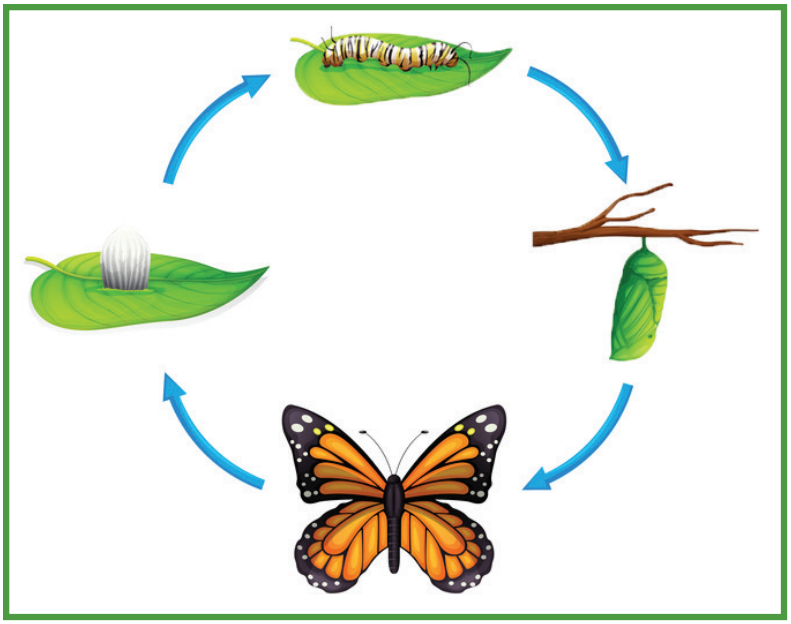
NATIONAL GEOGRAPHIC
THE GREAT NATURE PROJECT

BUTTERFLY MISSION

Explore the life cycle of butterflies and moths in your neighborhood. Learn how they interact with their habitat.



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Mission Overview

Get outside with family and friends to explore butterfly and moth life cycles. Use the background information and the tasks to learn about caterpillars, moths, and butterflies. Let your discoveries ignite conversations about life cycles and habitats in your neighborhood. Share the photos you take with **greatnatureproject.org** or by using the mobile app from **iNaturalist.org**. If you find organisms that you cannot identify, be sure to select identification help so that other nature enthusiasts can help you and learn more about what you have discovered. Children under the age of 13 should submit ovservations with adult supervision in order to protect their privacy.

This mission should be completed in the spring or summer when butterflies are present in your area.

Background Information

Butterflies and moths belong to a group of insects called Lepidoptera. All Lepidopterans go through life stages as eggs, larva (caterpillars), pupa (chrysalises or cocoons), and winged adults. Eggs are usually laid on host plants, which are the specific kinds of plants eaten by a caterpillar species. For example, monarch butterflies lay their eggs on milkweed. Caterpillars molt several times before turning into a chrysalis or cocoon. After a period of time (which varies by species), an adult butterfly or moth emerges from the pupa. Adults can only drink liquid such as nectar from flowers or water from wet soil (a behavior known as puddling), but they are usually not as limited as caterpillars in what they eat. For example, monarch caterpillars only eat milkweed or closely related species, but adult monarchs drink nectar from dozens of flower species. Butterflies are important pollinators of plants because they move pollen from one plant to another while foraging for nectar. Male and female butterflies mate, and females lay the next generation of eggs beginning the life cycle again.

Your **mission** is to find caterpillars, moths, and butterflies in your neighborhood. Take pictures of the insects and the plants they eat!

HOW TO PARTICIPATE

1. Go outside and search for the organisms described in each task. You may not be able to find them all in one excursion.

2. Upload your photos to the Great Nature Project on **greatnatureproject.org** or by using the **iNaturalist.org** mobile app.

3. Be sure to use the "look up" button (or magnifying glass icon in the app) to search for the appropriate group of organisms (such as "butterflies" or "grasses"). Then others in the community can help suggest identifications.

4. Use the questions and discussion ideas to dive deeper into this learning adventure. Kids ages five to 11 will find varying level of success for tasks 1-5. Older kids and families can challenge themselves to complete all tasks.

