THIRD GRADE: REPRODUCTION AND TRAITS

Standards Bundle

Standards are listed within the bundle. Bundles are created with potential instructional use in mind, based upon the potential for related phenomena that can be used throughout a unit.

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. (SEP: 1; DCI: LS1.B; CCC: Patterns) [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-LS3-1. Analyze and interpret data to provide evidence that plants and animals have traits inherited from parents and that variations of these traits exist in a group of similar organisms. (SEP: 4; DCI: LS3.A, LS3.B; CCC: Patterns) [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 and reasoning to support the explanation that traits can be influenced by the environment. (SEP: 6; DCI: LS3.A, LS3.B; CCC: Cause/Effect) [Clarification Statement: Examples of the environment affecting a trait could include normally tall plants grown with insufficient water being stunted, and a pet dog that is given too much food and little exercise may become overweight.]

Content Overview

This section provides a generic overview of the content or disciplinary core ideas as an entry point to the standards.

Life cycles of plants and animals can be compared to identify patterns in common birth, growth, reproduction, and death. In addition, as life cycles are compared the unique nature and characteristics of certain organisms are seen. Characteristics belonging to plants and animals are passed down from parents to offspring and patterns of similarities and differences can be observed. Despite that traits are inherited; these traits can be influenced by the surrounding environment.

Phenomena

Phenomena can be used at varying levels of instruction. One could be used to anchor an entire unit, while another might be more supplemental for anchoring just a unit. Please remember that phenomena should allow students to engage in the SEP and use the CCC/DCI to understand and explain the phenomenon.

- Our dog had five puppies. Three of them have spots just like their mom.
- The patches of petunias look alike but vary in color.
- My cat weighs 13 pounds, but the sister to my cat who lives in a different household only weighs 7 pounds!
- I noticed that the deer are looking very scrawny this fall.
- Plants grow from seeds.
- Garden plants eventually die.
- Caterpillars will turn into butterflies.
- Mutts look like a cross between two types of dogs.
- Purebred animals have similar-looking parents.
- My labradoodle has characteristics of both its parents (Labrador and poodle).

Storyline

This section aims to decode not only the DCI connections but also the SEP and CCC in a detailed account of how they possibly fit together in a progression for student learning, including both rationale and context for the bundle.

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
Analyzing and Interpreting Data ● Analyze and interpret data to make sense of phenomena using logical reasoning. **Constructing Explanations and Designing Solutions** ● Use evidence (e.g., observations, patterns) to support an explanation.	**LS3.A: Inheritance of Traits** ● Many characteristics of organisms are inherited from their parents. ● Other characteristics result from individuals' interactions with the environment, which can range from diet to learning. Many characteristics involve both inheritance and environment.	**Patterns** ● Patterns of change can be used to make predictions. ● Similarities and differences in patterns can be used to sort and classify natural phenomena. **Cause and Effect** ● Cause and effect relationships are routinely identified and used to explain change.

Developing and Using Models ● Develop models to describe phenomena.	**LS3.B: Variation of Traits** ● Different organisms vary in how they look and function because they have different inherited information. ● The environment also affects the traits that an organism develops. **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.	

Students see patterns in the traits of different organisms. In species and groups, we see animals with similar traits. Although they have similar traits, we also see slight differences in the color, shape, size, and function of these animals. Students recognize that these different similarities are ways for animals and plants to adapt to their surroundings in their environment.

Students argue that plant and animal life cycles are unique. Different organisms have different beginnings (e.g., plants start as a seed, some animals are hatched, and others are born from a mother). By using comparing and contrasting students should understand that even though the life cycles for each living thing are different, they also have many commonalities: birth, growth, reproduction, and death.

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Formative Assessment

Formative assessment is crucial because all learners benefit from timely and focused feedback from others. It promotes self-reflection, self-explanation, and social learning. It can also make learning more relevant. Each of the questions below might be used throughout the formative assessment process. Specific prompts may focus on individual practices, core ideas, or crosscutting concepts, but, together, the components need to support inferences about students' three-dimensional science learning as described in a given bundle, standard or lesson-level performance expectation.

SEP Analyzing and Interpreting Data

- After identifying patterns of inherited traits, explain how organisms inherit characteristics from their parents.

SEP Constructing Explanations and Designing Solutions.

- Explain why reproduction is essential for the continued existence of every kind of organism.

SEP Developing and Using Models

- Create a model to show the stages of an organism's life cycle. (e.g., butterfly or plant)

CCC Cause and Effect

- What are some factors that cause organisms to change their interactions within the environment?
- How can a trait be influenced by its environment?

CCC Patterns

- What patterns can be identified in the life cycles of a particular group of animals?
- What patterns can be identified in the life cycles of a particular group of plants?
- Using evidence, explain how organisms of the same family can vary in appearance.
- By observing pictures identify the similarities between organisms and their parents.

Performance Outcomes

These are statements of how students use knowledge and are similar to the standards in how they blend DCI, SEP, and CCC, but at a smaller grain size. These are potential outcomes for instruction as it plays out in lessons and activities in the classroom. It is important to also think of these as smaller outcomes that build toward the larger goal of mastering the standards.

- **Develop models** to describe the life cycles of animals and plants and by *recognizing patterns,* identify the stages of those life cycles.
- **Compare and contrast** the life cycles of animals and plants by recognizing their *similarities and differences.*
- **Utilize observations** to *identify similarities and patterns* that exist between organisms and their parents.
- **Analyze and interpret data** to show that organisms inherit characteristics from their parents by identifying *patterns* of inheritance.
- **Use evidence to support the claim** that the environment *can influence* the traits of plants and animals.