# Life Cycle Stage of Monarch Butterfly

Kindergarten

Life Science | Lesson Guide

## Photo Description

Two cocoons hang from a building corner. One cocoon is brown and looks old. The other cocoon is green and shiny. These are butterfly cocoons that will open soon.

## Scientific Phenomena

This image shows the Anchoring Phenomenon of metamorphosis - specifically the pupal stage of butterfly development. The green chrysalis represents an active transformation stage where a caterpillar is changing into a butterfly through complete metamorphosis. The brown structure appears to be an older, possibly emerged chrysalis or a different type of pupal case. This phenomenon occurs because insects undergo dramatic physical changes controlled by hormones, allowing them to transform from one life stage to another with completely different body structures and functions.

## Core Science Concepts

1. Life Cycles: All living things go through stages of growth and change from birth to death
2. Metamorphosis: Some animals completely change their body shape as they grow (caterpillar !' chrysalis !' butterfly)
3. Animal Needs: Animals need safe places to grow and change, like these protected cocoons
4. Observable Changes: We can see differences in living things over time by watching and comparing

**Pedagogical Tip:**

Use real chrysalis specimens or high-quality photos alongside this image to help students make concrete observations. Encourage students to use their senses (except taste!) and drawing to document what they notice.

**UDL Suggestions:**

Provide multiple ways for students to express their observations - through drawing, verbal descriptions, acting out the life cycle, or using manipulatives. Some students may better understand the concept through movement and kinesthetic activities.

## Zoom In / Zoom Out

1. Zoom In: Inside the green chrysalis, special cells are breaking down the caterpillar's body and rebuilding it into butterfly parts like wings, antennae, and long legs. This happens through cellular reorganization that we cannot see from the outside.

2. Zoom Out: This metamorphosis is part of a larger ecosystem cycle where butterflies will emerge to pollinate flowers, helping plants reproduce and maintaining the balance of nature in gardens, parks, and wild spaces.

## Discussion Questions

1. What do you notice that is the same and different about these two cocoons? (Bloom's: Analyze | DOK: 2)
2. What do you think the animal inside needs to stay safe while it changes? (Bloom's: Apply | DOK: 2)
3. How might you feel if you were changing inside a cocoon? (Bloom's: Create | DOK: 3)
4. What other animals do you know that change as they grow up? (Bloom's: Remember | DOK: 1)

## Potential Student Misconceptions

1. Misconception: The caterpillar just grows wings inside the cocoon
   Scientific Clarification: The caterpillar's body actually breaks down and rebuilds into a completely new form

2. Misconception: All baby animals look like smaller versions of their parents
   Scientific Clarification: Some animals like butterflies look very different as babies (caterpillars) than as adults

3. Misconception: The cocoon is the butterfly's permanent home
   Scientific Clarification: The chrysalis is temporary - the butterfly breaks out when it's ready

## Cross-Curricular Ideas

1. ELA - Sequencing Stories: Read The Very Hungry Caterpillar and have students retell the story using pictures in order (first, next, last). Create a classroom caterpillar using sentence strips with one stage on each strip that students arrange in the correct sequence.

2. Math - Counting and Patterns: Count the number of chrysalises in the photo. Create a pattern with green and brown paper cocoons (green, brown, green, brown). Graph student predictions: "Will the butterfly come out this week or next week?"

3. Art - Mixed Media Chrysalis Craft: Students create their own chrysalis using green tissue paper, markers, and paint to decorate paper bags or egg cartons. Display them on a classroom "transformation wall" and track imaginary emergence dates.

4. Social Studies - Habitats and Homes: Discuss where chrysalises are found in nature (gardens, parks, trees). Create a classroom "safe space" for a live chrysalis observation, talking about how we care for living things and protect their homes.

## STEM Career Connection

1. Entomologist (Bug Scientist): An entomologist studies insects like butterflies, caterpillars, and beetles. They watch bugs, draw pictures of them, and learn what they need to be healthy and happy. Some entomologists help protect butterflies so they don't disappear forever!
   - Average Annual Salary: $65,000 USD

2. Zookeeper: A zookeeper takes care of animals at zoos and nature centers, including insects in special exhibits. They feed animals, clean their homes, and make sure they stay healthy and safe—just like we're doing by observing this chrysalis!
   - Average Annual Salary: $32,000 USD

3. Plant Biologist: A plant biologist studies how plants and animals work together, like how butterflies help flowers by moving pollen from flower to flower. They might study which plants butterflies like to visit and lay their eggs on.
   - Average Annual Salary: $68,000 USD

## 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 and Structure and Function

## Science Vocabulary

* Chrysalis: The hard shell where a caterpillar changes into a butterfly
* Metamorphosis: When an animal completely changes its body shape as it grows
* Life cycle: All the stages a living thing goes through from birth to death
* Caterpillar: The larva stage of a butterfly that looks like a worm
* Emerge: To come out of something, like a butterfly coming out of its chrysalis

## 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