



Grade 1 Life Science/ELD:

Parts, Patterns and Solutions

[Spanish link](#)

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NOTES:

Science Notebooks will be distributed to schools by the Instructional Resource Center. [Science Notebook link here](#) in case you need extra copies.

- [Sample letter linked here](#) for families to collect materials for engineering lessons. Recommended to send home at the beginning of the unit.
- Students use Epic! (online) in this unit. Need to have account for Epic? get one here: <https://www.getepic.com/educators>. Find out more information on P. 7 of this guide.
- Kit packing/materials list is [linked here](#).

If you have any problem with the content of your kits, please contact sciencekits@pps.net.

Up to 2 hours of paid time are available to complete the [asynchronous PD](#) for PPS Gr. 1 teachers (2022-23 school year)

Find online units and revisions at the [K-5 Academics website](#). Use the drop down menus to navigate to your grade level and unit.

Ask questions, give [feedback here](#).

Unit Overview			
<p>Essential questions: What patterns of structure and behaviors help animals survive? How can we use these patterns to help us solve human problems?</p>			
<p>Enduring Understandings</p> <ul style="list-style-type: none"> Plants and animals have offspring. Offspring are similar, but not identical, to their parents. Plants and animals have features and behaviors that help them survive. Nature can inspire engineering solutions. 			
<p>Link to Translated Materials: (Spanish)</p>			
Lesson Link	Slideshow Link	Lesson Overview	Lesson Guiding Question
<p>I. Patterns in animal behavior</p>			
<p>Lesson 1 Phenomenon</p>	<p>Slideshow 1</p>	<p>(Pre-assessment). Students ask questions about the phenomenon of baby ducks following a dog.</p>	<p>What is going on between the baby ducks and the dog?</p>
<p>Lesson 2 Animal Dads</p>	<p>Slideshow 2</p>	<p>Students listen to and review animal behaviors from a book about how animal dads help their babies survive.</p>	<p>How do some animal dads help their babies survive?</p>
<p>Lesson 3 Animal Moms</p>	<p>Slideshow 3</p>	<p>Students read/listen to books to find evidence of animal mom behavior to help their babies survive.</p>	<p>How do some animal moms help animal babies survive?</p>
<p>Lesson 4 Baby Animals</p>	<p>Slideshow 4</p>	<p>Students read/listen to books to find evidence of animal baby behavior to help themselves survive.</p>	<p>How do some baby animals help themselves survive?</p>
<p>Lesson 5 Return to Phenomenon</p>	<p>Slideshow 5</p>	<p>Students use the information they have gathered to explain the unit phenomenon.</p>	<p>Why were the baby ducks following the dog?</p>

II. Patterns in animal body parts			
Lesson 6 Duck, Duck, Dog, Part 1	Slideshow 6	<u>Day 1:</u> Students identify animal body parts and use evidence to describe how animals are similar and different.	How do we tell animals apart?
Lesson 7 Duck, Duck, Dog, Part 2	Slideshow 7	<u>Day 2:</u> Students sort animal picture cards and describe why they belong in certain groups.	
Lesson 8 Baby and Parent Patterns	Slideshow 8	Students observe pictures of animal parents and babies and using language to compare and contrast physical features. They look at class data to draw conclusions.	How does a baby animal compare to its parent?
Lesson 9 Who's my Parent?	Slideshow 9	(Summative assessment for this part of the unit) Students match photos of baby and adult animals and make a claim with evidence to show why the parent and baby are matched together.	How can we use patterns to match animal babies and parents?
III. Animal body parts & Biomimicry			
Lesson 10 Guessing Game and Carousel	Slideshow 10	Students activate background knowledge about how animals use their body parts to survive.	How do animals use their body parts to survive ?
Lesson 11 Bird Beak Investigation	Slideshow 11	Students carry out an investigation to determine the relationship between the shape of different bird beaks and the food each bird eats.	How do animals use their body parts to get food?
Lesson 12 What Do You Do With A Tail Like This?	Slideshow 12	Students obtain information from a read aloud about how animals use their body parts to survive.	How do animals use their body parts (nose, ears, tails, eyes, mouths, and feet) to survive?

