



Exploring 4-H at Home



Environment & Healthy
Living

Pillar: Environment & Healthy Living

Project: Entomology

Activities: Butterflies



CANADA
4-H Saskatchewan

Entomology

Activity
Guide

Butterflies (and Moths)

Surely the most well-known insects, highly regarded for their colourful beauty and grace in flight, are the butterflies. As a group they are surely the showiest, with large fluttery wings often (though not always) covered with a dazzling array of colours. Tropical butterfly species might come to mind when thinking of butterfly species we may know, but Canada has an incredible diversity of these extraordinary creatures. In this section we will investigate the differences between butterflies and moths, and learn about their unique life cycle and adaptations that allow them to live in a wide range of habitats.

What is a butterfly? Looking closely, we can see that they have four wings, like a dragonfly or damselfly, and yet we know that they are a different group all together. Butterfly wings are much broader than those of a dragonfly or damselfly – this is usually the first thing that gives them away. Because of this, their flight is often much slower. They aren't in any rush. Unlike dragonflies or damselflies, butterflies are not predators. They feed on nectar, the sweet juice produced by flowers to attract insects. And because flowers have nowhere to go in a hurry, neither do the butterflies that feed on them.

Moving slower certainly has its perks; butterflies use less energy to get around. However, this slower movement make them more likely to be eaten by predators like birds. This is where a butterfly's colour and pattern play an important role in its survival. To us, butterflies are simply beautiful to look at. To predators, the display of colours and patterns can be very confusing. Have you noticed that many butterflies have big circles on their wings? These circles, to a hungry predator looking for a quick meal, can actually look like eyes. They are called eyespots. So when a butterfly sits on a flower to feed and senses a predator nearby, it may open its wings to reveal its eyespots. This might scare away the predator, as it jumps back thinking that this meal is actually much bigger than it originally thought, with such huge eyes! If the predator is bold enough to pursue the creature with the large eyespots, it may actually aim for the eyespots, thinking it will blind its opponent, or capture it by aiming for what it thinks is the head, when in reality it has been fooled! Predators will often punch a hole through the wing, giving the butterfly a chance to fly away as its body remains intact. A damaged wing is a small price to pay!

It is important that you recognize a distinction between butterflies and moths. "Butterflies" are usually what we call the day shift workers; the nectar gatherers of sunny summer days. They are usually brightly coloured to blend in with the flowers they feed upon, or to confuse their predators as described above. What we call "moths" are the night shift workers. They are the ones who appear as the sun sets, feeding on plants that bloom at night. They are often more modestly dressed, in shades of brown, black, dull red or rusty orange. This helps them blend in with the dark of the night. Taking their nocturnal habits into consideration, it seems simple and obvious to separate moths from butterflies. In fact, they are so closely related that they fall into the same overall group. So when we describe butterflies in general terms, we are really describing moths as well. They each share a similar life cycle.

Butterflies are one of the kinds of insects that go through a remarkable change. It begins when a female butterfly chooses a place to lay her tiny eggs. She may choose a twig, leaf or any surface that seems like a safe place to begin her family, and provide them with food once they hatch. She carefully lays her eggs on the surface, and once she is finished, her work is over. From now on, the young must fend for themselves.

When they hatch, young butterflies are hardly recognizable. They are long, with no wings, and may have many legs. These help them climb branches, and for the start of their young lives they will rely heavily on their many legs to carry them to tasty leaves, their main source of food. Young butterflies without wings are called caterpillars. Over the course of the coming weeks, a butterfly caterpillar can grow over 300 times heavier than when it first came out of its egg! To grow so quickly, caterpillars are capable of eating an enormous amount of leaves.

Once the caterpillar has grown to a certain size and reaches a certain age, it begins to show some extraordinary behaviour. It finds a safe place and slowly creates itself a home. It may occasionally build this home from leaves or surrounding sticks, but mainly it uses thin, but very strong threads of silk, which the caterpillar itself produces. After spinning many layers of silk around itself, the caterpillar is safe in its new home and begins its amazing transformation. This special silk house is called a cocoon. In the cocoon the caterpillar slowly starts to grow wings, and a more slender elegant body adapted to flying. This growth may take many months – in many parts of Canada the caterpillar remains in its cocoon over the entire winter.

In the spring the caterpillar emerges from its cocoon, except it is no longer a caterpillar. It is now a beautiful adult butterfly that looks almost exactly like a copy of its parents. The butterfly sits in the sunlight for a while, warming its wings, and after a moment it is ready to fly off, no longer looking for fresh green leaves but now in search of sweet nectar from flowers. One day it will find a mate, and the process will begin all over again as the female lays the next batch of eggs in a safe place.

This kind of life cycle, where the insect without wings is born from the egg, but develops them as it turns into an adult, is called metamorphosis. Remember that caterpillars eat leaves, and so looking on the undersides of leaves is a good place to try to observe how a caterpillar eats. In the fall, look for cocoons in safe, dark places. Around gardening equipment, or backyard decks are good places to look. If you want to see different adult butterflies, finding a garden or a field with many blooming flowers will surely be a good place!

When watching butterflies, it is very important to remember how fragile they are. Not only are their wings very thin, but also the colour on their wings actually comes from hundreds of thousands of little pieces put together, almost like shingles on a roof. These shingles are very light, and so do not weigh down a butterfly. Each one can reflect light a slightly different way, and thus produce amazing colours when viewed from a distance. These shingles are extremely delicate though, and the slightest touch from even the gentlest young entomologist can remove many of them, thus damaging the colour of the butterfly's wings, and making them less effective for predator diversion and flight. Make sure that you only study butterflies with your eyes once you capture one.

Discussion

- Why do you think certain species of insects are attracted to certain species of plants?

- Which plant do you think is more likely to attract more insects, one with a large flower or one with a small flower, and why?

- Besides collecting nectar, what else do insects do when they visit flowers?

Drawing Butterflies and Moths

What you will learn

Practice drawing the basic body plan of a butterfly or moth. Learn how to focus first on the important features (wing shape, colours, patterns) and building up to adding as much detail as you like.

What you will need

- Paper
- Pencil
- Pencil crayons
- A ruler
- A live specimen or a picture of a butterfly or moth

Instructions

When drawing butterflies, the focus should be on the size and shape of the wings, the colours present and any obvious colour patterns. Some species of moths and butterflies have characteristic bodies that are thick or thin, hairy or colourful. You can practice drawing these too, but the majority of butterfly identification comes from looking at the wings, so make sure you focus first on drawing and colouring in your butterfly's patterns.

1. Notice that butterflies have two sets (four in total) of wings. Sometimes, the hind wings may be larger than the front wings. If you want to make sure you get the proportions right on your butterfly wings, try using a ruler to measure the length and width of each wing and compare the front wings to the back wings.
2. Once you have drawn an outline of the wings onto a basic butterfly body, start paying close attention to the pattern on the butterfly's wings. Some of the most important things to draw, if present, are eyespots. Make sure you draw an accurate representation of the size of the eyespots on the wings and where they are located.
3. Then draw or colour any other distinctive patterns of the butterfly wing.
4. Lastly, you can draw in your butterfly's legs. These are not often used in the identification of species, so you can leave them out when you're just practicing the basic body plan.

Some butterfly species in Saskatchewan



Monarch



Canadian Tiger Swallowtail



Little Wood-Satyr



Mourning Cloak



Painted Lady



Red Admiral