Cicada Shell

Life Science | Lesson Guide

Kindergarten

Photo Description

This image shows a brown, papery shell left behind on a tree trunk surrounded by lichen. The shell looks like a hollow bug case that has split open down the middle. Around it, you can see colorful green and gray lichen growing on the bark, which are special living things that grow on trees.

Scientific Phenomena

Anchoring Phenomenon: This is a cicada exoskeleton (or molt/shed skin)—the empty shell left behind when a cicada grows too big for its outer skin.

Why This Happens: Cicadas are insects that grow by shedding their hard outer skin several times during their life. When a cicada gets too large for its exoskeleton, it splits the shell open and crawls out, leaving behind the empty case. This process is called ecdysis or molting. The cicada grows new, larger skin underneath before crawling out. This is a form of incomplete metamorphosis and is part of the cicada's natural life cycle. Young cicadas spend years underground before emerging as adults, and this shell-shedding happens multiple times during their development.

Core Science Concepts

1. Growth and Life Cycles: Living things grow and change over time. Insects like cicadas grow by shedding their outer skin when it becomes too small.

2. Structures and Functions: The exoskeleton protects the soft body inside and gives the insect its shape. Once the insect outgrows it, a new skeleton forms underneath.

3. Habitats and Ecosystems: Trees provide homes and places for insects to go through their life changes. Lichen also grows on trees, showing multiple living things sharing the same space.

4. Observable Evidence of Life: Finding shed shells helps us see that insects are living in our environment, even if we don't always see the insects themselves.

Pedagogical Tip:

Kinesthetic Connection: Let students act out the molting process by having them crouch inside a "shell" (a hula hoop or circle on the floor) and then "grow" by slowly stepping out and standing tall. This embodied learning helps young learners understand the concept concretely before discussing the abstract idea.

UDL Suggestions:

Multiple Means of Engagement: Provide both real cicada shells (if available, sanitized) and high-quality images for students to observe. Some children learn best through tactile exploration, while others benefit from visual focus. Label key parts of the shell with simple words and corresponding pictures to support emerging readers and English language learners.

Discussion Questions

1. What do you think happened to the bug that was inside this shell? (Bloom's: Remember | DOK: 1)

2. Why do you think the shell split open in the middle? (Bloom's: Analyze | DOK: 2)

3. If you could touch this shell, what do you think it would feel like, and why? (Bloom's: Infer | DOK: 2)

4. Can you find other evidence on this tree that shows bugs or animals live here? (Bloom's: Evaluate | DOK: 3)

Extension Activities

1. Cicada Shell Hunt: Take students on a nature walk around the school grounds or playground in late spring/summer to search for cicada shells on trees, fences, or structures. Create a classroom display of found shells (sanitized) with labels and student drawings. This builds observation skills and gets students moving outdoors.

2. Growth and Shedding Role-Play: Provide each student with a large paper bag to decorate as their "exoskeleton." Have them practice stepping out of the bag while you read a simple cicada story aloud. Follow up with a group discussion about why cicadas need to molt and how they feel when they grow.

3. Comparing Life Changes: Create a simple picture chart showing different ways animals grow and change (caterpillar to butterfly, tadpole to frog, baby to child, cicada shedding skin). Have students sort and match pictures, helping them understand that all living things grow in different ways.

NGSS Connections

Performance Expectation: K-LS1-1 Use observations to describe patterns of what plants and animals (including humans) need to survive.

Disciplinary Core Ideas:
- K-LS1.B Growth and Development of Organisms
- K-LS1.D Information Needed to Determine if Something Is Alive

Crosscutting Concepts:
- Patterns (Life cycles follow patterns; molting happens in cycles)
- Structure and Function (The exoskeleton's structure protects and shapes the insect)

Science Vocabulary

* Exoskeleton: A hard outer shell that protects an insect's body on the outside, like a suit of armor.

* Molt (or Shed): When an animal gets too big for its skin and leaves it behind to grow a new, bigger one.

* Life Cycle: All the stages a living thing goes through from birth to becoming an adult and having babies.

* Lichen: A living thing that grows on rocks and trees and looks fuzzy or crusty; it is made of two organisms working together.

* Insect: A small animal with six legs, a body in three parts, and usually wings.

External Resources

Children's Books:
- The Very Hungry Caterpillar by Eric Carle (introduces life cycles and growth)

- Bugs by Gail Gibbons (informational text about insects, including cicadas)
- From Caterpillar to Butterfly by Deborah Heiligman (simple life cycle narrative)

YouTube Videos:
- "Cicada Molting Time-Lapse," National Geographic Kids (~2 minutes) — Shows a cicada shedding its skin in real time. https://www.youtube.com/results?search_query=cicada+molting+national+geographic+kids

- "What is a Life Cycle?" by Crash Course Kids (~4 minutes) — Age-friendly overview of life cycles including insects. https://www.youtube.com/watch?v=Wo1F_nGnL2U