



Adaptations 101

Connected Next Generation Science Standards

3-LS3-1 Analyze and interpret data to provide evidence that plants and animals have traits adapted from parents and that variation of these traits exists in a group of similar organisms.

Featured Science and Engineering Practices

Constructing Explanations

Featured Cross-Cutting Concepts

Structure and Function

Materials

- Teacher- White board, marker
- Cups or jars for collecting organisms
- Garden journals or notebooks
- Magnifying Lenses

Setting

- School garden or green space where students can observe a variety of living organisms.
- More plant and animal life will be around in warmer weather.

Overview

This lesson introduces the complex topic of adaptation. Students will observe organisms in the garden and interpret the structures that help them survive in their environment. If teaching about adaptation for the first time, additional adaptation explorations are needed to support their understanding.

Students will

- Understand the term **adaptation**.
- Classify adaptations as either **structural** or **behavioral**.
- Search for evidence of structural and behavioral adaptations in plants and animals.

Teacher Preparation

- Walk the school grounds or garden and identify locations where students can observe animals.

Guiding Question - How do plants and other living things adapt to their environments to survive?



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- **Walk and Talk:** Students get in two equal rows. If you have an odd number of students, join the front of the shorter line. Explain that their discussion partner will be the student directly across from them in the other row. Starting from the front of the line, students greet their discussion partner across to ensure there is no confusion. Pose a question and walk. Students discuss until you stop walking. Once you pause, students raise hands to share out their discussions.
- An **organism** is any organic living system that functions as an individual entity. Remind students that an organism can be any plant, person or animal, or single-celled life form.

Explore

- As you are walking out to the garden, use the **Walk and Talk** discussion method. What do animals and plants need to survive? What are some unique plants or animals you have seen in the garden? What makes them different?
- Explain to students that today they will be looking closely at an organism's physical structures and behaviors to see how they help an organism to survive in its environment.
- Ask students, Where do you think you will find animals in the garden? Brainstorm where and how to look for garden organisms.
- Pair students up and pass out a hand lens and a cup for collecting organisms to each pair.
- Give students a couple minutes to collect an organism that is in abundance in the school garden. Possible organisms could be worms, pill bugs (roly-poly), or ants
- Allow students time to observe the organisms closely and discuss what they notice about the animal's body part with their partner.
- Students should record any observations they make about the organism's structures and behaviors in their journal.

Digging Deeper

- Bring students, along with their organisms, back together before they get bored or distracted.
- As a group, ask students, What are some structures they noticed on their organisms? Write down responses on a white board.



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- Examples of **structural adaptations** students may recognize: insects' wings, thorny stems for protection, camouflage coloring, and colorful flowers to attract pollinators.
- Examples of **acquired structures**, or structures that are un-inherited, would be things like scars, holes in leaves, or missing feathers on a bird due to an injury.
- Examples of **behavioral adaptations** that students may know: hibernation, roots growing down into soil, and vines growing upward to reach sunlight.
- After you've collected a list of structures, ask students, Do you think the structure was predetermined when it was born or added later? Which structures were inherited (or passed down from their parent) and which were not? Introduce the term "adaptation" by writing it on the board and reading it to students.
- **Adaptations** are inheritable structures along with behaviors that help an organism survive in its habitat.
- With this definition, have students identify which structures would be adaptations (marking out the un-inherited structures).
- Next, have students go through the list and identify how each structure would help the organism to function or survive in its natural environment.
- Refer back to the definition of adaptations, pointing out that adaptations also include inherited behaviors. Ask students, What are some examples of behaviors you noticed in the organism? Write these on the board.
- Then, with students, mark out those behaviors that are not inherited and beneficial to survival.

Making Connections

- Have students get back in two equal rows for another Walk and Talk discussion routine as you go back to the building. If you use the same student order as before, rotate one of the students in one row to the back of the line. The line will shift forward one person, so there are new discussion partners.



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- While walking to the building, ask students, What are some other examples of structural adaptations that you have seen in other organisms (humans, animals, plants)?
- After students have discussed this with partner, stop walking and have a few students share out what they discussed.
- What are some behavioral adaptations you have observed in other organisms? Allow students time to share out before entering back into the building.

This lesson structure was influenced by the "Adaptations Intro- Live!" lesson by BEETLES™ at The Lawrence Hall of Science, <http://beetlesproject.org>.

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