Lesson 13 What Do You Do When Something Wants to Eat You?	Slideshow 13	Students obtain information from a read aloud about how animals use their body parts and behaviors to protect themselves from predators.	How do animals protect themselves from predators?
Lesson 14 Biomimicry Examples	Slideshow 14	Students obtain information about biomimicry, how humans have used ideas from observing animals to solve human problems, in preparation for the engineering design process.	How have humans used ideas from observing animals to solve human problems?
Lesson 15 Solutions Inspired by Animals	Slideshow 15	Students review the engineering design process and think of problems they can solve with biomimicry.	What problems can we solve using animals as inspiration?
Lesson 16 Planning Solutions	Slideshow 16	Students choose their problem to solve, brainstorm possible solutions, and sketch a design solution to build.	How do engineers solve problems?
Lesson 17 Building a Solution, Part 1	Slideshow 17	Students practice agreeing and disagreeing, then plan their design and begin building with a partner.	<i>How can we use materials to build a solution to our problem?</i>
Lesson 18 Building a Solution, Part 2	Slideshow 18	Students practice using the talk moves and then finish building their design with their partner.	<i>How can we use materials to build a solution to our problem?</i>
Lesson 19 Sharing Ideas	Slideshow 19	Students share their design with their classmates.	How can we use other people's ideas to improve our design?
Lesson 20 Improving Solutions	Slideshow 20	Students use ideas from other students' designs to optimize their design.	How can we improve our designs?
Lesson 21 Communicating My Animal-Inspired Solution	Slideshow 21	(Summative assessment) Students communicate their ideas behind their design in speaking and in writing. Emphasis is on making connections between animal body parts and students' design solutions.	How did we use inspiration from a plant or animal part or behavior for our design?

Common Assessment

Student Materials: [Student Worksheet](#) [SeeSaw Version](#)

Teacher Materials:

- [Link to relevant NGSS Performance Expectations and evidence Statements](#)
- [Teacher's Guide](#)
- [Scoring Sample Document](#)

Enduring Understandings and Essential Questions

Gr. 1 Life Science Unit: Parts, Patterns and Solutions

Enduring Understandings

Plants and animals have offspring.

Offspring are similar, but not identical, to their parents.

Plants and animals have features and behaviors that help them survive.

Nature can inspire engineering solutions.

Essential Questions

- What patterns of structure and behavior help plants and animals survive?
 - How do animals help their young grow up?
 - What patterns of body parts do animals have?
 - How do animal body parts help animals survive?
 - How do plant parts help plants survive?
- How can we use these patterns to help us solve human problems?
 - How does nature inspire solutions to human problems?
 - How do engineers solve problems?

NGSS Alignment
Performance Expectations (PE)
1-LS1-1 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.* [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.]
1-LS1-2 Read texts and use media to determine patterns in behavior of parents and offspring that help offspring survive [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 Make observations to construct an evidence-based account that young plants and animals are like, but not exactly like, their parents. [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.]
K-2-ETS1-2 Engineering Design 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.
Science and Engineering Practice (SEP) Focus
Constructing explanations and designing solutions
Obtaining, evaluating, and communicating information
Crosscutting Concepts (CCC) Focus
Patterns
Structure and function

*The performance expectations marked with an asterisk integrate traditional science content with engineering through a Practice or Disciplinary Core Idea.

About the Unit

A Unit in Three Parts:

Students begin this unit by observing a phenomenon video of two baby ducks following a dog. This short video sets the stage for connecting animal behavior to survival (in this case, imprinting of ducklings) in Part I, then looking at patterns of animal body parts (beginning with ducks and dogs) in Part II, and lastly looking at biomimicry (connecting how ducks stay warm and swim to human-design down jackets and swim flippers) in Part III of the unit.

In Part I, students first gather information from texts about behaviors of animal parents and of animal babies that help the animal babies survive and grow up. Students synthesize the information and look for patterns. Next, in Part II, students look at animal body parts and identify patterns that provide evidence of matching baby and parent animals. Finally, for Part III Biomimicry, students learn about various human-engineered designs that were inspired by animals. Students then apply that thinking to solve an engineering design problem that students identify.

