

Photo Description



A monarch butterfly caterpillar hangs from a stick. The caterpillar has yellow, black, and white stripes. Next to it is an empty shell that looks like a clear bag.

Scientific Phenomena

This image captures the monarch butterfly metamorphosis - specifically the moment after a caterpillar has shed its skin (molted) or is preparing to form its chrysalis. The striped caterpillar represents the larval stage, while the translucent structure nearby is likely a shed skin (exuvia) from a previous molt. This phenomenon occurs because the caterpillar's rigid exoskeleton cannot stretch as the insect grows, requiring periodic shedding and replacement with a larger outer covering.

Core Science Concepts

1. Life Cycles: Animals go through different stages as they grow and change from babies to adults
2. Growth and Development: Living things need to shed their outer covering when they get too big for it
3. Structure and Function: The caterpillar's striped pattern serves as a warning to predators that it may be poisonous
4. Basic Needs: Caterpillars need food (milkweed plants) and safe places to grow and change

Pedagogical Tip:

Use hand motions and role-playing to help first graders understand molting - have them pretend to outgrow their clothes and need bigger ones, just like the caterpillar outgrows its skin.

UDL Suggestions:

Provide multiple ways for students to represent their learning about butterfly life cycles through drawing, acting out the stages, creating clay models, or using movement to show each transformation.

Zoom In / Zoom Out

1. Zoom In: Inside the caterpillar's body, special groups of cells called imaginal discs are already forming the parts that will become butterfly wings, legs, and antennae during metamorphosis.
2. Zoom Out: This monarch caterpillar is part of a larger migration pattern where butterflies travel thousands of miles across North America, connecting ecosystems from Canada to Mexico.

Discussion Questions

1. What do you notice about the caterpillar's colors and patterns? (Bloom's: Observe | DOK: 1)
2. Why do you think the caterpillar needs to shed its skin? (Bloom's: Analyze | DOK: 2)
3. How is this caterpillar similar to and different from the butterfly it will become? (Bloom's: Compare | DOK: 2)
4. What would happen if caterpillars couldn't shed their skin as they grew? (Bloom's: Predict | DOK: 3)

Potential Student Misconceptions

1. Misconception: The caterpillar and butterfly are completely different animals
Reality: They are the same animal at different life stages, like how a human baby grows into an adult
2. Misconception: The empty skin means the caterpillar is hurt or sick
Reality: Shedding skin is healthy and normal - caterpillars must do this to grow bigger
3. Misconception: All caterpillars become the same type of butterfly
Reality: Each type of caterpillar becomes a specific type of butterfly or moth

NGSS Connections

- Performance Expectation: 1-LS3-1 Make observations to construct an evidence-based account that young plants and animals are like, but not exactly like, their parents
- Disciplinary Core Idea: 1-LS3.A - Young animals are very much, but not exactly, like their parents and also resemble other individuals of the same kind
- Crosscutting Concept: Patterns - Patterns in the natural world can be observed and used as evidence

Science Vocabulary

- * Caterpillar: The young form of a butterfly that looks like a worm with many legs
- * Molt: When an animal sheds its old skin to grow a new, bigger one
- * Life cycle: The different stages a living thing goes through as it grows up
- * Metamorphosis: The big changes an animal makes as it grows from young to adult
- * Larva: The scientific name for the caterpillar stage of a butterfly's life

External Resources

Children's Books:

- The Very Hungry Caterpillar by Eric Carle
- From Caterpillar to Butterfly by Deborah Heiligman
- Monarch Butterfly by Gail Gibbons

YouTube Videos:

- "Monarch Butterfly Life Cycle" - Time-lapse footage showing all stages of monarch development from egg to butterfly (https://www.youtube.com/watch?v=LFr55_-5w2M)
- "How Does a Caterpillar Turn into a Butterfly?" by SciShow Kids - Simple explanation of metamorphosis for young learners (https://www.youtube.com/watch?v=hS_AXiLn9NM)