

4th Grade Mystery Science Organisms Functioning in their Environment Lesson Alignment and Support Part 1 Salt Lake City School District 2021-2022

Mystery Science Lesson Rationale:

Mystery Science Lessons seek to promote engagement and inspire excellence in students' mastery of science and engineering. The lessons support our vision and mission of equity and access in elementary science. The sequence of Mystery Science Full Lessons and Mini-Lesson below support fourth grade students' sense-making with respect to Organisms Functioning in their Environment using three-dimensional instruction. The sequenced Mystery Science Lessons support fourth grade teachers in implementing the new Utah SEEd Standards about organisms identified specifically in the district Pacing Guide. Lessons include a video focused on an organism-based phenomenon, a hands-on activity, and an assessment. The lessons are designed to take students approximately 60 minutes to complete. Most lessons use minimal materials, such as paper printouts and pencils. Additionally, most paper printouts can be downloaded individually from the Mystery Science Lessons websites in the form of an editable document that can be assigned through Canvas. Some lessons suggest markers, group work, or demonstrations. Teachers can make easy modifications to these lessons based on students' and teachers' resources.

Print this [Mystery Science PDF Booklet](#) for students to use to complete the lesson series below! Or you can print individual lesson materials for students by following the links in the Materials per Student and Assessments.

Strand 4.1: Organisms Functioning in their Environment Through the study of organisms, inferences can be made about environments both past and present. Plants and animals have both internal and external structures that serve various functions for growth, survival, behavior, and reproduction. Animals use different sense receptors specialized for particular kinds of information to understand and respond to their environment. Some kinds of plants and animals that once lived on Earth can no longer be found. However, fossils from these organisms provide evidence about the types of organisms that lived long ago and the nature of their environments. Additionally, the presence and location of certain fossil types indicate changes that have occurred in environments over time.

Standard 4.1.1: Construct an explanation from evidence that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction. Emphasize how structures support an organism's survival in its environment and how internal and external structures of plants and animals vary within the same and across multiple Utah environments. Examples of structures could include thorns on a stem to prevent predation or gills on a fish to allow it to breathe underwater. (LS1.A)

Standard 4.1.2: Develop and use a model of a system to describe how animals receive different types of information from their environment through their senses, process the information in their brain, and respond to the information. Emphasize how animals are able to use their perceptions and memories to guide their actions. Examples could include models that explain how animals' sense and then respond to different aspects of their environment such as sounds, temperature, or smell. (LS1.D)

Mystery Science Lesson	Suggested Date and SEEd Alignment	Materials and Assessments	Remote Learning Modifications
Set up science notebooks	August 24	Materials per Student: Composition book Pencil	Ready to Teach <i>Online students</i> Send students home with a science notebook for the school year.
Anchor Lesson Owl Ambush	August 30	Materials per Student: See-Think-Wonder chart	Ready to Teach <i>Online students</i>

