Life Cycle Stage of Monarch Butterfly

2nd Grade

Life Science | Lesson Guide

Photo Description

A monarch butterfly is coming out of its chrysalis. The butterfly has bright orange wings with black lines and white spots. You can see the empty chrysalis case 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 chrysalis case. Special chemicals called hormones triggered the caterpillar's body to completely reorganize its tissues, organs, and structure to become a flying adult butterfly. This process takes about 8-10 days and represents one of nature's most dramatic examples of complete metamorphosis.

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 form as they grow (egg !' caterpillar !' chrysalis !' butterfly)
3. Structure and Function: The butterfly's new wings, antennae, and body parts have specific jobs that help it survive as an adult
4. Growth and Development: Living things change over time in predictable patterns

Pedagogical Tip:

Use real chrysalises or butterfly gardens in your classroom so students can observe this process firsthand. The excitement of watching emergence happen creates lasting memories and deeper understanding than photos alone.

UDL Suggestions:

Provide multiple ways for students to show their learning: drawing the life cycle, acting out the stages with their bodies, or creating a clay model sequence. This supports different learning styles and abilities.

Zoom In / Zoom Out

1. Zoom In: Inside the chrysalis, special groups of cells called "imaginal discs" use genetic instructions to build completely new body parts. The caterpillar's tissues actually dissolve and get rebuilt into wings, reproductive organs, and other adult structures.

2. Zoom Out: This butterfly emergence connects to larger ecosystem patterns. Monarchs migrate thousands of miles, pollinate plants, and serve as food for other animals. Their life cycle timing matches flower blooming seasons across North America.

Discussion Questions

1. What do you think the butterfly will do first when it comes out? (Bloom's: Predict | DOK: 2)
2. How is this butterfly different from the caterpillar it used to be? (Bloom's: Analyze | DOK: 2)
3. Why might it be helpful for this animal to have such different life stages? (Bloom's: Evaluate | DOK: 3)
4. What other animals do you know that change a lot as they grow? (Bloom's: Apply | DOK: 1)

Potential Student Misconceptions

1. Misconception: The butterfly was always inside the caterpillar, just waiting to come out.
   Reality: The caterpillar's body actually breaks down and rebuilds into completely new structures during metamorphosis.

2. Misconception: All animals change this dramatically as they grow.
   Reality: Only some animals (like butterflies, frogs, and beetles) go through complete metamorphosis. Most animals grow gradually without major body changes.

3. Misconception: The chrysalis is like a cocoon that the caterpillar spins.
   Reality: Moths make cocoons from silk, but butterfly caterpillars form a hard chrysalis case from their own skin.

Cross-Curricular Ideas

1. Math - Counting & Patterns: Have students count the black lines and white spots on the monarch's wings. Create a simple pattern activity where students color paper wings following the monarch's pattern (orange, black line, white dot, repeat). This reinforces counting, one-to-one correspondence, and pattern recognition.

2. ELA - Life Cycle Story Writing: Students dictate or write simple sentences about each stage of the butterfly's life cycle: "The egg is tiny. The caterpillar eats leaves. The chrysalis is hard. The butterfly flies." This builds sequencing skills and narrative writing foundations while reinforcing science vocabulary.

3. Art - Mixed Media Chrysalis Craft: Students create a 3D chrysalis using paper towel tubes, tissue paper, and paint. Then they create a butterfly from coffee filters, markers, and pipe cleaners to display "emerging" from their chrysalis. This combines fine motor skills with scientific understanding of the metamorphosis process.

4. Social Studies - Monarch Migration Map: On a simple map of North America, trace the monarch butterfly's migration route from Mexico to Canada. Discuss why butterflies might travel to find food and lay eggs, connecting to basic concepts of movement and environmental needs.

STEM Career Connection

1. Entomologist (Insect Scientist): An entomologist is a scientist who studies insects like butterflies, ants, and beetles. They observe how insects live, grow, and change. They might work in museums, gardens, or laboratories to help protect butterflies and other insects from disappearing. Average Salary: $65,000 USD per year

2. Butterfly Farmer/Conservationist: Butterfly farmers raise butterflies in special gardens and facilities, just like the one in your classroom! They care for caterpillars and chrysalises, help them emerge safely, and sometimes release them into nature to help pollinate plants and keep ecosystems healthy. Average Salary: $48,000 USD per year

3. Nature Photographer (like the photo creator!): A nature photographer takes beautiful pictures of animals, insects, and plants in their natural habitats or during special moments like butterfly emergence. These photos help scientists study animals and teach people about nature. Average Salary: $55,000 USD per year

NGSS Connections

- Performance Expectation: 2-LS4-1 - Observe plants and animals to compare the diversity of life in different habitats
- Disciplinary Core Ideas: 2-LS4.A - There are many different kinds of living things in any area, and they exist in different places on land and in water
- Crosscutting Concepts: Patterns - Patterns in the natural world can be observed and used as evidence

Science Vocabulary

* Chrysalis: The hard case where a caterpillar changes into a butterfly
* Metamorphosis: When an animal's body completely changes form as it grows up
* Emerge: To come out of something
* 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
* Adult: The final grown-up stage of an animal's life

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