

Unit Overview	
Content Area: Life Science	
Unit Title: Parents and Offspring/ Inspired By Nature	Unit: 2
Target Course/Grade Level: 1	Timeline: 29 Days
<p>Unit Summary: In this unit of study, students develop an understanding of how plants and animals use their external parts to help them survive, grow, and meet their needs, as well as how the behaviors of parents and offspring help offspring survive. The understanding that young plants and animals are like, but not exactly the same as their parents is developed. The crosscutting concept of patterns is called out as an organizing concept for the disciplinary core ideas. Students are expected to demonstrate grade-appropriate proficiency in obtaining, evaluating, and communicating information and constructing explanations. Students are also expected to use these practices to demonstrate understanding of the core ideas.</p> <p>This unit is based on 1-LS3-1 and 1-LS1-2.</p> <p>In this unit of study, students develop an understanding of how plants and animals use their parts to help them survive, grow, and meet their needs. Students also need opportunities to develop possible solutions. As students develop possible solutions, one challenge will be to keep them from immediately implementing the first solution they think of and to instead think through the problem carefully before acting. Having students sketch their ideas or make a physical model is a good way to engage them in shaping their ideas to meet the requirements of the problem. The crosscutting concept of structure and function is called out as an organizing concept for the disciplinary core ideas. Students are expected to demonstrate grade-appropriate proficiency in constructing explanations and designing solutions, and in developing and using models. Students are expected to use these practices to demonstrate an understanding of the core ideas.</p> <p>This unit is based on 1-LS1-1 and K-2-ETS1-2.</p>	
Learning Targets	
NJSLS-Science/Technology	

<p>1-LS3-1</p> <p>1-LS1-2</p>	<p>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. <i>[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.]</i> <i>[Assessment Boundary: Assessment does not include genetic mechanisms of inheritance and prediction of traits. Assessment is limited to non-human examples.]</i></p> <p>Read texts and use media to determine patterns in behavior of parents and offspring that help offspring survive. <i>[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).]</i></p>
<p>1-LS1-1</p>	<p>Use materials to design a solution to a human problem by mimicking how plants and/or animals use their external parts to help them survive, grow, and meet their needs.* <i>[Clarification Statement: Examples of human problems that can be solved by mimicking plant or animal solutions could include designing clothing or equipment to protect bicyclists by mimicking turtle shells, acorn shells, and animal scales; stabilizing structures by mimicking animal tails and roots on plants; keeping out intruders by mimicking thorns on branches and animal quills; and, detecting intruders by mimicking eyes and ears.]</i></p>
<p>K-2-ETS1-2</p>	<p>Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem.</p>
<p>8.1.2.E.1</p>	<p>Use digital tools and online resources to explore a problem or issue.</p>
<p>8.2.2.A.1</p>	<p>Define products produced as a result of technology or of nature.</p>
<p>8.2.2.A.3</p>	<p>Identify a system and the components that work together to accomplish its purpose.</p>
<p>8.2.2.A.2</p>	<p>Describe how designed products and systems are useful at school, home, and work.</p>
<p>8.2.2.A.4</p>	<p>Choose a product to make and plans the tools and materials needed.</p>
<p>8.2.2.A.5</p>	<p>Collaborate to design a solution to a problem affecting the community.</p>
<p>8.2.2.B. 1</p>	<p>Identify how technology impacts or improves life.</p>
<p>8.2.2. B.3</p>	<p>Identify products or systems that are designed to meet human needs.</p>

8.2.2.B. 4	Identify how the ways people live and work has changed because of technology.
8.2.2.C.1	Brainstorm ideas on how to solve a problem or build a product.
8.2.2.C.2	Create a drawing of a product or device that communicates its function to peers and discuss.
8.2.2.C.3	Explain why we need to make new products.
8.2.2.D.1	Collaborate and apply a design process to solve a simple problem from everyday experiences.
8.2.2.D.5	Identify how using a tool (such as a bucket or wagon) aids in reducing work.

