

## Photo Description



Two cocoons hang from a building. One cocoon is brown and looks old. The other cocoon is bright green and looks new. These are butterfly cocoons where caterpillars change into butterflies.

## Scientific Phenomena

This image shows the Anchoring Phenomenon of metamorphosis - specifically the pupal stage where caterpillars transform into butterflies inside protective cocoons (chrysalises). The green chrysalis represents an active transformation stage where the monarch caterpillar's body is completely reorganizing its tissues, organs, and structure to become a butterfly. The brown chrysalis appears to be either newly emerged (empty) or in the final stages before emergence. This dramatic change happens through a process called complete metamorphosis, where special groups of cells called imaginal discs direct the formation of adult butterfly features.

## Core Science Concepts

1. Life Cycles: All living things go through changes as they grow from babies to adults
2. Animal Needs: Animals need safe places to grow and change, like caterpillars using cocoons for protection
3. Animal Structures: The hard shell of the cocoon protects the soft caterpillar inside while it changes
4. Time and Change: It takes time for animals to grow and change into their adult forms

### Pedagogical Tip:

Use real monarch chrysalises or high-quality models alongside this photo to help students make concrete connections. First graders learn best when they can touch and examine objects while discussing the concepts.

### UDL Suggestions:

Provide multiple ways for students to express their understanding: drawing the life cycle stages, acting out the metamorphosis process with their bodies, or creating a simple sequence chart with pictures and words.

## Zoom In / Zoom Out

1. Zoom In: Inside the green cocoon, special cells are breaking down the caterpillar's body parts and building new butterfly parts like wings, antennae, and a long tongue for drinking nectar.
2. Zoom Out: These monarch butterflies will join millions of others in an amazing journey that can travel thousands of miles to find warm places for winter, connecting ecosystems across North America.

## Discussion Questions

1. What do you think is happening inside the green cocoon? (Bloom's: Analyze | DOK: 2)
2. Why might caterpillars need a hard shell around them while they change? (Bloom's: Evaluate | DOK: 3)
3. How are these two cocoons the same and different? (Bloom's: Analyze | DOK: 2)
4. What do you predict will come out of the green cocoon? (Bloom's: Apply | DOK: 2)

## Potential Student Misconceptions

1. Misconception: The caterpillar just grows wings inside the cocoon  
Clarification: The caterpillar's body completely changes - it's like melting down and rebuilding into a totally different animal
2. Misconception: All cocoons look the same  
Clarification: Different butterflies and moths make different types and colors of cocoons based on their species
3. Misconception: The change happens quickly overnight  
Clarification: It takes about 1-2 weeks for the complete change to happen inside the cocoon

## NGSS Connections

- Performance Expectation: 1-LS1-2. Read texts and use media to determine patterns in behavior of parents and offspring that help offspring survive
- Disciplinary Core Idea: 1-LS1.B - Growth and Development of Organisms
- Crosscutting Concept: Patterns

## Science Vocabulary

- \* Cocoon: A protective shell where a caterpillar changes into a butterfly
- \* Caterpillar: The young form of a butterfly that looks like a worm
- \* Metamorphosis: The big change when a caterpillar becomes a butterfly
- \* Life cycle: All the stages a living thing goes through as it grows up
- \* Chrysalis: The special name for a butterfly's cocoon

## External Resources

### Children's Books:

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

### YouTube Videos:

- "Monarch Butterfly Metamorphosis Time Lapse" - Shows real footage of the complete transformation process (<https://www.youtube.com/watch?v=ocWgSgMGxOc>)
- "Life Cycle of a Butterfly for Kids" - Animated explanation perfect for young learners (<https://www.youtube.com/watch?v=6Wd0nfAloCs>)