



### Heredity and Traits of Plants and Animals

#### Essential Questions:

- **EQ1:** How are baby animals and plants similar to their parents?
- **EQ2:** What traits do animals and plants have that help them survive and grow?
- **EQ3:** What can we learn from animals to help us survive and grow?

**Unit Summary:** This unit focuses on how plant and animal traits helps them to survive and grow. It is based on a series of What if you had...? books by Sandra Markle.

- **Lesson 1:** *What is a Scientist?* – Review previous learned vocabulary (from Unit 1) and remind students what their job as a scientist is with a focus on asking questions.
- **Lesson 2:** *Animals and Their Offspring* - Students discover that young animals are very much, but not exactly like their parents.
- **Lesson 3:** *Are You My Mother?* - Students explore traits of different animals for similarities and differences.
- **Lesson 4:** *Plant Traits* – Student guided exploration of a plant’s traits.
- **Lesson 5:** *How Animals Grow and Survive* – Students learn how animals sense and communicate information and respond to inputs to help them survive and grow.
- **Lesson 6:** *How Animals Stay Safe* - Continuation of Lesson #6 goal.
- **Lesson 7:** *Animal Survival Traits* –Students consider how specific animal traits are important for survival.
- **Lesson 8:** *Creating Animal Ears* – Students will explore types of animal ears and explain their function.
- **Lesson 9:** *What Animal Trait Would You Like?* - Students will apply the notion of animal traits to their own life by identifying a trait they’d like to have and explaining how its structure and function would help them survive/grow.

#### Lesson 8 of 9: Creating Animal Ears

<b>Standards</b> 1-LS1. From Molecules to Organisms: Structures and Processes		
<b>Performance Expectations</b> **The lesson outlined in this table is just one step toward reaching the performance expectations listed below** <b>1-LS1-1.</b> 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. <b>1-LS1-2.</b> Read texts and use media to determine patterns in behavior of parents and offspring survive.		
<b>Dimension</b>	<b>Name and NGSS code/citation</b>	<b>Specific Connections to Classroom Activity</b>
<b>Science and Engineering Practices</b>	<b>SEP 6: Constructing Explanations and Designing Solutions</b> <ul style="list-style-type: none"> <li>• Use materials to design a device that solves a specific problem or a solution to a specific problem.</li> </ul> <b>SEP 8: Obtaining, evaluating, and communicating information</b> <ul style="list-style-type: none"> <li>• Read grade-appropriate texts and use media to obtain scientific information to determine patterns in the natural world.</li> </ul>	<b>Constructing Explanations and Designing Solutions:</b> Students create a pair of ears that will help them to carry out a specific action or task. Then, they explain their reasoning behind the connection between the structure and its function.  <b>Obtaining, evaluating, and communicating information:</b> Students learn about animal ears and their function by reading <u>What if I had Animal Ears?</u> as a class. With teacher guidance, they pull out information from the text and the internet to identify how ears can help animals survive/grow. They also review the patterns in animal traits they have gathered throughout the entire unit.