Disciplinary Core Ideas

LS3.A: Inheritance of Traits

- Many characteristics of organisms are inherited from their parents. (3-LS3-1)

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. (1-LS1-2)

LS1.A: Structure and Function

- All organisms have external parts. Different animals use their body parts in different ways to see, hear, grasp objects, protect themselves, move from place to place, and seek, find, and take in food, water and air. Plants also have different parts (roots, stems, leaves, flowers, fruits) that help them survive and grow. (1-LS1-1)

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. (1-LS1-2)

LS1.D: Information Processing

- Animals have body parts that capture and convey different kinds of information needed for growth and survival. Animals respond to these inputs with behaviors that help them survive. Plants also respond to some external inputs. (1-LS1-1)

ETS1.B: Developing Possible Solutions

- Designs can be conveyed through sketches, drawings, or physical models. These representations are useful in communicating ideas for a problem's solutions to other people. (K-2-ETS1-2)

Science and Engineering Practices

Analyzing and Interpreting Data

- Analyze and interpret data to make sense of phenomena using logical reasoning. (3-LS3-1)

Obtaining, Evaluating, and Communicating Information

- Read grade-appropriate texts and use media to obtain scientific information to determine patterns in the natural world. (1-LS1-2)

Analyzing and Interpreting Data

- Analyze and interpret data to make sense of phenomena using logical reasoning. (3-LS3-1)

Constructing Explanations and Designing Solutions

- Use materials to design a device that solves a specific problem or a solution to a specific problem. (1-LS1-1)

Developing and Using Models

- Develop a simple model based on evidence to represent a proposed object or tool. (K-2-ETS1-2)

NJSLS Connections

Primary Interdisciplinary Connections:

English Language Arts/Literacy:

Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers. (3-LS3-1) **RI.3.1**

Determine the main idea of a text; recount the key details and explain how they support the main idea. (3-LS3-1) **RI.3.2**

Describe the relationship between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text, using language that pertains to time, sequence, and cause/effect. (3-LS3-1) **RI.3.3**

Participate in shared research and writing projects (e.g., explore a number of “how-to” books on a given topic and use them to write a sequence of instructions). (1-LS1-1) **W.1.7**

Write informative/explanatory texts to examine a topic and convey ideas and information clearly. (3-LS3-1) **SL.3.4**

Report on a topic or text, tell a story, or recount an experience with appropriate facts and relevant, descriptive details, speaking clearly at an understandable pace. (3-LS3-1) **W.3.2**

Mathematics:

Reason abstractly and quantitatively. (3-LS3-1) **MP.2**

Model with mathematics (3-LS3-1) **MP.4**

Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units—whole numbers, halves, or quarters. (3-LS3-1) **3.MD.B.4**

English Language Arts/Literacy:

Participate in shared research and writing projects (e.g., explore a number of “how-to” books on a given topic and use them to write a sequence of instructions). (1-LS1-1)

Create audio recordings of stories or poems; add drawings or other visual displays to stories or recounts of experiences when appropriate to clarify ideas, thoughts, and feelings. (K-2-ETS1-2) **SL.2.5**

Mathematics: N/A

Unit Essential Questions

1. *How are young plants and animals alike and different from their parents?*
2. *What types (patterns) of behavior can be observed among parents that help offspring survive?*
3. *How can humans mimic how plants and animals use their external parts to help them survive and grow?*

Unit Understandings

- Patterns in the natural world can be observed, used to describe phenomena, and used as evidence.
- Individuals of the same kind of plant or animal are recognizable as similar but can also vary in many ways.
- Young animals are very much, but not exactly, like their parents. Plants also are very much, but not exactly, like their parents.
- Scientists look for patterns and order when making observations about the world.
- Patterns in the natural world can be observed, used to describe phenomena, and used as evidence.
- Adult plants and animals can have young.
- In many kinds of animals, parents and the offspring themselves engage in behaviors that help the offspring survive.
- Every human-made product is designed by applying some knowledge of the natural world and is built using materials derived from the natural world.
- The shape and stability of structures of natural and designed objects are related to their function(s).
- All organisms have external parts. Different animals use their body parts in different ways to see, hear, grasp objects, protect themselves, move from place to place, and seek, find, and take in food, water, and air. Plants also have different parts (roots, stems, leaves, flowers, fruits) that help them survive and grow.
- Animals have body parts that capture and convey different kinds of information needed for growth and survival. Animals respond to these inputs with behaviors that help them survive. Plants also respond to some external inputs.
- Designs can be conveyed through sketches, drawings, or physical models. These representations are useful in communicating ideas for a problem’s solutions to other people.

