



LESSON PLAN

STRUCTURE AND FUNCTION OF LIVING THINGS GRADES 3-5

SUMMARY

In this activity students observe a variety of plant and animal structures, and explore how those structures help them survive. Students also learn how plant and animal structures with useful functions have inspired human engineering.



4-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.]

*DIY also aligns with 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.**

Science & Engineering Practices	Connections to Classroom Activity
<p>Engaging in Argument from Evidence</p>	<ul style="list-style-type: none"> Students research animal or plant structures and present an argument based on evidence as to the function of a structure.
Disciplinary Core Ideas	Connections to Classroom Activity
<p>LS1.A: Structure and Function Plants and animals have both internal and external structures that serve various functions in growth, survival, behavior, and reproduction.</p>	<ul style="list-style-type: none"> Students observe and study the structure and function of several different plant and animal structures.

Additional DCIs addressed by this lesson:

ETS1.B: Developing Possible Solutions

Tests are often designed to identify failure points or difficulties, which suggest the elements of the design that need to be improved. (3-5-ETS1-3)

ETS1.C: Optimizing the Design Solution

Different solutions need to be tested in order to determine which of them best solves the problem, given the criteria and the constraints. (3-5-ETS1-3)

- Students design and redesign gliders using inspiration from bird structures (biomimicry) to improve its function.

Crosscutting Concepts

Systems and System Models

Connections to Classroom Activity

- Students recognize parts of a plant or animal's entire body as having functions that help it survive in its environment.

DURATION

Two 45-minute classroom periods

PRE-ASSESSMENT QUESTIONS

Please see Discussion Questions located under the video. These can be discussed as a group or answered individually in student science notebooks.



ENGAGE

While the class watches, peel a banana, open a soda can or bottle, and write something on the board. Ask students, what structure (part of the body) is allowing you to complete all these functions? Student guesses may include arms, hands, or fingers.



EXPLORE

Tell students that for the next few minutes, you will be taking away the use of their thumbs. (If you have some willing volunteers, use athletic tape to secure their thumbs to their palms.) The rest of the students can simply tuck their

MATERIALS

- Banana
- Can of soda
- Whiteboard/markers
- Science notebooks & Pencils
- Athletic tape (optional)
- Access to internet or library

DIY Activity

- Wooden skewers
- Scissors
- Tape
- Straws
- A coin
- Sturdy construction paper



thumbs in. Now ask students to take out their science notebooks. Tell them to label a page “Structure and Function”. Ask various students to complete classroom activities such as watering a plant, filling a bottle with water, type on a keyboard, etc.

After several minutes without the use of their thumbs, ask students to summarize in their science notebooks what the function of this structure is (their thumbs).



EXPLAIN

Give students a chance to share their short description of the function of their thumbs (to be able to grasp). Ask students if they can think of other structures on their bodies, or of other living things that serve a specific function?



WATCH THE GENERATION GENIUS STRUCTURE AND FUNCTION OF LIVING THINGS VIDEO AS A GROUP

Then facilitate a conversation using the Discussion Questions.



ELABORATE

Either assign students, or allow them to choose, an animal or plant they would like to study. Students can study the unique structures on their organisms. They should present the organism and its structure, explaining the specific function of that structure as well as evidence that supports this explanation (students should cite observations that support that the structure is used for the function as they have explained it). Allow students to organize into groups based on whether their organism has certain features (wings, spikes, tails, teeth). Try to be creative so student choices overlap into several groups - features like spikes may bring plants and animals into one group. Interesting choices might include:

- Monkey (tail)
- Elk (antlers)
- Cactus (spikes)
- Pufferfish (spikes)
- Elephant (tusk)
- Venus fly trap (mouth)
- Octopus (beak)
- Parrot (beak)



EVALUATE

Evaluate student presentations from the Elaborate portion of the activity. Students should be assessed based on their ability to find and present solid evidence to support a reasonable argument.



EXTENSIONS

Using Zoe’s DIY Activity for inspiration, design other inventions or tools using biomimicry (inspiration from nature).