Background Information for Disciplinary Core Ideas Addressed in this Unit

In grades K-2, students need to understand that to know that all organisms grow and have offspring. Animal behaviors help animals grow and survive. Certain behaviors also help their offspring survive. Many (but not all) take care of their young, feeding and protecting them as well as teaching them behaviors that help them survive on their own. The emphasis is on observing and describing animal behaviors and on observing and describing animal structures (parts) and how they function to help the animal or its offspring survive.

(Life cycles are addressed in third grade.)

Disciplinary Core Ideas Addressed:

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)

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. (1-LS3-1)

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. (1-LS3-1)

Notes on epic!:

For students to participate in lessons 3 and 4, the teacher needs to:

- Sign up for Epic, a free (for teachers) online library of books, [Epic Sign Up](#)
 - Also see [Epic Getting Started Guide](#) (or see slides 4-10 in [Lesson 3 Slideshow](#))
- Add the [Baby Animals First Grade Life Science](#) collection to your Library
- Assign all students to read the collection. Example: [Seesaw assignment](#) (Thank you to teacher Susan Donohoe.)
- Have devices available for student pairs to read together.

English Language Proficiency Standards at a Glance

Overview of English Language Proficiency Standards in This Unit

There are 10 ELP standards that are consistent K-12. The lessons in this unit address the following.

		Lesson																			
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
E L P S t a n d a r d s	1 – construct meaning	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
	2 – participate	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
	3 – speak and write		x	x	x	x			x	x					x	x	x	x	x	x	x
	4 – construct claims	x				x	x	x	x	x		x									x
	5 – conduct research			x	x																
	6 – analyze claims									x											
	7 – adapt language																				
	8* – determine meaning																				
	9* – create clear speech and text																				
	10* – standard English																				

* ELP standards 8, 9, and 10 ongoing in every lesson

ELP Standards

1 - Construct meaning from oral presentations and literary and informational text through grade-appropriate listening, reading, and viewing

2 - Participate in grade-appropriate oral and written exchanges of information, ideas, and analyses, responding to peer, audience, or reader comments and questions

- 3 - Speak and write about grade-appropriate complex literary and informational texts and topics
- 4 - Construct grade-appropriate oral and written claims and support them with reasoning and evidence
- 5 - Conduct research and evaluate and communicate findings to answer questions or solve problems
- 6 - Analyze and critique the arguments of others orally and in writing
- 7 - Adapt language choices to purpose, task, and audience when speaking and writing
- 8 - Determine the meaning of words and phrases in oral presentations and literary and informational text
- 9 - Create clear and coherent grade-appropriate speech and text
- 10 - Make accurate use of standard English to communicate in grade- appropriate speech and writing

ELP standards and descriptors of proficiency levels available [here](#).

Language Development Routines at a Glance

These interaction routines are intentionally included in every lesson to promote sense-making and language development. You may have similar routines with which your students are familiar. Please feel free to use those. The routines included in this unit are also included in other units at other grade levels. We hope that students will become comfortable with them after some exposure and practice.

In this unit, students will engage in:

[Coding the Text](#)
[Collaborative Poster](#)
[Anticipatory Guide](#)
[Gallery Walk](#)
[Give One, Get One](#)
[Information Gap activities](#)
[Novel Ideas Only](#)
[Numbered Heads Together](#)
[Partner Speaking and Listening Strategies](#)
[Quiz, Quiz, Trade](#)
[Think, Pair, Share/](#)
[Think, Write, Pair, Share](#)
[Three Step Interview](#)

List of [Common Language and Interaction Strategies](#) with instructions

Need more ideas for supporting language learners? Visit the [PPS ESL website](#) and look under *Instructional Strategies*.

Supplemental Resources and Activities

Multnomah County Library has booklists of books selected to support each NGSS-aligned unit. Find the [Grade 1 Life Science Unit booklist here](#).

Online FlexBooks Books: Gr. 1 Science list at <https://www.ck12.org/book/CK-12-First-Grade-Science/>

[Biomimicry Youth Challenge winners](#)

Field trip / Other Resources Opportunities:

The [Lower Columbia River Estuary Partnership](#) provides no-cost field trips and other opportunities, including loans of materials/kits.

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Biomimicry IEA: <https://snapgse.stanford.edu/snap-assessments/instructionally-embedded-assessments>