

The Life Cycle of Butterflies

Narrative Summary

This unit introduces students to the concept of life cycles by inviting them to investigate one organism—the Painted Lady butterfly (*Vanessa cardui*). During an eight-week period, students observe, record, and describe the metamorphosis from caterpillar to chrysalis and from chrysalis to butterfly. In many cases, they watch the butterfly lay eggs. The butterfly ultimately dies a natural death, thereby completing students' observations of the life cycle. The children compare the life cycle of the butterfly with that of other organisms, an experience that deepens their understanding of the diversity of life and the patterns that characterize animal life cycles.

Science Content

Characteristics of organisms, the life cycle, and organisms in their environment are the focus of this unit. Resource needs for food and habitat are introduced as students observe the stages in the life of the Painted Lady butterfly. As the butterfly emerges, students observe the process, identify the butterfly body parts, and learn how the body parts function. Students focus on, explore, reflect on, and communicate about butterflies and their transformations during their life cycle. Throughout the unit, emphasis is placed on developing observational and recording skills. Read-aloud stories about the discovery and history of silk add to the content of this unit.



Assessment

In a pre-unit assessment, students share their prior knowledge of caterpillars and then draw what they think a caterpillar looks like and how it changes during its life. Matched post-unit assessments give teachers evidence of growth in students' understanding of life cycles, observation skills, and ability to engage in cooperative learning. Throughout the unit, students' drawings and shared observations can be used to assess

their observational skills and understanding of life cycles. Midway through the unit, students are asked to reflect on their own progress and to apply their knowledge of the butterfly's life cycle to life cycles of other organisms. Additional assessments at the end of the unit allow teachers to compare student drawings with similar illustrations done in Lesson 1 and to write a story about the butterfly's life. A teacher's record chart of student progress provides teachers with another method for assessing student products, learning goals, and general skills used in the unit.

Goals for The Life Cycle of Butterflies

In this unit, students observe the life cycle of the Painted Lady butterfly. Through their experiences, they are introduced to the following concepts, skills, and attitudes.

Concepts

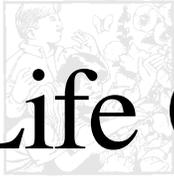
- The different stages of a butterfly's life cycle are egg, larva, caterpillar, chrysalis, and adult.
- Caterpillars need food, air, and space to live and grow.
- The caterpillar forms a chrysalis, and a butterfly emerges from the chrysalis.
- A butterfly needs food to live, but it does not grow after emerging from the chrysalis.
- A butterfly lays eggs, which hatch into larvae.

Skills

- Observing, describing, and recording growth and change in the larva.
- Predicting, comparing, and discussing the larva's appearance and change over time.
- Communicating observations through drawing and writing.
- Relating observations of the butterfly's life cycle to students' own growth and change.
- Extending knowledge of butterflies through reading.

Attitudes

- Developing an interest in studying insects.
- Appreciating the needs of living things.
- Valuing scientific information that has been collected over time.



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Fundamental Concepts and Principles Addressed (K–4)

Science as Inquiry

Abilities necessary to do scientific inquiry

- Ask a question about objects, organisms, and events in the environment.
- Employ simple equipment and tools to gather data and extend the senses.
- Use data to construct a reasonable explanation.
- Communicate investigations and explanations.

Understandings about scientific inquiry

- Scientific investigations involve asking and answering a question and comparing the answer with what scientists already know about the world.
- Scientists use different kinds of investigations, depending on the questions they are trying to answer. Types of investigations include describing objects and organisms and classifying them.
- Simple instruments, such as magnifiers and rulers, provide more information than scientists obtain using only their senses.

Life Science

Characteristics of organisms

- Organisms have basic needs. For example, animals need air, water, and food. Organisms can survive only in environments in which their needs can be met. The world has many different environments, and distinct environments support the life of different types of organisms.
- Each plant and animal has different structures that serve different functions in growth, survival, and reproduction. For example, humans have distinct body structures for walking, holding, seeing, and talking.

- The behavior of individual organisms is influenced by internal cues (such as hunger) and external cues (such as a change in the environment). Humans and other organisms have senses that help them detect internal and external cues.

Life cycles of organisms

- Animals have life cycles that include being born, developing into adults, reproducing, and eventually dying. The details of this life cycle are different for different organisms.
- Plants and animals closely resemble their parents.

Organisms and their environments

- An organism's patterns of behavior are related to the nature of that organism's environment, including the kinds and numbers of other organisms present, the availability of food and resources, and the physical characteristics of the environment.

Science and Technology

Understandings about science and technology

- People have always had questions about their world. Science is one way of answering these questions and explaining the natural world.
- Scientists often work in teams with different individuals doing different things that contribute to the results.
- Tools help scientists make better observations, measurements, and equipment for investigations. They help scientists see, measure, and do things that they could not otherwise see, measure, and do.

Science in Personal and Social Perspectives

Personal health

- Nutrition is essential to health. Students should understand how the body uses food and how various foods contribute to health and growth.

Types of resources

- Resources are things that we get from the living and nonliving environment to meet the needs and wants of a population.
- Some resources are basic materials, such as air and water; some are produced from basic resources, such as food; and some are nonmaterial, such as beauty.

Changes in environments

- Environments are the space, conditions, and factors that affect an individual's and a population's ability to survive.

History and Nature of Science

Science as a human endeavor

- Many people derive great pleasure from doing science.

Unifying Concepts and Processes

Evidence, models, and explanation

Constancy, change, and measurement

Form and function