

Teacher's Guide

A Butterfly Is Born



EARLY
Science

Investigation and Review

How Are the Four Wings of a Butterfly Alike?

Whole-Class Investigation One of the butterfly's most amazing features is the symmetry of its wings. Invite children to investigate a butterfly's wings more closely, as well as the concept of symmetry.

Materials:

- data sheet (page T18)
- small mirror with a flat side
- crayons or colored markers

Procedure:

Step 1 Gather children around the Big Book, and invite them to take a closer look at the butterfly's wings. Explain that a butterfly's wings are made up of overlapping scales, like the scales on a fish, but much smaller. Thousands of tiny scales give the wings their color.

Step 2 Hold your finger along the middle of a butterfly so each pair of wings is on either side. Ask children what they notice about the wings. Help them realize that the pattern on one side is a mirror image of the pattern on the other side. Explain that a mirror image of something is called symmetry.

Step 3 To prove that the wings have symmetry, demonstrate how to hold a mirror along the middle of the butterfly picture. Ask children to compare the reflection in the mirror with the butterfly's wings. The reflection of the wings completes the butterfly! The wings are a mirror image of each other.

Step 5 Give each child a data sheet. Challenge them to complete the butterfly by drawing a symmetrical pattern (or a mirror image) on the blank wings. Then discuss the questions at the bottom of the page, helping children to answer them.

Data Sheet Answers The pattern is symmetry. Most animals have body symmetry. Examples include all mammals, birds, and reptiles.

Discuss What You've Learned

Discuss with children what they've learned about symmetry and a butterfly's wings.

- *How many wings do butterflies have?* (Two wings on each side of its body.)
- *What are the wings made of?* (Very small overlapping scales.)
- *What is special about the patterns on a butterfly's wings?* (The patterns are a mirror image of each other, or symmetrical.)

Review

Revisit the Big Book

Conclude your lesson of *A Butterfly Is Born* by revisiting the Big Book. Remind children that the Big Book was their introduction to this topic. Review with children what they've learned, and ask them to recall the butterfly's life cycle in order, starting from an egg.

Performance Assessment

Reproduce and distribute the Performance Assessment (page T19). Have children cut out the pictures along the bottom and glue them in the correct order to show the butterfly's life cycle. Challenge children to label each life stage, using the words at the top of the page. Remind children that another word for *pupa* is *chrysalis*.

Extension Activities

The Better to Smell You!

Invite children to study the butterfly pictures in the Big Book. Focus their attention on the butterflies' *antennae* (plural for *antenna*). Point out a few special features, such as the knobs at the tips of the antennae and the small bead-like segments on the antennae. Also, mention that the antennae have thousands of tiny holes. Explain that it is through these holes that the butterfly detects odors!

Write the word *antennae* on the board. Explain that a butterfly's antennae can detect scents of flowers and of other butterflies, sometimes as far as two miles away! Antennae also help butterflies to taste and feel. Have children work in pairs to make their own antennae.

Step 1 Give each child two pipe cleaners, clay, and a narrow strip of paper to serve as a headband.

Step 2 Show children how to make two small clay balls to form the antennae's knobby ends. Help them stick the balls to the end of each pipe cleaner.

Step 3 Help children measure the paper strip so it fits snugly around their heads. Tape the ends together.

Step 4 Now glue or tape the pipe cleaners to opposite ends of the paper-strip headband. Show children how to gently slip on the antennae. Let children have fun imagining that they are butterflies. Invite them to talk about objects they smell, their life cycle, and flowers they like to visit.

Cool Idea! Sip It Up!

Remind children that a butterfly sips nectar from a flower through a straw-like tongue called a proboscis. Explain that when the butterfly isn't using its tongue, the proboscis curls up. Show children a party favor and ask children to describe

it. Then slowly blow into it and have children watch as it slowly uncurls. Explain that when a butterfly is ready to sip, it uncurls its proboscis. You might hand out party favors to the class, along with paper cups to represent flowers. Have children blow into their party favors to uncurl them into the cups, pretending to sip flower nectar as butterflies do.

