

## Photo Description



A green chrysalis hangs from a wooden fence. The chrysalis looks like a small green bag. Inside, a caterpillar is changing into a butterfly.

## Scientific Phenomena

This image shows the metamorphosis phenomenon, specifically the pupal stage of a butterfly's life cycle. The caterpillar has formed a protective casing called a chrysalis where its body completely transforms through a process called metamorphosis. During this stage, the caterpillar's tissues break down and reorganize to form the adult butterfly's wings, antennae, legs, and reproductive organs. This dramatic transformation is controlled by hormones and typically takes 1-2 weeks depending on the species and environmental conditions.

## Core Science Concepts

1. Life Cycles: All living things go through stages of growth and change from birth to death
2. Animal Growth and Development: Young animals look different from their parents and change as they grow
3. Animal Needs: Animals need safe places to grow and develop, like the protection a chrysalis provides
4. Observable Changes: We can observe and document changes in living things over time

### Pedagogical Tip:

Use real chrysalises or high-quality photos to help students make concrete observations. Encourage them to draw what they see and predict what might happen next, building their scientific observation and prediction skills.

### UDL Suggestions:

Provide multiple ways for students to engage with this concept: tactile models of life cycle stages, movement activities where students act out each stage, and visual charts with pictures and simple words to support all learners including English language learners.

## Zoom In / Zoom Out

1. Zoom In: Inside the chrysalis, special cells called imaginal discs are growing into butterfly parts like wings and antennae. The caterpillar's body is breaking down and rebuilding at the cellular level.
2. Zoom Out: This butterfly life cycle is part of a larger ecosystem where butterflies pollinate flowers, helping plants reproduce and maintaining biodiversity in gardens, forests, and meadows.

## Discussion Questions

1. What do you think is happening inside the green chrysalis? (Bloom's: Analyze | DOK: 2)
2. Why do you think the caterpillar needs to make a chrysalis? (Bloom's: Evaluate | DOK: 3)
3. What patterns do you notice in how butterflies grow and change? (Bloom's: Understand | DOK: 1)
4. How is a butterfly's life cycle different from how you grow? (Bloom's: Compare | DOK: 2)

## Potential Student Misconceptions

1. Misconception: The caterpillar just grows wings inside the chrysalis  
Clarification: The caterpillar's entire body breaks down and rebuilds into a completely different form
2. Misconception: All animals go through metamorphosis like butterflies  
Clarification: Only some animals (like butterflies, frogs, and beetles) have complete metamorphosis; mammals like humans grow gradually
3. Misconception: The chrysalis is like a house the caterpillar lives in  
Clarification: The chrysalis is made by the caterpillar's own body and is part of the transformation process

## NGSS Connections

- Performance Expectation: K-LS1-1 - Use observations to describe patterns of what plants and animals need to survive
- Disciplinary Core Ideas: K-LS1.C - Organization for Matter and Energy Flow in Organisms
- Crosscutting Concepts: Patterns

## Science Vocabulary

- \* Chrysalis: The hard shell where a caterpillar changes into a butterfly
- \* Metamorphosis: The big changes an animal goes through as it grows up
- \* Life cycle: All the stages a living thing goes through from birth to death
- \* Caterpillar: The young form of a butterfly that looks like a worm
- \* Transform: To change from one thing into something very different

## 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:

- "Butterfly Life Cycle for Kids" - Simple animation showing all four stages of butterfly development with clear narration perfect for kindergarten (<https://www.youtube.com/watch?v=75NQK-Sm1YY>)
- "Real Butterfly Metamorphosis Time Lapse" - Actual footage of a caterpillar transforming inside a chrysalis, great for observation skills (<https://www.youtube.com/watch?v=ocWgSgMGxOc>)