Cicada

Life Science | Lesson Guide

1st Grade

Photo Description

A big brown bug with clear wings sits on a tree branch. The bug has large eyes and a thick body. Its wings have lines that look like a pattern.

Scientific Phenomena

This image shows a cicada emergence phenomenon - when adult cicadas come out from underground after living there for years. The cicada has just finished changing from its young form (nymph) into its adult form through a process called metamorphosis. This happens when soil temperature reaches the right warmth, triggering thousands of cicadas to emerge at the same time to find mates and lay eggs.

Core Science Concepts

1. Life Cycles: Cicadas go through incomplete metamorphosis with three stages - egg, nymph, and adult
2. Animal Structures: The cicada's large eyes help it see, strong legs help it climb, and wings help it fly to find food and mates
3. Seasonal Changes: Cicadas emerge when the weather gets warm enough, showing how animals respond to environmental changes
4. Animal Behaviors: Cicadas make loud sounds to communicate with other cicadas

Pedagogical Tip:

Use hand motions to act out the cicada life cycle - start crouched down as an egg, crawl as a nymph underground, then "emerge" and spread arms like wings as an adult. This kinesthetic approach helps first graders remember the sequence.

UDL Suggestions:

Provide multiple ways for students to show their learning about cicadas - drawing the life cycle, acting it out, building with blocks, or using picture cards to sequence events. This supports different learning preferences and abilities.

Zoom In / Zoom Out

1. Zoom In: Inside the cicada's body are special muscles that vibrate very fast to make the loud buzzing sounds we hear - like a tiny drum beating hundreds of times per second
2. Zoom Out: Cicadas are part of the forest food web, providing food for birds, spiders, and other animals when they emerge, which helps keep nature in balance

Discussion Questions

1. What do you notice about how this cicada looks different from other bugs you've seen? (Bloom's: Analyze | DOK: 2)
2. Why do you think cicadas have such big eyes? (Bloom's: Evaluate | DOK: 3)
3. How might baby cicadas be different from this adult cicada? (Bloom's: Apply | DOK: 2)
4. What would happen if all the cicadas came out at different times instead of together? (Bloom's: Synthesize | DOK: 3)

Potential Student Misconceptions

1. Misconception: "Cicadas are scary and will hurt me"
   Reality: Cicadas are gentle insects that don't bite or sting people - they only eat tree sap
2. Misconception: "All bugs look the same when they grow up"
   Reality: Young cicadas (nymphs) look very different from adult cicadas and live underground
3. Misconception: "Cicadas come out every summer"
   Reality: Most cicadas only emerge every few years, spending most of their lives underground

Cross-Curricular Ideas

1. Math Connection - Counting & Patterns: Count the number of lines on the cicada's wings and create repeating patterns using the colors and shapes found on the cicada (stripes, circles, triangles). Students can make their own wing patterns using markers on paper.

2. ELA Connection - Story Writing: Have students dictate or write a simple story about a baby cicada's journey underground and what happens when it emerges as an adult. They can illustrate their stories and create a class book titled "Our Cicada Stories."

3. Art Connection - Nature Collage: Students create a cicada using natural materials like leaves, twigs, paper, and paint. This helps them observe details of the insect's body parts while developing fine motor skills and artistic expression.

4. Social Studies Connection - Community Helpers: Discuss how scientists called entomologists study insects like cicadas to learn about nature and help us understand the world. Students can role-play being scientists observing cicadas in nature.

STEM Career Connection

1. Entomologist (Insect Scientist): An entomologist is a scientist who studies insects like cicadas. They watch bugs, learn about their life cycles, and figure out how to help keep insects healthy and keep them from damaging plants. They work outside in nature and in laboratories with microscopes.
   Average Annual Salary: $65,000 USD

2. Wildlife Biologist: A wildlife biologist studies all kinds of animals and insects in nature, including cicadas. They learn where cicadas live, what they eat, and how they fit into the forest ecosystem. They help protect nature and teach people about animals.
   Average Annual Salary: $68,000 USD

3. Science Teacher/Educator: A science educator teaches students about insects and nature, just like you're learning right now! They show kids how to observe bugs, ask questions, and discover how the natural world works through hands-on activities and exploration.
   Average Annual Salary: $62,000 USD

NGSS Connections

- Performance Expectation: 1-LS1-2 Read texts and use media to determine patterns in behavior of parents and offspring that help offspring survive
- Disciplinary Core Ideas: 1-LS1.B Adult plants and animals can have young
- Crosscutting Concepts: Patterns - Patterns in nature can be observed and used to make predictions

Science Vocabulary

* Cicada: A large insect that lives underground as a baby and comes out to fly and make loud sounds
* Emerge: To come out from a hidden place
* Nymph: The young form of some insects before they become adults
* Life cycle: The different stages an animal goes through as it grows and changes
* Metamorphosis: When an animal changes from one form to another as it grows up

External Resources

Children's Books:
- Cicadas! Strange and Wonderful by Laurence Pringle
- Waiting for Wings by Lois Ehlert
- The Very Hungry Caterpillar by Eric Carle (for life cycle connections)