



Structure-Function

Lesson Concept The components of living things demonstrate a structure function relationship. The structure is how something is designed and the function is the job it does.

Link In the previous lesson, students learned that organisms are organized in a hierarchy from simple to complex structures (cells, tissues, organ, organ systems, organism). In this lesson, students learn that the parts of organisms have a specific structure that enables the part to do a specific function. In the next set of lessons, students will learn about the structures in animals and plants that enable them to transport materials.

Time 55 minutes

Materials Per Group (4-6 students)

3 Different types of balls (e.g., football, tennis ball, golf ball, basketball, soccer ball, baseball)

Discussion Prompt (R2)

Individual

Science notebook

R1 Ball T Chart if needed (see Step 8)

Advance Preparation

1. Duplicate and cut discussion prompts (R2), one prompt for each table group.
2. If obtaining balls is difficult, ask students to bring balls from home.

Procedure:

Engage *(10 minutes) Structure (what something is made of) is related to function (job or role).*

1. On the board write the words: structure and function.
2. Ask students in a think-pair, to write answers to these questions in their notebook:
 - Define structure
 - Define function

- How are they related to each other?
3. Have students discuss their ideas at their table, and then aloud to the class. Chart their ideas, letting students know that in this lesson they will explore more about these ideas.

Teacher Note: Keep the chart to review at the end of the lesson.

Explore **(15 minutes) Structure is what something is made of, its parts and how they are put together. Function is the job/role something has.**

4. Build on what the students said about structure (They may have said something like a building or how something is made). Hold up one of the balls (e.g., football) and ask students if they think this has a structure.
5. In partners have students discuss the structure of the ball: what is the shape what is it made of? What kind of stitching does it have? Does it have any distinctive parts?
6. Ask several partners to share their observations.
7. Explain that when scientists use the word “structure,” they are referring to what something is made of, its the parts and how it is put together.
8. Give each table group 3 different balls and ask groups to observe the balls and answer these questions in their notebook: What is the structure of each ball? (How is it shaped? How is it made--list as many parts as you can and explain how they are put together).

Teacher Note: If necessary, use R1 (Ball T chart) for the students. For student independence, let them create their own chart

Student responses might include: (soccer ball: black and white pentagon and hexagon shapes, smooth, many pentagons sown together; tennis ball: yellow, round, fuzzy, squiggly line that goes around it; football: oval shape, rough, pieces stitched together to form points on each end, laces on one side)

9. Select several groups to share their observations of at least one ball structure (mix the types of balls that they are sharing).
10. Ask the class: what is in common for all of these balls (they are balls) and what is different (they way they are structured)?
11. Hold up several different balls, one at a time and ask what this ball does. Conduct a discussion about how different balls are used.
12. Explain that scientist use the word “function” to describe what something does or what job it does.

Explain **(15 minutes) Structure and function are related.**

13. Distribute a discussion prompt (R2) to each table and ask students to think of as many reasons as possible to answer the prompt.
14. Have several groups share their ideas, making sure that students understand that the structure doesn't match the function and therefore the "game" can't be played.
15. Ask partners to discuss how the idea of structure/function is related to their body parts, for example: fingers separate to pick up things.
16. Ask several groups to share (e.g., elbows bend to pick up items; knees bend to walk).

Extend/Evaluate (5 minutes) Structure and function are related.

17. Review the chart the students generated in the Engage stage. With student input, identify correct ideas and draw a line through incorrect ideas.
18. See **Formative Assessment #1**.

Ball T Chart

Type of Ball	Structure

Why don't we use footballs to play golf?

Why don't we use tennis balls to play basketball?

Why don't we use handballs to play golf?

Why don't we use basketballs to play baseball?

Why don't we use golf balls to play football?

Why don't we use tennis balls to play soccer?

Why don't we use volleyballs to play football?

Why don't we use soccer balls to play tennis?

Why don't we use baseballs to play soccer?