The Better to Taste You!

Review with children that, like all insects, butterflies have six legs. The six legs are attached to the butterfly's body on the middle part—the *thorax*. Mention that a butterfly's legs are divided into five segments. Explain that the segments are hinged together to make it easy for the butterfly to move.

Then share with children this interesting fact: Butterflies taste with their feet! Explain that the bottom of the butterfly leg has a pad with tiny hairs that taste the flower!

Let children have fun considering what they could taste with their feet. Encourage children first to draw pictures of themselves walking on something and then to describe how that something tastes (for example, a rug, the grass, or even their socks). Have children exchange their creative ideas, comparing the different things they each "tasted."

Think About It!

Tell children that although butterflies use their legs for walking, their legs aren't actually very strong, so butterflies can't walk very far. Explain that butterflies actually have little claws at the end of each leg. Ask children what they think these claws are used for. Confirm that the butterfly's claws help the butterfly grip the flower on which it is standing.

Flying Styles

Share with children that butterflies fly in different ways, depending on the size and shape of their wings. Invite children to act out these two basic methods of butterfly flight.

- As children watch, hold your arms out and explain that you are a butterfly with very large wings. Move your arms slowly up and down and explain that a butterfly with large wings does not move its wings very much. Sometimes the butterfly just flaps its wings once and glides smoothly along on a current of air. Invite children to imitate your slow, gentle arm movements.
- Now bring your arms in so your elbows are touching your sides. Hold out your forearms and flap your arms and hands more quickly. Explain that now you are a butterfly with small wings. These butterflies fly very quickly, but only for short distances. They must move their wings very fast in order to fly. If a butterfly with small wings is frightened, it might flap its wings six hundred times a minute to fly away, moving as fast as thirty miles an hour! Invite children to imitate your quick, rapid arm movements.

Butterfly Jetsetters

Share with children that the monarch butterfly migrates farther than any other butterfly. That means that it travels from one place to another when the seasons change. Groups of millions of monarchs fly south from Canada and the northern United States, some more than twenty four hundred miles, to spend the winter in the mountain forests of Mexico or California. They then return north in the spring.

On your classroom globe or wall map, help children find Canada and the northern United States. Then help them finger-trace the distance all the way down to Mexico. Encourage children to name what states the butterflies might fly over and what sights the butterflies might see.

Think About It!

Ask children what they think butterflies that don't migrate to warmer areas do in winter. Explain that some butterflies *hibernate*, or spend the winter in a deep sleep. Ask children to imagine that butterflies dream while they are hibernating. Encourage them to share ideas for butterfly dreams with the class.

School Flower Garden

Share with children that butterflies are attracted to a number of different plants. Try to set up a small garden outside a classroom window, where children can observe butterflies in action. Suggested flowers include marigolds, black-eyed Susans, crocuses, hyacinths, and a bush called a butterfly bush.

Encourage children to notice the ways in which different butterflies move and hold their wings, especially to hold their bodies over flowers in order to find nectar. Also, have a local butterfly guide on hand and help children identify the butterflies that visit their garden.