Unit Learning Targets (Outcomes) – Formative Assessment

Students who understand the concepts are able to ...

- Observe and use patterns in the natural world as evidence and to describe phenomena.
- Make observations (firsthand or from media) to construct an evidence-based account for natural phenomena.
- Make observations to construct an evidence-based account that young plants and animals are like, but not exactly like, their parents.
 - ✓ Examples of patterns could include features plants or animals share.
 - ✓ Examples of observations could include that leaves from the same kind of plant are the same shape but can differ in size and that a particular breed of puppy looks like its parents but is not exactly the same.

[Note: Assessment does not include inheritance or animals that undergo metamorphosis or hybrids.]

- Observe and use patterns in the natural world as evidence and to describe phenomena.
- Read grade-appropriate texts and use media to obtain scientific information to determine patterns in the natural world.
- Read texts and use media to determine patterns in behavior of parents and offspring that help offspring survive. Examples of patterns of behaviors could include:
 - ✓ The signals that offspring make, such as crying, chirping, and other vocalizations.
 - ✓ The responses of the parents, such as feeding, comforting, and protecting the offspring.

- Observe and describe how the shape and stability of structures of natural and designed objects are related to their functions.
- Use materials to design a device that solves a specific problem or [design] a solution to a specific problem.
- Use materials to design a solution to a human problem that mimics how plants and/or animals use their external parts to help them survive, grow, and meet their needs: Examples of human problems that can be solved by mimicking plant or animal solutions could include:
 - ✓ Designing clothing or equipment to protect bicyclists by mimicking turtle shells, acorn shells, and animal scales.
 - ✓ Stabilizing structures by mimicking animal tails and roots on plants.
 - ✓ Keeping out intruders by mimicking thorns on branches and animal quills.
 - ✓ Detecting intruders by mimicking eyes and ears.
- Develop a simple model based on evidence to represent a proposed object or tool.
- Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem.

Cross Cutting Concepts:

Patterns

- Similarities and differences in patterns can be used to sort and classify natural phenomena. (3-LS3-1)

- Patterns in the natural and human designed world can be observed, used to describe phenomena, and used as evidence. (1-LS1-2)

Connections to Nature of Science

Scientific Knowledge is Based on Empirical Evidence

- Scientists look for patterns and order when making observations about the world. (1-LS1-2)

Patterns

- Patterns in the natural and human designed world can be observed, used to describe phenomena, and used as evidence. (1-LS1-2)

Structure and Function

- The shape and stability of structures of natural and designed objects are related to their function(s). (1-LS1-1)
- The shape and stability of structures of natural and designed objects are related to their function(s). (K-2-ETS1-2)

Connections to Engineering, Technology, and Applications of Science

Influence of Science, Engineering and Technology on Society and the Natural World

- Every human-made product is designed by applying some knowledge of the natural world and is built using materials derived from the natural world. (1-LS1-1)

Integration of Technology: Web-based textbook, interactive whiteboard, interactive texts, videos, digital board builder

Technology Resources:

Opportunities for Differentiation: Differentiation and support tips, which includes suggestions for ELL, struggling students, and accelerated students, are available below the instructional practice section of each model lesson.