(left) Robert Sisson/National Geographic Creative; (middle) Emory Kristof/National Geographic Creative; (right) Olivier Le Queinec | Dreamstime

CHECKLIST

Task 1: Take a picture of a caterpillar.
Ask: *Can you describe how it looks? Does it blend in with its surroundings or stand out? Is it fuzzy? Is it striped? Does it have false eyes (spots on its body that look like eyes)? Does it have antennae?*
(Answers will vary.)

Task 2: Take a picture of a plant a caterpillar is eating. Be sure to include clear photos of leaves and flowers, if it has them.
Ask: *What does the plant look like? Describe its leaves, flowers, and other noticeable features. Is the plant wild or was it planted there intentionally?*
Note: If you are able to identify the plant on your own or with help from the iNaturalist community, you will have a better chance at properly identifying the caterpillar species.

Task 3: Take a picture of a butterfly.
Ask: *What are some of the most noticeable features of this butterfly? Describe its shape, size, patterns, and color. What habitat did you find it in? What is the butterfly doing? Is it flying? Eating? Mating? Resting?*
(Answers will vary.)

Discussion idea: Explain that when you try to identify an organism it is important to take note of all of its features and its habitat, not just its color. All of these features are identification clues.

Task 4: Take a picture of a butterfly eating. Look for its proboscis (tongue) protruding and probing.
Ask: *What is the butterfly eating?*
(Answer: Most butterflies and moths eat nectar from plants.)

Discussion idea: Like hummingbirds, butterflies are attracted to colorful flowers, which are a plant's signal to pollinators that it has nectar and pollen. The butterfly then lands on a flower and uses its proboscis to sip the nectar. When they move from one flower to another, butterflies transfer plant pollen from plant to plant making them pollinators. Pollination is important because it is necessary for plants to make seeds.

Task 5: Take a picture of moth. (Hint: You will likely need to go on a dusk or nighttime adventure to complete this task. You can often find moths attracted to an outdoor light such as a porch or security light.)
Ask: *What are some differences between butterflies and moths?*
(Answer: Butterflies tend to be more colorful and are active during the day. Moths are less colorful and are active at night. The best way to tell a moth and butterfly apart is to look at the antennae. Butterfly antennae are smooth and are shaped like a golf club at the tip. Moth antennae taper off at the end without a "club," or may look furry orfeathery.)

Task 6: Take a picture of a butterfly or moth egg. Using a magnifying glass or hand lens helps.
Ask: *Where should we look for butterfly or moth eggs?*
(Answer: Different species lay their eggs in different places, but mostly on plants. Some lay eggs on top, others below, and some on stems. If you saw a caterpillar on a plant, you can search that same plant for eggs. You can read about the caterpillar diet of a particular species to narrow your search, or read about species you might find on plants that grow nearby. This is a tough task, but it will make the discovery even more exciting!)

Task 7: Take a picture of an animal eating a butterfly. You may have to observe patiently.
Ask: *What predators do you think butterflies have?*
(Answer: Butterflies are eaten by other insects as well as birds and reptiles. Some species of butterflies are toxic when eaten. Animals learn to avoid eating those species. Other species of butterflies have evolved to mimic (or pretend to look like) the toxic butterflies, which helps them avoid being eaten.)

Task 8: Take a picture of a chrysalis or a cocoon. They are often camouflaged and/or hidden, so this will take careful observation
Ask: *What is the difference between a chrysalis and a cocoon?*
(Answer: A chrysalis is made from hardened protein. Butterfly caterpillars make chrysalises. Moth caterpillars make a cocoon by spinning silk.)

COMPLETING YOUR MISSION

Be sure to submit your photos to **greatnatureproject.org**. Remember, it's fine if you don't know what you saw. Record as much as you know (e.g. "moth" or "swallowtail") and then others in the Great Nature Project can help suggest identifications.

As you are walking home, talk about what life stages of a butterfly or moth you saw.

- Discuss the importance of these insects and why we need to protect them. Humans can help butterflies and moths by planting butterfly gardens with native plants and by avoiding the use of pesticides.

- Discuss the new things you learned about butterflies and moths.

  Explain two new things you learned.

  What surprised you most?

  What do you want to research more about?

Art Project Extension

Create an art project that depicts the life cycle of a species of butterfly or moth that occurs in your neighborhood. Encourage younger kids to draw all of the stages in a butterfly's life. Older kids should try to draw and label each stage.

! *Challenge:* *Design your own butterfly or moth.*
Get creative with the color, pattern, and antenna shape.
Explain why your butterfly or moth looks like it does.