

STEM ACTIVITY OF THE WEEK



Life of a Butterfly

Theme: Butterflies, Life Cycles, Insect Anatomy, Form and Function

Ages: 5-8 years old

Prep Time: 5 minutes

Activity Time: 20-30 minutes

Activity Summary:

Hudson River Park is home to a variety of butterflies within its four miles of lush plant beds and gardens. Monarch butterflies in particular are seen throughout the summer and early fall especially in the Park's native plant Habitat Garden, a monarch butterfly waystation. Monarchs are a unique species in that they migrate thousands of miles south every fall to escape cold temperatures. Additionally, the caterpillars rely solely on the milkweed plant for nutrients and survival. This lesson breaks down the life cycle of a butterfly and invites young students to reenact each stage. Students will also review the general anatomy of a butterfly and craft their own butterfly using common household items.

Objectives:

- Students will identify the four stages of a butterfly's life cycle
- Students will identify the basic anatomy of a butterfly

Lesson Materials:

- Monarch Butterfly Life Cycle worksheet
- Butterfly Anatomy worksheet

Craft Materials:

- Basket coffee filter or paper cut in a circle (approx. 10-inch diameter)
- Clothespin, toilet paper tube or popsicle stick
- Markers or paint
- (4) 12-inch pipe cleaners, wire or foil
- Tape
- Sharpie or pen
- Spray bottle with water (optional)
- Glitter glue or other decoration materials (optional)

Lesson Procedure:

1- The Butterfly Life Cycle

Educator Note: Use the Butterfly Lifecycle Wheel worksheet as a guide or use a blank sheet of paper to complete this activity. Let the student begin by naming the first stage of life (egg) and draw each proceeding stage as described below in a clockwise direction with arrows connecting each stage. Afterwards, review each stage by acting out what each stage looks like with the student. Have colorful scarves and a blanket or sheet handy.

Sample Narrative to teach:

Butterflies have a unique life cycle. Can you tell me what a life cycle is? (The different stages in an organism's life) or What are the different stages that make up our life cycle? (Embryo- or in our mom's tummy, baby, kid/teenager, adult) From Baby to Adult, humans grow and get bigger, but our body parts stay pretty much the same—we have a head, torso, two arms and legs, hands and feet, etc. Butterfly stages of life are very different! Monarch butterflies are found in Hudson River Park during the warmer months as a stopover habitat during their migratory journey between Mexico and Canada.

First, they start out as an **egg**. Monarchs lay their eggs exclusively on milkweed plants and about four days later, they hatch.

STEM ACTIVITY OF THE WEEK

After they hatch, they become a larva, or a **caterpillar**. The baby caterpillar eats the milkweed plant it hatched on, so that it can gain strength for its next phase. Milkweed tastes bitter and unpleasant to most other animals; eating milkweed is a defense strategy for Monarch caterpillars because it makes them taste bitter too!

About two weeks after hatching, the larva is strong enough to mature, and it becomes a pupa, or **chrysalis**. This means the caterpillar is ready to find a safe place on the underside of a milkweed leaf to attach itself and begin the process of metamorphosis. Using silk, the caterpillar will attach to the base of a stem or a leaf and create a casing around its body called a chrysalis. For ten days it might look like nothing is happening but this is actually the phase where the most change occurs. Inside the chrysalis, the caterpillar is transforming into a butterfly! This transformation is called metamorphosis.

After this remarkable change of metamorphosis happens inside the chrysalis, the adult **butterfly** is ready to emerge! The butterfly exits the chrysalis looking remarkably different, with bright colorful wings and a long slender body shape.

Now that we know all of the stages, let's act out each stage with our bodies! What does a butterfly egg look like? They are really small and round like a ball, let's crouch down turn into an egg that is waiting to hatch on a leaf. What happens after a few days? That's right, we hatch out of our eggs and crawl like a caterpillar. We have to eat lots of milkweed leaves to grow big and strong. Now that we've grown, we are ready for the next stage, what is it? The chrysalis! Let's wrap ourselves into a sheet or blanket while we go through the process of metamorphosis. Next, with colorful scarves as wings, we can finally emerge as a beautiful, adult butterfly and spread our wings!



2- Learning Butterfly Anatomy

Educator Note: Start with the Butterfly Anatomy worksheet or by drawing a slender oval on paper. Let the student name a particular part of a butterfly, discuss its function, then label and color on the worksheet or draw onto the oval. Help guide them to add all of the body parts listed below and use clues to guess and discuss the function of each part. To see where each body part should be placed, view the Butterfly Anatomy Worksheet Answer Key.

Head: there are different features on the head

- **Antenna** for feeling
- **Compound eyes** (creating many different images that the butterfly can process all at once) for seeing from different angles at once. Students hold up a finger about a foot in front of their face and close one eye and then the other- demonstrating how we process two images. Then explain that butterflies have this but up to 17,000 times more!
- **Proboscis** or straw like mouth for sucking up nectar

Thorax: the chest/torso

- **Legs** (three on each side) for stabilizing when landing on a flower or leaf

STEM ACTIVITY OF THE WEEK

- **Wings** for flying, camouflaging and retaining heat

Abdomen: this is where the butterfly's heart and most of the digestive system is located

Sample Narrative to teach:

This is my friendly butterfly – but does it look like a butterfly? No, this poor butterfly is missing all of its parts! Can you think of some body parts that its missing so we can help? (Student starts to name body part) Great the butterfly needs eyes! A butterfly has compound eyes, let's label and color in the compound eyes together on our worksheet. Why doesn't a butterfly have just two eyes like humans? (to see from different directions all at once).

Educator Note: After adding all of the body parts to the butterfly, you can also use the Butterfly Anatomy Worksheet Answer Key to extend learning and recap these new vocabulary words.

3- Make your own Butterfly!

Educator Note: Putting together the knowledge of butterfly anatomy, it's time to make your own using common craft items you have at home! Feel free to use alternative materials to construct and decorate your butterfly.

- Step 1: Color the coffee filter with markers, paint, water colors etc. to decorate the "wings." Optional: gently spray water and watch the colors from the marker soften and merge together, then let dry.
- Step 2: Once dried, fold the coffee filter in alternating 1-inch sections to create a fan-like effect.
- Step 3: On the "head" of the clothespin, draw compound eyes with marker or a pen. Outline or color sections of the head, thorax and abdomen. If you don't have a clothespin, try using a bag clip, toilet paper tube or popsicle stick.
- Step 4: Pinch the center of the folded coffee filter and insert into the clothespin. Gently unfold the coffee filter on each side of the clothespin.
- Step 5: Cut pipe cleaner into 3, 6-inch pieces and keep one 12 inch pipe cleaner to the side. Clip the clothespin at the center of the three pieces of pipe cleaner and bend them downward to make "legs." Secure with tape as needed.
- Step 6: Wrap the 12 inch pipe cleaner around the base of the "head" and curl the ends on each side to create "antennae."

Craft Examples;



STEM ACTIVITY OF THE WEEK



4- Sing a Song – Head, Thorax, Abdomen!

Educator Note: Sing to the tune of the “Head, Shoulders, Knees and Toes” theme song and review the parts of the butterfly by miming through the words!

Head, thorax, abdomen, abdomen,

Head, thorax, abdomen, abdomen,

Compound eyes, antenna, and six legs,

Head, thorax, abdomen, abdomen!