Teacher Notes:

Career Ready Practices: *In this unit the following career ready practices are addressed*

- CRP1: Act as a reasonable and contributing citizen and employee
- CRP2: Apply appropriate academic and technical skills
- CRP3: Attend to personal health and financial well-being
- CRP4: Communicate clearly and effectively and with reason
- CRP5: Consider the environmental, social and economic impacts of decisions
- CRP6: Demonstrate creativity and innovation
- CRP7: Employ valid and reliable research strategies
- CRP8: Utilize critical thinking to make sense of problems and persevere in solving them
- CRP9: Model integrity, ethical leadership and effective management
- CRP10: Plan education and career paths aligned to personal goals
- CRP11: Use technology to enhance productivity
- CRP12: Work productively in teams while using cultural global competence

Prior Learning-

- This is the first formal opportunity for students to engage with the disciplinary core ideas.

Evidence of Learning

Summative Assessment

Parents and Offspring

1. Students will create life cycle plates to show the different stages of development for a human and various animals. Students should be able to identify each stage and how they interact with each other in their environment. Teacher may use a written rubric to evaluate students' understanding and learning. (pg 41)
2. Select a student to role play a reporter for a television or radio station, WINT (winter). The reporter interviews other students who play the roles of different animals and tell about their specific winter behaviors, including why they need to engage in that behavior, what they do to get ready for that behavior, and what they actually do during the winter. (pg. 53)

Inspired by Nature

1. As a final product to this unit, Students will brainstorm, design and create a product that will solve a human "problem" using design inspired by nature. (pg. 99)
2. Teacher will also observe engagement of students during lessons, assess the level of completion of activity sheets and observe the intermediate steps and recording of ideas during the design process.
3. Teacher may use a written rubric to evaluate students' understanding and learning. (pg 84)

Equipment needed: Whiteboard, laptops, headphones, and hands-on materials for lessons

Teacher Instructional Resources (Hyperlinks):

Chip Off the Old Block: In this lesson students compare adult plants with young plants and then match pictures of adult animals with their young. They then are asked to identify specific physical traits of plants and animals that can be used to identify them. Note: The Parent/Offspring photo collection on page three incorrectly states the offspring of a horse is a pony.

Eat Like a Bird! January: This lesson and activity is one of several lessons about birds. In this lesson, students learn that bird beaks come in many different sizes and shapes. Each beak has a specific shape and function to help the bird to get and eat food.

Why So Yummy? In this lesson students will investigate how fruits help some plants survive. The background information is important to the overall goals of this lesson. It states, "fruit-bearing plants can be distinguished from other plants, because they contain a reproductive structure that develops into an edible fruit. This reproductive structure is the shelter that protects the seeds until they are mature. This is important, because seeds are not distributed to the earth for germination until they are ripe." The teacher will need to purchase some fruits ahead of time for this lesson. Identifying a variety of fruits and especially fruits children might have less experience with will enhance the experience.

Modifications for ELL's, Special Education, 504, and Gifted and Talented Students:

(Note: Teachers identify the modifications that they will use in the unit. See NGSS Appendix D: [All Standards, All Students/Case Studies](#) for vignettes and explanations of the modifications.)

- Structure lessons around questions that are authentic, relate to students' interests, social/family background and knowledge of their community.
- Provide students with multiple choices for how they can represent their understandings (e.g. multisensory techniques-auditory/visual aids; pictures, illustrations, graphs, charts, data tables, multimedia, modeling).
- Provide opportunities for students to connect with people of similar backgrounds (e.g. conversations via digital tool such as SKYPE, experts from the community helping with a project, journal articles, and biographies).
- Provide multiple grouping opportunities for students to share their ideas and to encourage work among various backgrounds and cultures (e.g. multiple representation and multimodal experiences).
- Engage students with a variety of Science and Engineering practices to provide students with multiple entry points and multiple ways to demonstrate their understandings.
- Use project-based science learning to connect science with observable phenomena.
- Structure the learning around explaining or solving a social or community-based issue.
- Provide ELL students with multiple literacy strategies.
- Collaborate with after-school programs or clubs to extend learning opportunities.
- Restructure lesson using UDL principles
(http://www.cast.org/our-work/about-udl.html#.VXmoXcfD_UA)

