

## Photo Description



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

## Scientific Phenomena

This image shows the metamorphosis anchoring phenomenon, specifically the pupal stage of a butterfly or moth's life cycle. The caterpillar has formed a protective casing called a chrysalis where its body completely transforms into an adult butterfly through a process called metamorphosis. Inside this green shell, the insect's tissues are breaking down and reorganizing to form wings, antennae, and other adult body parts. This transformation typically takes 1-2 weeks depending on the species and environmental conditions.

## Core Science Concepts

1. Life Cycles: All animals go through predictable stages of growth and development from birth to death
2. Metamorphosis: Some animals undergo complete transformation during their life cycle, changing their body structure dramatically
3. Adaptation: The chrysalis provides protection from predators and weather while the vulnerable transformation occurs
4. Camouflage: The green color helps the chrysalis blend in with plant surroundings for protection

### Pedagogical Tip:

Use real chrysalises or butterfly gardens in your classroom to allow students to observe this process firsthand. The transformation typically takes 7-14 days, making it perfect for classroom observation and daily journaling.

### UDL Suggestions:

Provide multiple ways for students to document observations - drawing, photography, verbal descriptions recorded on devices, or physical models. This supports different learning preferences and abilities while maintaining scientific rigor.

## 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 like wings, legs, and reproductive organs while the old caterpillar tissues dissolve
2. Zoom Out: This metamorphosis is part of a larger ecosystem where adult butterflies will pollinate flowers, helping plants reproduce and maintaining the balance of the food web

### Discussion Questions

1. What do you think is happening inside the green chrysalis? (Bloom's: Analyze | DOK: 2)
2. Why might the chrysalis be green instead of bright red or yellow? (Bloom's: Evaluate | DOK: 3)
3. How is a chrysalis similar to and different from an egg? (Bloom's: Analyze | DOK: 2)
4. What would happen if we opened the chrysalis to peek inside? (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 totally different form
2. Misconception: All insects make chrysalises  
Reality: Only butterflies make chrysalises; moths make cocoons, and many insects don't transform this way at all
3. Misconception: The chrysalis is like a house the caterpillar lives in  
Reality: The chrysalis IS the caterpillar - it's the transformed outer skin of the insect during metamorphosis

### Cross-Curricular Ideas

1. Math - Counting & Measurement: Students can measure the length of chrysalises using non-standard units (like paperclips or blocks) and create a graph showing how many chrysalises are found at different locations around the playground or garden. This connects to measurement standards while reinforcing data collection skills.
2. ELA - Life Cycle Sequencing & Writing: Students can arrange picture cards showing the four stages of butterfly life cycle (egg, caterpillar, chrysalis, butterfly) in order, then write or dictate simple sentences about what happens at each stage. This builds sequencing skills and early writing abilities.
3. Art - Color & Camouflage: Students can create their own chrysalises using green paper, paint, or natural materials, then discuss why green is a good color for hiding. They could also paint or draw what they imagine is happening inside the chrysalis, expressing their understanding through art.
4. Social Studies - Plant & Animal Habitats: Students can research and discuss what plants butterflies need to live (milkweed, flowers, trees) and create a simple map or collage showing a butterfly habitat. This connects to understanding how communities and ecosystems support different living things.

### STEM Career Connection

1. Entomologist - A scientist who studies insects like butterflies and caterpillars. Entomologists observe how insects live, grow, and change. They might work in museums, universities, or gardens to help protect butterflies and learn about their life cycles. Average Salary: \$65,000/year
2. Botanist - A scientist who studies plants and flowers that butterflies need for food and laying eggs. Botanists work in gardens, farms, and nature centers to grow and protect the plants that insects depend on to survive. Average Salary: \$64,000/year
3. Zoo or Aquarium Educator - A person who works at zoos, nature centers, or butterfly gardens teaching visitors about animals and their life cycles. They care for chrysalises and butterflies, help visitors observe the metamorphosis process, and answer questions about how insects grow and change. Average Salary: \$35,000/year

### NGSS Connections

- Performance Expectation: 2-LS4-1 - Make observations of plants and animals to compare the diversity of life in different habitats
- Disciplinary Core Ideas: LS1.B - Growth and Development of Organisms
- Crosscutting Concepts: Patterns - Observable patterns in nature guide organization and classification

### Science Vocabulary

- \* Chrysalis: The hard shell that protects a caterpillar while it changes into a butterfly
- \* Metamorphosis: The process when an animal completely changes its body form as it grows
- \* Larva: The caterpillar stage of a butterfly's life before it makes a chrysalis
- \* Pupa: The stage when an insect is inside its chrysalis or cocoon changing into an adult
- \* Life cycle: All the stages an animal goes through from birth to death

### 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