<p>Human Machine Unit</p> <p>The anchoring phenomenon for this unit is an owl catching its prey. Students generate observations and questions about the phenomenon and create an initial model to explain how the owl's body systems work together to catch prey.</p> <p>Before starting this lesson, review the unit Teacher Guide for an overview of the Human Machine Anchor Layer.</p>	<p>SEEd Standard 4.1.1</p> <p>Disciplinary Core Ideas: LS1.A (Structure and Function)</p> <p>Science and Engineering Practice: Constructing Explanations</p> <p>Crosscutting Concept: Structure and Function</p> <p>Mystery Science Student Handouts Pdf</p>	<p>Owl System Model worksheet</p>	<ul style="list-style-type: none"> ● Send students home with handouts to complete the activity
<p>Lesson 1: Why do your biceps bulge?</p> <p>In this Mystery, students discover the mechanism by which their muscles control their bones to move their bodies. In the activity, Robot Finger, students construct a model of a human finger and observe how pulling on a string (a model for tendons) causes it to bend at the joints.</p>	<p>September 7</p> <p>SEEd Standard 4.1.1</p> <p>Disciplinary Core Ideas: LS1.A (Structure and Function)</p> <p>Science and Engineering Practice: Constructing Explanations</p> <p>Crosscutting Concept: Structure and Function</p>	<p>Materials per Student: Pencil Robot Finger Template printout Glue sticks Rulers Scissors Stack of paper Dot stickers Index cards (3X5) Paperclips string</p> <p>Literature Connections: Newsela articles for Mystery 1</p> <p>Extension: Why do our skeletons have so many bones? Mini-Lesson</p> <p>Assessments: Mystery 1: Why do your biceps bulge?</p> <p>Mystery 1: Answer Key</p> <div style="border: 1px solid black; padding: 2px; display: inline-block;"> <p>Anchor Phenomenon Lesson link</p> </div>	<p>Ready to Teach</p> <p><i>In the classroom</i></p> <ul style="list-style-type: none"> ● Have students do the activity solo. ● No supply adjustments. <p><i>Online students</i></p> <ul style="list-style-type: none"> ● Send each student home with 1 pair of scissors, 1 index card, 2 paper clips, 1 dot sticker, 18" of string and the <i>Robot Finger</i> handout

		<p>Materials per Student: See-Think-Wonder chart Owl System Model worksheet</p>	
<p>Lesson 2: What do people who are blind see?</p> <p>In this Mystery, students discover the basics of how their eyes work, and figure out some of the causes of vision problems. In the activity, Eye Model, students develop a working model of a human eye. They use a magnifying lens as a model of the cornea to explore how the structure of this lens is related to the function of our eyes.</p>	<p>September 13</p> <p>SEEd Standard: 4.1.1</p> <p>Disciplinary Core Ideas: LS1.A (Structure and Function)</p> <p>Science and Engineering Practice: Constructing Explanations</p> <p>Crosscutting Concept: Structure and Function</p>	<p>Materials per Student: Front of the Eye printout Pencil Markers or Crayons Scissors Dot stickers Index cards (3X5) Credit card size magnifiers (3x)</p> <p>Literature Connection Newsela articles for Mystery 2</p> <p>Extension: How does your heart pump blood? Mini-Lesson</p> <p>Assessments: Mystery 2: What do people who are blind see?</p> <p>What do people who are blind see? Answer Key</p> <div data-bbox="792 1335 1154 1566" style="border: 1px solid black; padding: 5px;"> <p>Anchor Phenomenon Lesson link Materials per Student: See-Think-Wonder chart Owl System Model worksheet</p> </div>	<p>Ready to Teach <i>In the classroom</i></p> <ul style="list-style-type: none"> • Have students do the activity solo. • No supply adjustments. <p><i>Online students</i></p> <ul style="list-style-type: none"> • Send each student home with 1 index card, 2 dot stickers, 1 credit card-sized magnifier and the Front of the Eye template (a digital version will not work).
<p>Lesson 3: How can some animals see in the dark?</p> <p>In this Mystery, students delve further into the workings of the eye, exploring the function of</p>	<p>September 20</p> <p>SEEd Standard: 4.1.1</p> <p>Disciplinary Core Ideas: LS1.A</p>	<p>Materials per Student: Pencil Markers or Crayons</p> <p>Literature Connection Newsela articles for Mystery 3</p>	<p>Adjust Supplies <i>In the classroom</i></p> <ul style="list-style-type: none"> • Students can do the first part of the activity with a mirror in a dark room, observing their eyes as they turn the lights

