

4th Grade

Unit 3: Life Science

Duration: 4-8 weeks

Human Machine- Body, senses, and the brain

Desired Results

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<p>ESTABLISHED GOALS/ STANDARDS:</p> <p>LS1-1 Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction. [Clarification Statement: Examples of structures could include thorns, stems, roots, colored petals, heart, stomach, lung, brain, and skin.] [Assessment Boundary: Assessment is limited to macroscopic structures within plant and animal systems.]</p> <p>LS1-2 Use a model to describe that animals receive different types of information through their senses, process the information in their brain, and respond to the information in different ways. [Clarification Statement: Emphasis is on systems of information transfer.] [Assessment Boundary: Assessment does not include the mechanisms by which the brain stores and recalls information or the mechanisms of how sensory receptors function.]</p> <p>PS4-2</p>	<i>Transfer</i>	
	<p><i>Meaning</i></p> <p>ENDURING UNDERSTANDINGS: Crosscutting Concepts <i>Students will understand that...</i></p> <ul style="list-style-type: none"> ● <i>Students consider how human motion is made possible by a system of muscles, tendons and bones. Students consider the cause and effect relationship between tendons and the muscles and bones that they move.</i> ● <i>Students think about how the eye works as a system of different parts that interact to facilitate vision. Students consider how light interacts with the system to determine what images we see (cause and effect.)</i> ● <i>Students continue to think about how the eye works as a system and how changes to each part impact the system as a whole. Students also reason about the effect of changes in pupil size (cause and effect).</i> ● <i>Students identify patterns based on how their brains process information</i> 	
	<i>Meaning</i>	
	<table border="1" style="width: 100%;"> <tr> <td style="vertical-align: top;"> <p><i>Acquisition</i></p> <p>Disciplinary Core Ideas <i>Students will know...</i></p> <ul style="list-style-type: none"> ● Like a machine or robot, the body has parts, or structures, for moving around (e.g. the limbs). In order to move (one of the body’s functions), the body needs at least two things: muscles and bones. The contraction of your muscles pulls on tendons, which in </td> <td style="vertical-align: top;"> <p>Science and Engineering Practices Students will be skilled at...</p> <ul style="list-style-type: none"> ● Students build a model of a finger that they then use to construct an explanation for how fingers move. ● Students build a model of an eyeball that they then use to construct an explanation of why some people have blurry vision ● Students conduct an investigation to </td> </tr> </table>	<p><i>Acquisition</i></p> <p>Disciplinary Core Ideas <i>Students will know...</i></p> <ul style="list-style-type: none"> ● Like a machine or robot, the body has parts, or structures, for moving around (e.g. the limbs). In order to move (one of the body’s functions), the body needs at least two things: muscles and bones. The contraction of your muscles pulls on tendons, which in
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Develop a model to describe that light reflecting from objects and entering the eye allows objects to be seen.

[Assessment Boundary: Assessment does not include knowledge of specific colors reflected and seen, the cellular mechanisms of vision, or how the retina works.]

4-ETS1-2

Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.

4-ETS1-3

Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.

turn pull on the bones, causing you to move. Your external parts (such as appendages) are controlled by your brain like a marionette puppet (a topic we explore in Mystery 4). DCIs: LS1.A

- Continuing the analogy of the body as a machine or robot, we now consider its “sensors”--the sensory organs, in this lesson focusing specifically on the eyes. Students discover the basics of how their eyes work, and figure out some of the causes of vision problems. DCIs: LS1.A; Foundational for LS1.D, PS4.B
- Students delve further into the workings of the eye, exploring the function of their iris and pupil. DCIs: LS1.A; Extends LS1.D, PS4.B
- Continuing the analogy of the body as a machine or robot, we finally consider the body’s ‘build-in computer’ or central processor: the brain, and its accompanying nerves. Students explore the brain’s role in receiving information from the senses, processing that information, and controlling the muscles to enable movement. DCIs: LS1.A, LS1.D

see how pupils change in response to light. Students build a model of an eye (extending the model they built in Mystery 3) to explain how changes in pupil size changes the image that appears on the retina.

- **Students conduct investigations to explore how the brain processes information and responds to that information. Students analyze and interpret data from the investigations to determine how fast their reflexes are.**

Inquiry Questions:

- 1. Why do your biceps bulge?**
- 2. What do people who are blind see?**
- 3. How can some animals see in the dark?**
- 4. How does your brain control your body?**

Evidence		
Evaluation Criteria	Assessment Evidence	
	PERFORMANCE TASK(S):	
	OTHER EVIDENCE:	
	Unit assessment	
Learning Plan		
<i>Summary of Key Learning Events and Instruction</i>		