

A Lovely Captive

Objective

Students will construct a habitat, which will allow them to observe the metamorphosis of a caterpillar into a butterfly.

Background

The name “butterfly” may have come from an ancient belief that these insects were actually fairies that stole butter and milk.

Butterflies and moths are insects belonging to the order “Lepidoptera.” Like all insects, butterflies and moths have three body parts—a head, a thorax and an abdomen. The butterfly’s sense organs are located in its head. These include large, compound eyes for seeing, antennae for smelling and spiral tube-like proboscis for sipping nectar and other liquid. Butterflies have six thin legs for walking and two pairs of wings for flying.

Lepidoptera belong to one of the largest classes of insects, with more than 140,000 species recorded to date. No two species are exactly alike. They do not grow in size but come in a variety of sizes. Lepidoptera live in all but the hottest and coldest of climates. Some live for only a few hours while others live almost a year.

Butterflies are day flyers, since they need the warmth of the sun in order to fly; moths fly at dusk and at night. During the day, moths’ wing patterns provide excellent camouflage as they rest on trees. Most butterflies have more brilliant colors than moths, which are duller and more muted. Butterflies’ bodies are thin while moths’ are thick and hairy to keep them warm at night. Moths have highly-developed, pointed antennae that are feathered or fringed; butterflies’ antennae are simpler and have a knob at the end. Moths rest with wings outstretched; butterflies keep their wings straight up over their backs. Some moths never eat but live on the energy stored from the caterpillar stage.

Lepidoptera serve an important ecological purpose, carrying pollen from plant to plant. This process helps crops produce seeds so there will be new crops the following year.

During its life, a butterfly goes through many different stages of development. It looks different during each stage. This developmental process is called metamorphosis, a Greek word that means transformation.

A butterfly begins its life as an egg. The egg was probably laid on the underside of a leaf. Later it hatches into a caterpillar, or larva. The caterpillar is hungry. It eats leaves and other things. As a caterpillar grows, its skin cracks and slips off. This process may take place four or five times before the caterpillar is fully grown. When a caterpillar reaches its full size, it surrounds itself with a protective case called a chrysalis. This stage is known as a pupa. After a period of time, the case splits open and an adult butterfly emerges. The butterfly looks very different. It has a thin body, wings and six legs.

Oklahoma Academic Standards

GRADE 1

Reading and Writing
Process: R.1,3
Life Science: 1-1,2; 3-1
Visual Art—Creating: 1,2.
Connecting: 4

GRADE 2

Reading and Writing
Process: R.1,3
Life Science: 4-1
Visual Art—Creating: 1,2.
Connecting: 4

GRADE 3

Reading and Writing
Process: R.3
Life Science: 1-1; 3-1
Visual Art—Creating: 1,2.
Connecting: 4

Vocabulary

chrysalis—the pupa of a butterfly or moth; also: the hardened outer layer of such a pupa

cocoon—an envelope usually of silk which the larva of some insects (as moths) forms about itself and in which it passes the pupa stage

Lepidopteran—any of a large order of insects that include the butterflies, moths, and skippers and that as adults have four wings usually covered with minute overlapping often brightly colored scales and as larvae are caterpillars

metamorphosis—the process of basic and usually rather sudden change in the form and habits of some animals during transformation from an immature stage (as a tadpole or a caterpillar) to an adult stage (as a frog or a butterfly)

Edible Caterpillars

bananas

peanut butter

pretzel sticks

raisins

1. Dip the bananas in orange juice to keep them from turning brown
2. Stick pretzels in the sides to make feet and in the top to make antennae.
3. Spread peanut butter on the back and stick raisins in to make the interesting patterns found on most caterpillars.

Materials

- 1 square yard netting
- 2 embroidery hoops, 10 inches in diameter
- 2 rubber bands
- paper plate
- apple or other fruit
- yarn
- pom poms
- clothes pins
- paper towels
- water color paints

English Language Arts

1. Read and discuss background and vocabulary.
2. Hand out the Metamorphosis worksheet and discuss metamorphosis.
 - Students will fold a sheet of paper in half and then fold it again to make four boxes.
 - Students will number the boxes 2-4.
 - Students will answer questions and draw illustrations in the boxes provided.
 - Students will cut out the boxes and glue them in proper sequence into the boxes on the folded sheet of paper.

Science

1. Make a butterfly cage, as follows:
 - Form a cylinder with the netting.
 - Fasten the cylinder about ten inches from each end with the embroidery hoops.
 - Leave a three-inch overlap down the length of the cylinder to serve as a door.
 - Close off both ends with rubber bands.
 - Slide a paper plate through the door.
 - Place the plate on the bottom of the cylinder to serve as a landing platform.
 - In the spring, take students outdoors to gather cocoons.
 - Use the cage for keeping adult butterflies and moths or for emerging cocoons and chrysalises.
 - Tie a slice of apple or other fruit to a piece of yarn and suspend it inside the net for the butterflies to eat.

Visual Art

1. Students will make caterpillars, as follows:
 - Glue pom-poms onto one side of a clothespin.
 - Twist 3-inch pieces of pipe cleaner around top ends to form antenna.
 - Let dry.
2. Students will make butterflies by adding wings to the caterpillars, as follows:

- Lay paper towel flat.
- Use watercolor to paint the towel
- Allow to dry.
- When dry, fan fold the paper towel into 1/2-inch sections.
- Pinch the middle of the wings and clip inside the clothespin

Extra Reading

- Hamilton, Kersten, R., *The Butterfly Book: A Kid's Guide to Attracting, Raising and Keeping Butterflies*, John Muir, 1997.
- Holch, Gregory, *The Things With Wings*, Scholastic, 1999.
- Koch, Maryjo, *Dragonfly, Beetle, Butterfly, Bee*, Smithmark, 1998.
- O'Conner, Jane, *Fancy Nancy, Explorer Extraordinaire*, Harper Collins, 2009.
- Sandved, Kjell Bloch, *The Butterfly Alphabet: Photographs*, Scholastic, 1996.

Name _____

Metamorphosis

Fold a sheet of paper in half. Fold it again. Open. Now you have four boxes. Number the squares 1-4. Answer the questions in the following boxes. Draw a picture for each stage. Cut them out. Glue them onto the boxes you created on the folded paper *in the correct order* to show butterfly life stages. Use words from the reading selection at right below.

After the caterpillar grows, it surrounds itself with a protective case called a _____. This stage is known as _____.

Draw a picture of this stage.

A butterfly's life has several stages. It looks _____ during each stage. The first stage is a tiny _____.

Draw a picture of this stage.

After the case splits open, an adult _____ emerges. It has a thin _____, wings and _____ legs.

Draw a picture of this stage.

After the egg hatches, the second stage begins. The egg hatches into a larva or _____. It eats _____ and other things.

Draw a picture of this stage.

READING PASSAGE

During its life, a butterfly goes through many different stages of development. It looks different during each stage. This developmental process is called metamorphosis, a Greek word that means transformation.

A butterfly begins its life as a tiny egg. The egg was probably laid on the underside of a leaf. Later it hatches into a caterpillar, or larva. The caterpillar is hungry. It eats leaves and other things. As a caterpillar grows, its skin cracks and slips off. This process may take place four or five times before the caterpillar is fully grown.

When a caterpillar reaches its full size, it surrounds itself with a protective case called a chrysalis. This stage is known as "pupa." After a period of time, the case splits open and an adult butterfly emerges. The butterfly looks very different. It has a thin body, wings, and six legs.