<p>their iris and pupil. In the activity, Pupil Card, students add a smaller pupil to the eye model that they created in Mystery 2. Then they observe how the changing size of the pupil controls how much light enters the eye.</p>	<p>(Structure and Function)</p> <p>Science and Engineering Practice: Constructing Explanations</p> <p>Crosscutting Concept: Structure and Function</p>	<p>Extension: Why are butterflies so colorful?</p> <p>Assessments: Mystery 3: How can some animals see in the dark?</p> <p>Answer Key: How can some animals see in the dark?</p> <div style="border: 1px solid black; padding: 5px;"> <p>Anchor Phenomenon Lesson link Materials per Student: See-Think-Wonder chart Owl System Model worksheet</p> </div>	<p>on and off. (Step 7 shows what happens.)</p> <ul style="list-style-type: none"> • Students can do Steps 8 - 15 solo. Send students home with their eye model to complete the remaining steps with a partner • Have students do the activity solo. • No supply adjustments. <p>Online students</p> <ul style="list-style-type: none"> • Students need their eye model and the Pupil Card template. Students can do the first part of the activity with a mirror in a dark room. • Students should observe their eyes as they turn the lights on and off. (Step 7 shows what happens.) Students can do Steps 8 - 15 solo but need a partner for the final steps • Students can do Steps 8 - 15 solo but need a partner for the final steps.
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Standard 4.1.2: Develop and use a model of a system to describe how animals receive different types of information from their environment through their senses, process the information in their brain, and respond to the information. Emphasize how animals are able to use their perceptions and memories to guide their actions. Examples could include models that explain how animals' sense and then respond to different aspects of their environment such as sounds, temperature, or smell. (LS1.D)

<p>Lesson 4: How does your brain control your body?</p> <p>In this Mystery, students explore the brain's role in receiving information from the senses, processing that information, and controlling the muscles to enable movement. In the</p>	<p>September 27</p> <p>Disciplinary Core Ideas: LS1.D (Information Processing)</p> <p>Science and Engineering Practice:</p>	<p>Materials per Student: Think Fast! worksheet Pencil Ruler Blank Scratch Paper</p> <p>Literature Connection Newsela articles for Mystery 4</p> <p>Extension: Why do penguins have wings if they can't fly?</p>	<p>Ready to Teach In the classroom</p> <ul style="list-style-type: none"> • Have students do the lesson's 2 short activities during class. • The reflex test activity requires two people, so you can assign this for students to complete
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<p>activity, Think Fast, students test their reflexes with two very quick experiments and one more involved activity. They learn about how we process information in our brains and then respond to that information in different ways.</p>	<p>Developing and Using Models</p> <p>Crosscutting Concept: Systems and System Models</p>	<p>Assessments: Mystery 4: How does your brain control your body? Answer Key: How does your brain control your body?</p> <div style="border: 1px solid black; padding: 5px;"> <p>Anchor Phenomenon Lesson link Materials per Student: See-Think-Wonder chart Owl System Model worksheet</p> </div>	<p>at home with a partner. Online students</p> <ul style="list-style-type: none"> • Have students do the lesson's 2 short activities at home. • The reflex test activity requires two people. • Send each student home with the Think Fast! worksheet (or assign the digital copy).
<p>Performance Task: How are animals and plants like machines?</p> <p>In the Performance Task, students research another animal or plant. They create a system model to explain how the animal's or plant's parts work together as a system to receive information, process it, and respond to its environment.</p> <p>Each teacher will need: One Animal and Plant System Model resource. This includes a brief overview of the readings for each of the four animals and one plant.</p> <p>An Animal and Plant Systems Final Project Rubric for each student. There are 3 versions; you can choose the best fit for your class.</p>	<p>October 4</p> <p>Disciplinary Core Ideas: LS1.D (Information Processing)</p> <p>Science and Engineering Practice: Developing and Using Models</p> <p>Crosscutting Concept: Systems and System Models</p>	<p>Materials per Student:</p> <ul style="list-style-type: none"> • Students will need their completed Owl System Model that they have been adding to after each mystery. • One Final Project System Model packet. This includes the list of animal and plant choices, a Research Graphic Organizer, and a template for their System Model. • One reading from our collection of Five Animal and Plant System Readings <p>Assessment: Human Machine Unit Assessment</p> <p>Human Machine Unit Assessment Answer Key</p>	<p>Ready to Teach Online students</p> <ul style="list-style-type: none"> • Send copies home with students to complete the task.