<u>ACTIVITIES</u>	<u>MATERIALS</u>
<p>Grade 1 Knowing Science Physical Science Techbook Course: Life Science Unit: Parents and Offspring Concept: The Circle of Life-Animals Life Cycles</p>	
<p><u>Session 1: (Approx. 2 Day)</u> Lesson Question: What are generations? Read <u>Me and My Family Tree</u> Discuss generations Do Activity Sheet 1: Human Life Cycle</p>	<ul style="list-style-type: none"> ● Book: <u>Me and My Family Tree</u> ● Construction Paper ● Family Tree Copies ● Copies of generations worksheet ● Activity Sheet 1: Human Life Cycle

<p>D2-make family tree craft</p>	
<p><u>Session 2: (Approx. 2 Day)</u> Lesson Question: What are the stages in a bird's (chicken's) life cycle? D1-Begin with T chart of class discussions of ways animals are born. <i>Live birth/eggs</i> Read <u>A Chicken's Life Cycle</u> book- do us to label stages D2-Craft</p>	<ul style="list-style-type: none"> ● Activity Sheet 2: Chicken Life Cycle ● Life Cycles Kit ● General craft supplies (crayons or colored pencils, glue)
<p><u>Session 3: (Approx. 2 Day)</u> Lesson Question: What are the stages in a butterfly's life cycle? D 1- Read <u>A Butterfly's Life</u> cycle book- label stages worksheet D2 Complete butterfly life cycle craft</p>	<ul style="list-style-type: none"> ● Activity Sheet 3: Butterfly Life Cycle ● Life Cycles Kit ● Butterfly Book ● Brainpopjr Video on butterflies ● Craft materials
<p><u>Session 4: (Approx. 2 Day)</u> Lesson Question: What are the stages in a frog's life cycle? D 1- Read <u>A Frog's life cycle</u> book and show brainpopjr video on frog life cycle. D 2- Complete frog life cycle craft</p>	<ul style="list-style-type: none"> ● Activity Sheet 3: Frog Life Cycle ● Life Cycles Kit ● Frog Book ● Brainpopjr Video on frog
<p><u>Session 5: (Approx. 1 Day)</u> Lesson Question: What have we learned about life cycles? Review chart on what we know about lifecycles Read any other lifecycle book if you want to make connections</p>	<ul style="list-style-type: none"> ● Paper Plate life cycles from previous sessions. ● Student copies of Activity Sheets 2, 3, 4, saved from previous sessions. ● http://www.softschools.com/science/animals
<p>1.2 Getting Together-Animals that Live in Groups</p>	
<p><u>Session 1: (Approx. 1 Day)</u> Lesson Question: What is the purpose of a human family?</p>	<ul style="list-style-type: none"> ● Animal Families Chart ● Activity Sheet 1: My Family Cares for Me

<p>Add Human to the animals families graphic organizers. List ideas about how a family cares for their children. Add to Animal Families Chart.</p>	
<p><u>Session 2: (Approx. 1 Day)</u> Lesson Question: How is a herd of elephants like a family? *Read <u>Animal Families: Life in an Elephant Herd</u> *Together chart how elephants are like an elephant *Walk like an elephant activity</p>	<ul style="list-style-type: none"> ● Elephant print book
<p><u>Session 3: (Approx. 1 Day)</u> Lesson Question: How is a pack of wolves like a family? Read <u>Animal Families: Life in a Wolf Pack</u> Chart how wolves are like a family * Alpha wolves activity with</p>	<ul style="list-style-type: none"> ● Wolf print book
<p><u>Session 4: (Approx. 2 Day)</u> Lesson Question: How is a school of dolphins like a family? Read Animal <u>Families: Life in a Dolphin Pod</u> Create a “safety in numbers” demonstration using plastic container with water, green food coloring and sequins. Complete Dolphin pod experiment</p>	<ul style="list-style-type: none"> ● Dolphin print book ● Water ● KS School of Dolphin Kit
<p><u>Session 5: (Approx. 1 Day)</u> Lesson Question: How is a colony of bees like a family? Read Animal Families: Life in a Honeybee Colony Chart *Have students act like a honey bee and dance when they find food.</p>	
<p><u>Session 6: (Approx. 1 Day)</u> Lesson Question: What animal family would you like to be a part of? Review the different animal groups and allow students to pick which group they would like to belong to. Complete ws and have students share, if time allows.</p>	<ul style="list-style-type: none"> ● Review chart ● w/s of their favorite animal group