Home/School Connection

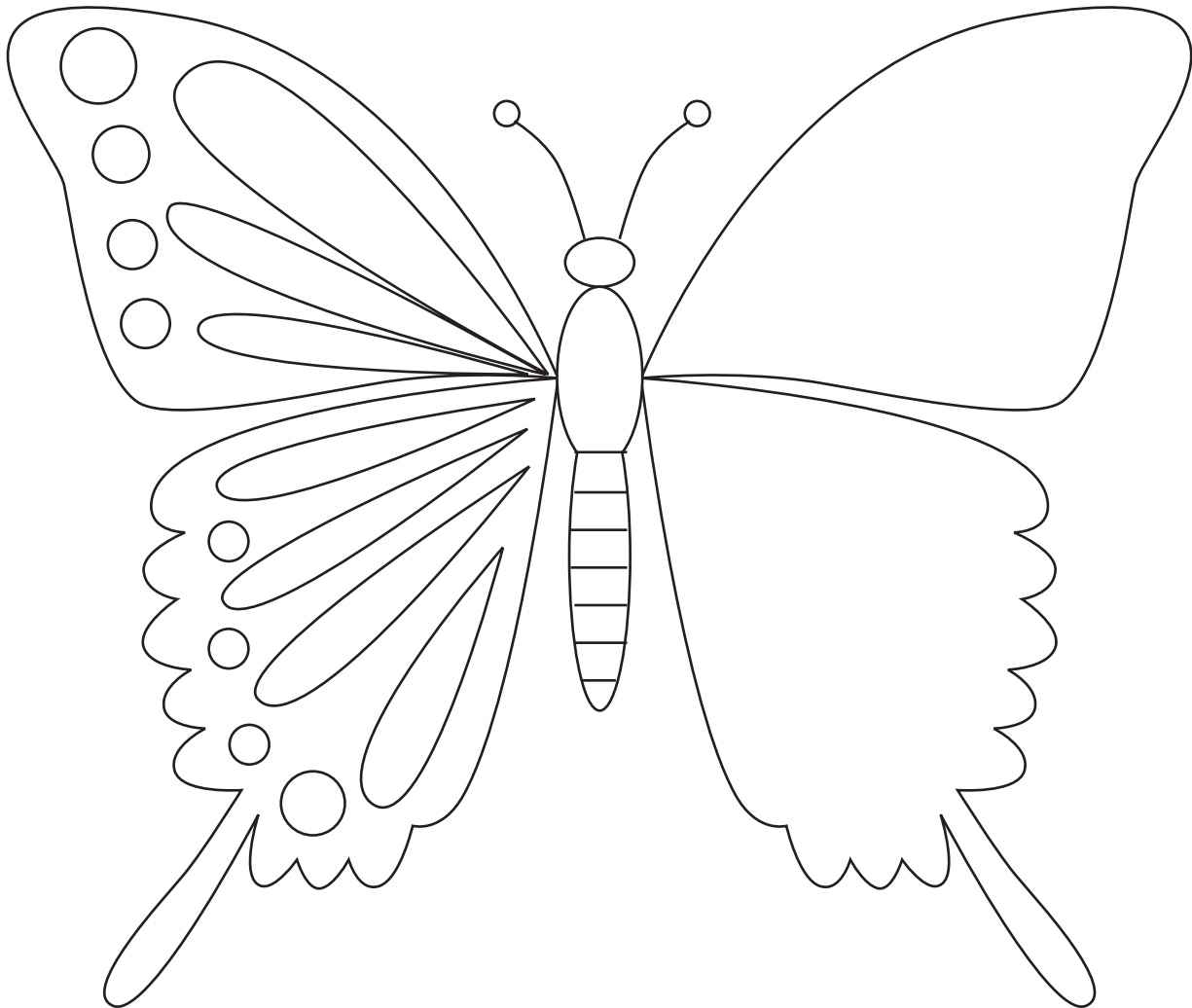
Encourage children to share with their families what they've learned about butterflies. Let them take home their data sheets from the whole-class investigation and explain symmetry.

If the season is right, suggest that children look for butterflies around their home, with an older family member accompanying them. Let children draw a butterfly that they see. Alternatively, they may research butterflies from reference sources. In class, have children share their findings.

Name _____ Date _____

How Are the Four Wings of a Butterfly Alike?

Look at the butterfly's wings. What should the wings on the right side look like? Draw them.



What is the pattern of a butterfly's wings called? _____

What other animals have this kind of pattern? Draw one on the back of this page.