.towergarden.com/content/dam/towergarden/resources/lesson-plans/writing-prompts-G2-3.pdf>
4. <https://www.towergarden.com/content/dam/towergarden/resources/lesson-plans/grades-2-and-up-plant-stems.pdf>

Learning Activities:

Free Internet Resource (includes lessons, activities, videos):

<http://www.covington.kyschools.us/userfiles/15/My%20Files/3rd%20gr%20add%20chg/3rd%20gr%20Inheritance...traits.pdf?id=5119>

https://betterlesson.com/browse/master_teacher/326834/68215/167874/jennifer-valentine/curriculum

https://betterlesson.com/browse/master_teacher/326834/68215/167316/jennifer-valentine/curriculum

BrainPOP: Plant Life Cycle

<https://jr.brainpop.com/science/plants/plantlifecycle/>

Life Cycles: Video and Games

http://www.sheppardsoftware.com/scienceforkids/life_cycle/movie.htm

http://www.sheppardsoftware.com/scienceforkids/life_cycle/games.htm

Animal Life Cycles

<http://www.kidzone.ws/animals/lifecycle.htm>

Why Do Plants Grow Flowers?

In this Mystery students learn how and why flowers are pollinated. In the activity students create a model of a flower.

<https://mysteryscience.com/flowers/mystery-1/flowering-reproduction/91?r=47229275>

Why Do Plants Give us Fruit?

In this Mystery students learn about why plants grow fruit. In the activity, they practice identifying fruit versus vegetables.

<https://mysteryscience.com/flowers/mystery-2/reproduction/89?r=47229275>

Why Are Some Apples Red and Some Green?

In this Mystery students learn how the food we eat is a result of selection. In the activity students taste different apples and identify the traits human beings have selected for.

<https://mysteryscience.com/flowers/mystery-3/inheritance-traits-selection/90?r=47229275>

Suggested Methods: (The following methods anchor learning with a purpose, mitigating the “why do I need to know this” questions.)

- Phenomena based learning
- Problem Based Learning (PBL)
- Inquiry Based Learning
- Case studies
- Engaging in Argument w/ evidence