<p>1.3- Ready? Set? Snow! Winter Survival Behaviors</p>	
<p><u>Session 1: (Approx. 1 Day)</u> Lesson Question: How do people get ready for winter? Read book-<u>All About Winter Weather</u> How do you get ready for winter? w/s</p>	<ul style="list-style-type: none"> • Book: <u>All About Winter Weather</u> • <i>How do you get ready for winter? w/s</i>
<p><u>Session 2: (Approx. 1 Day)</u> Lesson Question: Why do animals migrate? Read book-<u>Animal Migration</u> Video Complete page in winter behaviors book</p>	<ul style="list-style-type: none"> • Brainpop Video • Book • http://pbskids.org/catinthecat/games/migration-adventure
<p><u>Session 3: (Approx. 1 Day)</u> Lesson Question: What happens when animals hibernate? Read book- <u>Animal Hibernation</u> Show brainpopjr video on hibernation. Complete page in winter behaviors book</p>	<ul style="list-style-type: none"> • Brainpop Video • Book: <u>Animal Hibernation</u> • Activity Sheet 2: Winter Behavior Images
<p><u>Session 4: (Approx. 2 Day)</u> Lesson Question: What is the difference between winter sleep and hibernation? Read book- <u>What Do Critters Do in Winter?</u> sort pictures Complete page in winter behaviors book</p>	<ul style="list-style-type: none"> • Winter behavior graphic organizer • <u>Winter Behaviors</u> booklet • Activity Sheet 2: Winter Behavior Images
<p><u>Session 5: (Approx. 1 Day)</u> Lesson Question: Which animals remain active during the winter? Read the section on Animals Active During the Winter from the <u>What Do We Do in Winter?</u> Add the name of animals that stay active to the graphic organizer. Finish sort</p>	<ul style="list-style-type: none"> • Do pocket chart sort
<p>Concept: Inspired by Nature</p>	

<p><u>Session 1: (Approx. 1 Day)</u> Lesson Question: How does nature help humans solve problems?</p> <p>Introduce word biomimicry- Read book.-How and <u>Why Do People Copy Animals?</u> Pass out sets of cards have pairs match</p>	<ul style="list-style-type: none"> ● Activity Sheet 1: Nature-Inspired Products match cards ● Biomimicry Kit
<p><u>Session 2: (Approx. 1 Day)</u> Lesson Question: How do water striders walk on water?</p> <p>Start session by asking students to think of some things that float on top of the water. Ask if they have ever heard of a water strider. Complete water strider activity using paper clip, flat fork and bowl of water. Allow each student to try the experiment and then discuss.</p>	<ul style="list-style-type: none"> ● Walking on Water Kit ● Activity Sheet 2: Walking on Water
<p><u>Session 3: (Approx. 1 Day)</u> Lesson Question: How can nature give humans ideas?</p> <p>In this lesson students have the opportunity to become design engineers. Review that “Biomimicry” means “to copy nature”. Brainstorm ideas with teacher support.</p> <p>Use animal inspired picture cards to show kid friendly examples.</p>	<ul style="list-style-type: none"> ● Activity Sheet 3: Brainstorming Ideas ● Activity Sheet 4: Ideas from Nature ● Animals inspired picture cards. (from google drive)
<p><u>Session 4: (Approx. 1 Day)</u> Lesson Question: Let’s make our own biomimicry design?</p> <p>Students will work with their science groups to brainstorm, design and create a product that will solve a human “problem” using a designed inspired by nature. Use will use various art supplies to create their idea.</p>	<ul style="list-style-type: none"> ● Biomimicry Engineering Kit ● Various art supplies from classroom or home ● Glue ● Activity Sheet 4: Ideas from Nature ● Activity Sheet 5: Nature Design Task