1st Grade: Heredity

Standards Bundle

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

1-LS1-2 Read texts and use media to determine patterns in behavior of parents and offspring that help offspring survive. (SEP: 8; DCI: LS1.B; CCC: Patterns)
[Clarification Statement: Examples of patterns of behaviors could include the signals that offspring make (such as crying, cheeping, and other vocalizations)and the responses of the parents (such as feeding, comforting, and protecting the offspring).
1-LS3-1 Construct an evidence-based account that young plants and animals are like, but not exactly like, their parents. (SEP: 6; DCI: LS3.A, LS3.B; CCC: Patterns)
[Clarification Statement: Examples of patterns could include features plants or animals share. Examples of observations could include leaves from the same kind of plant are the same shape but can differ in size; and, a particular breed of dog looks like its parents but is not exactly the same.] [Assessment Boundary: Assessment does not include inheritance or animals that undergo metamorphosis or hybrids.]

Content Overview

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

Animals and plants have young. The adult plants and animals can have certain behaviors that help their offspring to survive. Plants' and animals' young are like their parents, but not exactly the same. Each offspring can have specific things that are like their parents but can still have major differences from their parents.

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.

- A yellow lab has a litter of yellow, chocolate, and black lab puppies.
- There are more black moths in a forest than white moths.
- A brother and sister are twins, but they look different.
- People say I have my mom's eyes but I have brown hair like my dad.
- Adult plants and animals can have young.
- Goslings are nestled underneath a parent's wing.
- Babies cry when they are hungry.

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
Constructing Explanations and Designing Solutions ● Make observations (firsthand or from media) to construct an evidence-based account for natural phenomena. **Obtaining, Evaluating, and Communicating Information** ● Read grade-appropriate texts and use media to obtain scientific information to determine patterns in the natural world.	**LS3.A: Inheritance of Traits** • Young animals are very much, but not exactly like, their parents. Plants also are very much, but not exactly, like their parents. **LS3.B: Variation of Traits** • Individuals of the same kind of plant or animal are recognizable as similar but can also vary in many ways. **LS1.B: Growth and Development of Organisms** ● Adult plants and animals can have young. In many kinds of animals, parents and the offspring themselves engage in behaviors that help the offspring to survive.	**Patterns** ● Patterns in the natural and human designed world can be observed, used to describe phenomena, and used as evidence.

Plants and animals produce offspring. These offspring can have traits similar to their parents' traits, but also have characteristics that can vary giving them their unique aspects. Students should be able to make observations that all plants and animals of the same type are recognizable because they have similar characteristics. They will need opportunities to observe a variety of plants and animals in order to look for similarities and differences in their features. For example, when comparing the shape, size, color, or number of leaves on plants, students begin to notice that plants of the same kind have leaves that are the same shape and color, but the leaves of one plant may differ from another in size or number. When comparing body coverings; number, size, and type of external features (legs, tail, eyes, mouth parts); body size, body coloring, or eye color of animals, students learn that animals of the same kind have the same

type of body covering and the same number and types of external features, but the size of the body, the size of external features, body color, and/or eye color of individuals might differ. Making observations like these helps students recognize that young plants and animals look very much, but not exactly, like their parents, and that even though individuals of the same kind of plant or animal are recognizable as similar, they can also vary in many ways.

While both plants and animals can have young, it is the parents of young animals who might engage in behaviors that help their young survive. Some examples of these patterns of behaviors could include the signals that offspring make, such as crying, cheeping, and other vocalizations, and the responses of parents, such as feeding, comforting, and protecting their young. Students should have opportunities to research using age appropriate text and media to help them identify some of the patterns of characteristics and behaviors parents and offspring engage in to help them survive. Students should be able to use their observations to construct explanations about how these patterns of behavior help organisms survive. At this age, students need concrete examples of why things are happening around them. Researching behaviors and traits will allow students to be able to make the observations of the patterns that exist in plant and animal offspring. When teaching these standards, if students are not making noticeable observations of the patterns, guide them to see the patterns to get a deeper understanding of the concept.

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.

Resources to inform your formative assessment.

http://stemteachingtools.org/brief/30
http://stemteachingtools.org/brief/41
http://stemteachingtools.org/pd/sessionb

SEP Constructing Explanations and Designing Solutions

- Construct an explanation why a black lab has black, chocolate, and yellow lab puppies

SEP Obtaining, Evaluating, and Communicating Information

- Construct an explanation why there are more black moths in forests than white moths.
- Use information from more than one relevant text to find the similarities of a chosen plant or animal.

CCC Patterns

- What are some similarities and differences between a cat and a dog?
- What are some similarities and differences between a maple tree and an evergreen tree?

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.

- **Evaluate information based on evidence** that inheritance *patterns* are determined by parents.
- **Construct an explanation based on evidence** that the *patterns of* growth and development of organisms are determined by *behavior.*
- **Communicate information** that describe the variation of trait *patterns* can be recognizable and vary from organism to organism.