

## Photo Description



A green chrysalis hangs from a wooden fence. The chrysalis is smooth and shaped like a small bag. It is attached to the wood by a thin stem at the top.

## Scientific Phenomena

This image shows the pupation stage of butterfly metamorphosis - specifically a monarch butterfly chrysalis. The anchoring phenomenon is complete metamorphosis, where the caterpillar has formed a protective casing around itself while its body completely transforms into a butterfly. Inside this green chrysalis, the caterpillar's tissues are breaking down and reorganizing into wings, antennae, legs, and other butterfly parts through a process called histolysis and histogenesis.

## Core Science Concepts

1. Life Cycles: Animals go through different stages as they grow and change throughout their lives.
2. Metamorphosis: Some animals completely change their body shape and form as they develop from babies to adults.
3. Animal Needs: Animals need safe places to grow and develop, like this protected chrysalis.
4. Adaptation: The hard chrysalis protects the developing butterfly from weather and predators.

### Pedagogical Tip:

Use real chrysalises or high-quality photos rather than cartoon illustrations to help students understand that metamorphosis is a real scientific process, not just a story concept.

### UDL Suggestions:

Provide tactile models or 3D printed chrysalises for students to touch and examine, supporting kinesthetic learners and students with visual impairments in understanding the structure.

## Zoom In / Zoom Out

1. Zoom In: Inside the chrysalis, special cells called imaginal discs are rapidly dividing and growing to form butterfly wings, legs, and antennae while the caterpillar body dissolves.
2. Zoom Out: This butterfly metamorphosis is part of a larger ecosystem cycle where adult butterflies will pollinate flowers, helping plants reproduce and maintaining food webs.

### Discussion Questions

1. What do you think is happening inside this green case? (Bloom's: Analyze | DOK: 2)
2. How is this chrysalis the same or different from other animal homes you know about? (Bloom's: Compare | DOK: 2)
3. What do you predict will come out of this chrysalis? (Bloom's: Predict | DOK: 1)
4. Why do you think the chrysalis is green instead of another color? (Bloom's: Evaluate | DOK: 3)

### 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.
2. Misconception: All animals make chrysalises.  
Reality: Only some insects go through complete metamorphosis with a chrysalis stage.
3. Misconception: The chrysalis is like a house the caterpillar lives in.  
Reality: The chrysalis is made from the caterpillar's own skin and becomes part of its body.

### 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 Ideas:

- 1-LS3.A Young animals are very much, but not exactly, like their parents and also resemble other animals of the same kind.

Crosscutting Concepts:

- Patterns Students observe patterns in how butterflies develop through predictable stages.

### Science Vocabulary

- \* Chrysalis: The hard case that protects a caterpillar while it changes into a butterfly.
- \* Metamorphosis: When an animal completely changes its body shape as it grows up.
- \* Life cycle: All the stages an animal goes through from birth to death.
- \* Pupa: The stage when an insect is changing from a larva into an adult.
- \* Transform: To change from one form into a completely different form.

### External Resources

Children's Books:

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

YouTube Videos:

- "Monarch Butterfly Metamorphosis Time Lapse" - Real footage showing chrysalis formation and emergence: <https://www.youtube.com/watch?v=ocWgSgMGxOc>



## Chrysalis — 1st Grade Lesson Guide

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- "Butterfly Life Cycle for Kids" - Educational animation explaining all four stages of butterfly development: <https://www.youtube.com/watch?v=75NQK-Sm1YY>