

Photo Description



This photo shows two chrysalises hanging from a building corner. One chrysalis is brown and looks empty with a clear window. The other chrysalis is bright green with small yellow spots and a black line at the top.

Scientific Phenomena

The anchoring phenomenon shown here is metamorphosis - specifically the pupal stage of a butterfly's life cycle. The green chrysalis contains a caterpillar that is transforming into a butterfly through a process called complete metamorphosis. Inside the chrysalis, the caterpillar's body is breaking down and rebuilding into completely different body parts like wings, antennae, and reproductive organs. The brown chrysalis shows evidence that a butterfly has already emerged, leaving behind the empty pupal case.

Core Science Concepts

1. Life Cycles: Butterflies go through four distinct stages - egg, larva (caterpillar), pupa (chrysalis), and adult butterfly
2. Complete Metamorphosis: The dramatic transformation where an organism's body structure completely changes during development
3. Adaptation: The chrysalis provides protection during the vulnerable transformation period
4. Growth and Development: Living things change over time in predictable patterns

Pedagogical Tip:

Use real chrysalises or high-quality photos like this one rather than cartoon illustrations. Students need to see authentic scientific phenomena to develop accurate mental models of metamorphosis.

UDL Suggestions:

Provide multiple ways for students to track metamorphosis by offering choices: drawing life cycle diagrams, creating clay models of each stage, acting out the transformation, or building a timeline with photos.

Zoom In / Zoom Out

1. Zoom In: Inside the chrysalis, special groups of cells called "imaginal discs" are rapidly dividing and forming new body parts. Hormones control when the old caterpillar tissues dissolve and new butterfly structures develop.
2. Zoom Out: This metamorphosis is part of a larger ecosystem cycle where butterflies will pollinate flowers, helping plants reproduce, while also serving as food for birds and other animals in the food web.

Discussion Questions

1. What evidence do you see that tells you one butterfly has already emerged? (Bloom's: Analyze | DOK: 2)
2. Why might it be important for the chrysalis to be hard on the outside? (Bloom's: Evaluate | DOK: 3)
3. How is a butterfly's life cycle similar to and different from a human's life cycle? (Bloom's: Compare | DOK: 2)
4. What do you predict will happen to the green chrysalis in the next few days? (Bloom's: Predict | DOK: 2)

Potential Student Misconceptions

1. Misconception: The caterpillar just grows wings inside the chrysalis
Reality: The caterpillar's body completely breaks down and rebuilds into a butterfly with entirely different body systems
2. Misconception: All insects make chrysalises
Reality: Only butterflies make chrysalises; moths make cocoons, and many other insects have different life cycles
3. Misconception: The transformation happens quickly
Reality: The pupal stage typically lasts 1-2 weeks, with complex changes happening gradually

NGSS Connections

- Performance Expectation: 3-LS1-1 - Develop models to describe that organisms have unique and diverse life cycles but all have in common birth, growth, reproduction, and death
- Disciplinary Core Ideas: 3-LS1.B Growth and Development of Organisms
- Crosscutting Concepts: Patterns - Students observe patterns in life cycles across different organisms

Science Vocabulary

- * Chrysalis: The hard protective case where a caterpillar transforms into a butterfly
- * Metamorphosis: The process of changing from one form to another during an animal's life cycle
- * Larva: The caterpillar stage of a butterfly's life cycle
- * Pupa: The stage when an insect is inside its chrysalis or cocoon transforming
- * Life cycle: The stages a living thing goes through as it grows and develops

External Resources

Children's Books:

- From Caterpillar to Butterfly by Deborah Heiligman
- The Very Hungry Caterpillar by Eric Carle
- Waiting for Wings by Lois Ehlert

YouTube Videos:

- "Monarch Butterfly Metamorphosis Time Lapse" - Shows real footage of transformation process: <https://www.youtube.com/watch?v=ocWgSgMGxOc>
- "Butterfly Life Cycle for Kids" by National Geographic Kids - Educational overview with real footage: <https://www.youtube.com/watch?v=kmKeHHp6eEY>