<p><b>Disciplinary Core Ideas</b></p>	<p><b>Structure and Function (LS1.A)</b></p> <ul style="list-style-type: none"> <li>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.</li> </ul>	<p>In all activities, students will be thinking about how external body parts (ears) serve specific purposes. This will be done by looking at pictures of rabbits, doing an internet search, reading a book, summarizing findings in a trait organizer chart, designing a pair of ears, and presenting to their classmates how their animal ears would help them carry out an action/function of their choosing.</p> <p>Students will also review other external parts about which they have learned using their trait organizer chart.</p>
<p><b>Crosscutting Concepts</b></p>	<p><b>CCC 6: Structure and Function</b></p> <ul style="list-style-type: none"> <li>The shape and stability of structures of natural and designed objects are related to their function(s).</li> </ul> <p><b>CCC 1: Patterns</b></p> <ul style="list-style-type: none"> <li>Patterns in the natural world can be observed, used to describe phenomena, and used as evidence.</li> </ul>	<p>In Activity 1, students will be looking at rabbit ears and identifying similarities in their structure as well as making claims as to how the structure might serve a specific function.</p> <p>Activity 2 will begin with several teacher prompted questions to have students consider how rabbit ears will help a rabbit survive. They will also consider whether other animals have similar patterns in ear structure.</p> <p>In Activity 3 and 4, students will be designing a pair of ears with a specific structure for an intentional purpose. Then, they will share their explanations with their classmates.</p>
<p><b>Connections to Engineering, Technology, and Applications of Science:</b></p>		
<p><b>Connecting to the Common Core State Standards</b></p> <p><b>ELA/Literacy –</b></p> <p><b>CCSS.RI.1.1</b> Ask and answer questions about key details in a text.</p> <p><b>CCSS.W.1.7</b> 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).</p> <p><b>CCSS.W.1.8</b> With guidance and support from adults, recall information from experiences or gather information from provided sources to answer a question.</p>		
<p style="text-align: center;"><b>Suggested Procedure</b></p> <p><b>ACTIVITY 1 (targets CCC1, CCC6, LS1.A):</b></p> <p><b>Probe:</b> Divide students into groups of 3 and hand out a set of rabbit pictures to each group. Ask students to look at the pictures and identify what patterns and differences they see in the rabbits’ traits. Display the picture of the jackrabbit in nature. Ask, <b>“What traits do you notice in this rabbit?”</b> Have students think for 20 seconds silently and then take raised hands to share what they notice.</p> <p>Continue discussion by using a Think-Pair-Share format with the following question:  <b>“What might this rabbit be doing? Why do you think that?”</b></p> <p>After students discuss in pairs, ask a few students to share what their partner said. The emphasis should be on using a posture/behavior/trait of the rabbit to explain why they think the rabbit is doing something.</p> <p><b>Possible student responses:</b></p>		



“Looking for food because his eyes are looking out.”  
“Stopping to listen because he is standing up tall.”  
“Frozen because he heard something with his big ears.”

When someone mentions the rabbits’ ears, capitalize on this to move the lesson forward. “Yeah – Some of the rabbits have very large ears! Why do you think they are so big?” Bring students to notion that “A rabbit’s large ears allow it to hear very quiet noises and be alerted if a predator is nearby.” (You can also have them use their hands to create larger ears and see if they hear better)

Exclaim, “We should add this to our Trait Organizer!!!” Have students help you correctly describe the rabbit’s ears (“Rabbits have large, long, and wide ears”) and their function (“The rabbit’s ears help it to hear quiet sounds so it can grow and survive.”) Once added, this is a great opportunity to review the Trait Organizer Anchor Chart and again identify the pattern that all the traits’ functions throughout the chart are “**to help the plants/animals grow and survive**”.

*\*\*\*This chart should be continuously revisited and added to as you and your class make your way through all of the “What if I Had...” books. It is suggested that you read a book and stop to take notes throughout a day or over a couple of days. The books are high interest, but you do not want to read all of the books at one setting. Use them as you see fit, they are meant to be a resource for you to use in guiding your students in the process of investigating animal traits and their purposes.*

#### **ACTIVITY 2 (targets SEP8, CCC1, LS1.A):**

**Framing:** In this activity, students will learn about animal ears through a class read (What if I Had Animal Ears?). In the next activity, they will design a pair of ears out of provided materials that will serve a specific purpose of their choosing.

Going back to the topic at hand, ask “Do all animals have large, long, wide ears?” (No.) “Do all rabbits have big, tall, wide ears? Let’s do an internet search to find out.” “Why do you think it is that they have big ears for their body? What might this tell us about what all rabbits do to survive?” Clearly state that “We have explored many animal traits, looking for patterns. Today we are going to collect some data on what patterns we see in animal ears that might help them to survive.” Explain to the students that, “After exploring another one of Sandra Markle’s books, “What if I Had Animal Ears?!” they will each be in charge of using their learning to design special ears that serve a special purpose.

If wanted, show students the materials, so they can be thinking about what they might use as you read. Tell students they will need to be able to explain the design they used for their ears and its purpose after they have created them. Example, “*I made my ears large, tall, and wide like a rabbit so I can open them wide to hear quiet sounds from far away. This way, a predator can’t sneak up on me!*”

Spend the next 10 minutes reading several pages of the What if you had Animal Ears? book. Pause after each animal and ask questions to prompt student thinking about the animal ear’s structure or function/compare with a previous animal/identify patterns in either structure or function.

