

Photo Description



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Scientific Phenomena

This image represents the Anchoring Phenomenon of cicada emergence and adult behavior. Cicadas are insects that spend most of their lives underground as nymphs, feeding on tree root fluids. After 13-17 years (depending on species), they emerge from the soil, climb onto trees or plants, and molt into their adult form. The adult cicada shown here will live for only a few weeks, during which it focuses on mating and reproduction. Males produce loud calls using specialized organs called tymbals to attract females, creating the characteristic summer sounds many people associate with hot weather.

Core Science Concepts

1. Life Cycles: Cicadas demonstrate complete metamorphosis with distinct life stages - egg, multiple nymph stages, and adult
2. Animal Needs: Like all living things, cicadas need food (tree sap), water, air, and shelter to survive
3. Animal Behaviors: Cicadas exhibit specific behaviors like climbing, molting, and sound production for communication
4. Habitats: Trees and underground environments provide everything cicadas need to complete their life cycle

Pedagogical Tip:

Use real cicada shells (exoskeletons) if available in your area, as first graders learn best through hands-on exploration. The empty shells are safe to handle and help students understand that animals can grow out of their "skin."

UDL Suggestions:

Provide multiple ways to explore cicada sounds - play recordings, use musical instruments to mimic the rhythm, or have students hum at different pitches. This supports auditory learners while making the concept accessible to students with different learning preferences.

Zoom In / Zoom Out

1. Zoom In: At the cellular level, cicadas have specialized muscle cells in their tymbals that contract rapidly (up to 400 times per second) to create their loud mating calls. Their compound eyes contain thousands of individual photoreceptor cells that help them detect movement and navigate.

2. Zoom Out: Cicadas play important roles in forest ecosystems - their nymphs aerate soil while tunneling, adults serve as food for birds and other predators, and their mass emergence provides a significant nutrient pulse to the food web when they die and decompose.

Discussion Questions

1. What body parts help the cicada live on trees? (Bloom's: Analyze | DOK: 2)
2. How do you think the cicada uses its wings? (Bloom's: Apply | DOK: 2)
3. Why might cicadas need to make loud sounds? (Bloom's: Evaluate | DOK: 3)
4. What would happen if there were no trees for cicadas to live on? (Bloom's: Synthesize | DOK: 3)

Potential Student Misconceptions

1. Misconception: "Cicadas are dangerous and will hurt people"
Reality: Cicadas are completely harmless to humans - they don't bite or sting and are actually quite gentle insects
2. Misconception: "All insects live for the same amount of time"
Reality: Different insects have very different lifespans - cicadas live underground for many years, while some other insects live only days or weeks
3. Misconception: "Cicadas are the same as grasshoppers because they're both noisy"
Reality: While both make sounds, cicadas and grasshoppers are different types of insects with different body parts and life cycles

Cross-Curricular Ideas

1. Math - Counting & Patterns: Have students count the legs, wings, and eyes on pictures of cicadas. Create patterns using cicada sounds - short sound, long sound, short sound, long sound - and have students continue the pattern. Use a number line to show how long cicadas live underground (13-17 years).
2. ELA - Descriptive Writing & Sound Words: Read cicada-themed picture books aloud and discuss descriptive words (loud, brown, buzzing). Have students draw a cicada and label body parts with sight words. Create a class book of "sounds we hear in summer" where cicadas are featured, using onomatopoeia like "buzz," "hum," and "chirp."
3. Art - Nature Collage & Color Mixing: Provide students with red, orange, brown, and green materials (paper, paint, natural items) to create cicada artwork that matches the colors in the photo. Have them paint or color cicada wings with watercolors to explore how light passes through transparent materials, just like real cicada wings.
4. Social Studies - Seasonal Changes & Community: Discuss how cicadas help us know when summer is arriving. Create a calendar showing the seasons and mark when cicadas appear in your local area. Talk about how different communities around the world experience different insects and seasons.

STEM Career Connection

1. Entomologist (Bug Scientist): An entomologist studies insects like cicadas to learn about how they live, what they eat, and how they help nature. They observe bugs, take notes, and sometimes teach others about insects. They might work in a museum, university, or nature center. Average Salary: \$65,000/year

2. Wildlife Photographer: A wildlife photographer takes pictures of animals and insects in nature, just like the photo you're looking at! They use special cameras to capture insects doing interesting things. Their photos help people learn about and appreciate wildlife. They might sell photos to magazines or create educational materials. Average Salary: \$32,000/year

3. Park Ranger or Naturalist: A park ranger works in forests and parks where cicadas live. They teach visitors about nature, help protect habitats, and watch for changes in wildlife populations. They might lead nature walks or give presentations about insects and ecosystems. Average Salary: \$38,000/year

NGSS Connections

- Performance Expectation: 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
- Disciplinary Core Ideas: 1-LS1.A - All organisms have external parts that they use to perform daily functions
- Crosscutting Concepts: Structure and Function - The shape and stability of structures of natural objects are related to their function

Science Vocabulary

- * Cicada: An insect that lives underground for many years then comes out to live in trees
- * Wings: Body parts that help insects fly from place to place
- * Insect: A small animal with six legs and three body parts
- * Emerge: To come out from a hiding place
- * Molt: When an animal sheds its old skin to grow bigger

External Resources

Children's Books:

- Cicadas! Strange and Wonderful by Laurence Pringle
- Thirteen-Year Cicada by Rebecca Hirsch
- Waiting for Wings by Lois Ehlert