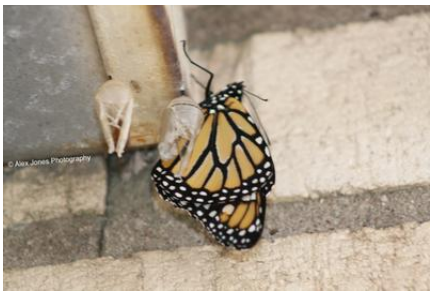
Life Cycle Stage of Monarch Butterfly

3rd Grade

Life Science | Lesson Guide

Photo Description



A monarch butterfly is coming out of its chrysalis case. The butterfly has bright orange wings with black lines and white spots. You can see the empty chrysalis shell that the butterfly lived in while it was changing.

Scientific Phenomena

This image captures the Anchoring Phenomenon of metamorphosis - specifically a monarch butterfly emerging from its chrysalis (eclosion). This is happening because the caterpillar has completed its transformation inside the protective casing. During this process, special chemicals called hormones triggered the caterpillar's body to break down and rebuild into a completely different form with wings, new body parts, and different feeding structures. The butterfly must pump fluid into its wings and let them dry before it can fly.

Core Science Concepts

1. Complete Metamorphosis: Monarchs go through four distinct life stages - egg, larva (caterpillar), pupa (chrysalis), and adult butterfly
2. Structural Adaptations: The butterfly's new body parts (wings, proboscis, antennae) are perfectly designed for its adult lifestyle of flying and feeding on nectar
3. Life Cycle Patterns: This transformation follows a predictable sequence that repeats generation after generation
4. Growth and Development: Living things change in specific ways as they mature, and these changes help them survive in their environment

Pedagogical Tip:

Use actual monarch chrysalises or high-quality videos to help students visualize this process, as many children think the caterpillar simply "grows wings" rather than completely transforming its body structure.

UDL Suggestions:

Provide multiple ways to represent the life cycle including tactile models, digital animations, and student drawings to accommodate different learning preferences and abilities.

Zoom In / Zoom Out

Zoom In: Inside the chrysalis, the caterpillar's tissues break down into a nutrient-rich soup, while special clusters of cells called imaginal discs use this material to build entirely new body parts like wings, reproductive organs, and a long tongue for sipping nectar.

Zoom Out: This individual butterfly is part of an incredible multi-generational migration pattern spanning thousands of miles across North America, with some generations traveling from Mexico to Canada and back, playing crucial roles in pollinating plants across entire ecosystems.

Discussion Questions

1. What do you think would happen if a butterfly tried to fly right after coming out of its chrysalis? (Bloom's: Analyze | DOK: 2)

2. How might the butterfly's new body parts help it survive differently than when it was a caterpillar? (Bloom's: Evaluate | DOK: 3)

3. What patterns do you notice in how the butterfly's wings look compared to other monarch butterflies? (Bloom's: Analyze | DOK: 2)

4. Why do you think nature designed butterflies to go through such a big change instead of just growing bigger? (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 butterflies look the same when they come out
   Reality: Different species have unique colors, patterns, and sizes based on their genetics

3. Misconception: The butterfly can fly immediately after emerging
   Reality: The butterfly must pump fluid into its wings and wait for them to dry and harden before flying

NGSS Connections

Performance Expectation: 3-LS1-1 - Develop models to describe that organisms have unique and diverse life cycles but all have in common birth, growth, reproduction, and death.

Disciplinary Core Ideas:
- 3-LS1.B - Growth and Development of Organisms

Crosscutting Concepts:
- Patterns
- Systems and System Models

Science Vocabulary

* Metamorphosis: The process of changing from one form to a completely different form
* Chrysalis: The hard case that protects a caterpillar while it changes into a butterfly
* Eclosion: The moment when a butterfly breaks out of its chrysalis
* Life cycle: The stages a living thing goes through from birth to death
* Adaptation: A special body part or behavior that helps an animal survive

External Resources

Children's Books:
- From Caterpillar to Butterfly by Deborah Heiligman
- Monarch Butterfly by Gail Gibbons
- The Very Hungry Caterpillar by Eric Carle

YouTube Videos:
- "Monarch Butterfly Metamorphosis Time Lapse" - Shows the complete transformation process in accelerated time: https://www.youtube.com/watch?v=ocWgSgmGxOc
- "Butterfly Emerging from Chrysalis - Real Time" - Captures the actual emergence process as it happens naturally: https://www.youtube.com/watch?v=TJcXRBfkCKM