Example questions:

- “What would having jackrabbit ears help you do?” (*Hear better to run from predators and cool off when it’s hot*)
- “Can Tasmanian Devil’s hear well?” (Yes.) “But do they have the same size ears as rabbits?” (No.)
- “What do Koala ears look like? How do they help koalas?”
- “If it were really hot outside, which ears would you want to have? Why?”

Have students add onto their Unit Trait Organizer.

#### **ACTIVITY 3 (targets SEP6, CCC6, LS1.A):**



**Framing:** After reading the book together as a class and identifying several different ear structures and their functions for survival, students will work in pairs to design a pair of ears out of provided materials that will serve a specific purpose of their choosing.

Review what several types of ears students learned about look like and how they help that particular animal survive. After several students have shared out responses, remind them that now they get to create their own ears based on the animal ears. The purpose of this activity is to identify something they want to do that will help them survive (e.g. hear better, run faster, hunt prey, stay warm, hide...) and then create ears that will help them do that.

Release students to identify the purpose and then work on their design - this may be on whiteboards or plain paper. Tell students once they are finished, they have to explain their design to another student and then to the teacher before they grab and start using materials. (*\*Remind students that there is a limited number of supplies, so they need to share and be creative in their thinking.*)

*\*\*The possibilities of what students come up with are vast! Please allow them their creativity and wait to see how they explain their design. If students are stuck and having trouble starting their design or making their ears, they could look in the book for ideas or work with a partner.\*\**

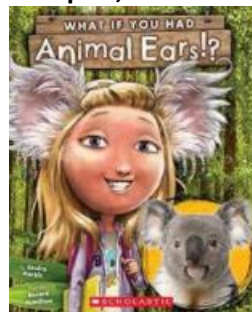
When the creating and explaining is complete, or if you have fast finishers ask them to write about the “What if you had...” books in their science notebooks. They could recreate a portion or all of the Trait Organizer Anchor Chart as well. Display the “What if you had...” books so they can see all covers and look back through them to see the traits that are most interesting to them. Tell them to focus on two traits they liked the best. They will be investigating a trait closer in the next lesson and they need to have a few ideas in case their trait doesn’t work out as they hoped.

**ACTIVITY 4 (targets LS1.A, CCC6):**

**Share-out** → Students will share their designs and reasoning. The format may vary but consider having them share in small groups or the whole class. One format would be in the form of a “fashion show”, in which partners would wear their ears (attach to paper headbands) walk “down the aisle” and then explain the structure and function of the ears. **\*\*A digital record of this project would be a powerful component so utilizing the technology opportunity below is strongly recommended. Technology Opportunity: Utilize applications such as Seesaw or Explain Everything to take a photo or video to record students’ explanations of the ears they created. This is a great opportunity for teachers to listen to students’ responses at their own leisure and check for student understanding. Applying their learning to the creation of ears and explaining the design characteristics (size, color, shape) of their ears will demonstrate student understanding of a trait (structure) and its function.**

End the lesson with the students writing and drawing two traits they want to investigate deeper.

**Photos of all resources: Books, poster examples, etc.**



Seesaw: Seesaw Le Offers In-App



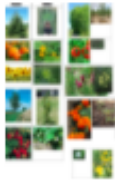



Classic Explain Everything™ Explain Everything sp. z o.o. >



Probe	Read Aloud	Technology Opportunity
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Unit Long Trait Organizer

\*Please fill in with what your students observe and point out

Plant or Animal	Trait Structure (Design)	Trait Function (Purpose)
	<p>Roots are long, tough</p> <p>Leaves are flat and green</p> <p>Stem is hollow and straight</p>	<p>Roots anchor the plant and feed it so it can grow.</p> <p>Leaves catch sun</p> <p>Stems act like straws for water to help plants grow and survive.</p>
	<p>Long thin legs on small feet</p>	<p>Pronghorn long legs and small feet help them run away from predators to help them survive.</p>
	<p>Rattlesnakes have long sharp fangs</p>	<p>Fangs inject venom to kill food so rattlesnakes can grow and survive.</p>
	<p>Porcupine quills are still needle-like hairs</p>	<p>Porcupine quills can poke enemies to help them survive.</p>
	<p>Koala ears are big and round</p>	<p>Koala hair is oily and fuzzy for protection from wind to help them grow and survive.</p>
	<p>Duck feet are big and webbed</p>	<p>Duck feet help ducks swim fast and dive for food in order to grow and survive.</p>