

Monarch Life Cycle Sort

Session Time:
30 minutes

Number of Participants:
any

Materials Needed:

• copies of the Monarch Life Cycle cards - one set per 2-3 students. Laminate cards if possible.

Objectives:

Participants will:

1. Learn about animal life cycles by focusing on the monarch butterfly.
2. Learn that some insects go through complete metamorphosis which includes many stages including a “resting” stage.

Background

All live creatures change as they grow. A puppy is born with its eyes and ears closed, very little hair and are unable to walk. A mother opossum gives birth only 14 days after mating - the shortest gestation of any North America mammal. The tiny baby opossums - only the size of a grain of rice - crawl to their mother’s pouch where they continue to grow. A eaglet (baby eagle) is only 4 inches when it hatches and is unable to fly or hunt. And a frog begins its life as an egg only to emerge as a tadpole with out legs and unable to live outside water.

And, although all living creatures change as they grow, some species undergo only slight changes while others experience dramatic transformations.

Most insects undergo a process called metamorphosis. The term “metamorphosis” means “change” and refers to the changes that insects go through as they grow. There are two kinds of insect metamorphosis - complete and incomplete.

Incomplete metamorphosis has three stages: egg, nymph and adult. Examples of insects which go through incomplete metamorphosis include crickets, grasshoppers, preying mantis, dragonflies and mayflies. When in the naiad or nymph stage, the insect will often go through several growing stages known as instars (3-6 instars are common). Between each growth or instar stage, the insect will shed its skin. Finally, after the last molt, the nymph will become an adult able to reproduce.

Complete metamorphosis has four stages: egg, larvae, pupa, adult. Examples of insects which go through complete metamorphosis include butterflies, moths, beetles, ants, flies, wasps and bees. When an egg hatches, the insect is in the larvae stage. While in the larvae stage, the insect will go through several growing or instar stages. Between each instar stage, it will shed or molt its skin. After the final molt, the insect will go into the pupa or resting stage. During this stage, the insect transforms into its adult stage. Insects emerge from the pupa stage as adults ready to reproduce.

Monarch butterflies are classified into the complete metamorphosis category with their recognizable green, white and yellow striped caterpillar and easily identified black and orange adult. But, if we take a closer look at the monarch’s life cycle, we see that it is more complex than that.

Procedure

Before the Activity

• Print copies of the Monarch Life Cycle Cards (set of 11). Print one set per 2-3 students. Or, if you are planning to have this activity at an individual learning station, print one copy. Laminate cards if possible.

During the Activity

1. Explain to students that all living things change as they grow. When investigating insects, we refer to this life cycle changes as “metamorphosis.” There are two forms of metamorphosis - incomplete and complete.

Describe the differences between complete and incomplete metamorphosis.

2. Ask students which kind of metamorphosis they think a butterfly completes?

3. Explain that butterflies - like the monarch butterfly - go through complete metamorphosis. This means that a butterfly has four life stages - egg, larvae, pupa and adult. But, in reality, there are more steps than just four.

4. Provide students with the cards. Ask students to place the cards in the proper order.

**NOTE: for pre-school students, you may want to eliminate some cards and have only the egg, one caterpillar, pupa and adult cards.*

5. Once students have placed the cards in the order, ask groups to compare their cards. Did all groups have the cards in exactly the same order. If not, what differences are there. Ask students to discuss any differences. Students should take turns discussing their rationale about the order of the monarch’s life cycle.

Wrap-up & Evaluation

Ask students to draw the life cycle of the monarch.

**NOTE: for pre-school children, have them draw only the four main stages - egg, larvae (caterpillar), pupa (chrysalis) and adult.*

Have students research the habitat needs of monarch caterpillars and adult butterflies. What similarities are there? What differences are there?

Extensions

• Have students design a habitat for the caterpillars. Be sure to have students think about the entire life cycle of the insect - what needs will the caterpillar have? What needs will the adult have? How can one habitat have resources for both the caterpillar and adult.

After students have designed their habitat, ask them to actually build it. Then, purchase live monarch caterpillars (Monarch Watch, monarchwatch.org). Place the caterpillars in the habitat and watch them grow and change into butterflies.

• Purchase live monarch caterpillars (Monarch Watch, monarchwatch.org). Place caterpillars in a habitat that students can see throughout the day. Ask students to record the changes they see in the insect over time. Students may want to take one picture of the insect each day.

Websites

• Monarch Watch

www.monarchwatch.org

• Monarch Lab

monarchlab.org

• U.S. Forest Service: Monarch Butterfly

http://www.fs.fed.us/wildflowers/pollinators/Monarch_Butterfly/index.shtml

• Journey North: Monarch Butterfly

www.learner.org/jnorth/monarch

Monarch Life Cycle Sort

ANSWERS



Stage 1: egg



Stage 2: caterpillar
Instar 1



Stage 3: caterpillar
Instar 2



Stage 4: caterpillar
Instar 4



Stage 5: caterpillar
Instar 4



Stage 6: caterpillar
Instar 5



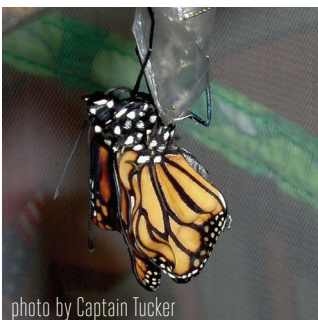
Stage 7: beginning
to form chrysalis



Stage 8: pupa stage,
chrysalis



Stage 9: pupa,
nearing end of stage



Stage 10: adult
emerging from chrysalis



Stage 11: adult



photo by B. F. Page



photo by Sheri Fox, The Unfettered Fox



photo by Julie Simpson, juliesbutterflies.com



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photo by Todd Stout, raisingbutterflies.org



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