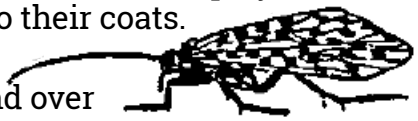
# Wild Kids

## Aquatic Insects

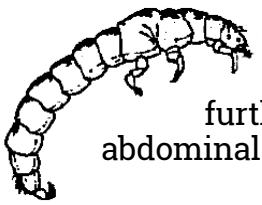
STUDENT GUIDE

Trichoptera are an order of aquatic insects commonly called caddisflies. The name caddisfly comes from the 15th or 16th century English word "cadise." At that time, cotton and silk were often referred to as cadise. Peddlers of cotton and silk, called cadisemen, often displayed their wares by attaching pieces of cotton or silk ribbon, braids and yarn to their coats.



There are more than 975 species of caddisflies in North America, and over 4450 species worldwide. Caddisflies are common and can be found near just about every pond, lake, creek or stream. Adults are moth like. At rest, adults hold their wings over their body and head in a tent-like manner. Adults are nocturnal, resting during the day in a cool place. Eggs are laid in strings or in masses directly into the water, on rocks in the water or on vegetation overhanging water.

Caddisfly larvae make cases that surround their bodies that offer protection from predators. They also help the larvae maintain their position on the bottom of streams and lakes. The cases are constructed of small objects that are held together with a glue-like substance or silk. Materials include objects like sand grains, bits of leaves, pebbles, twigs, strips of vegetation or even small snail shells. Case shapes can vary from tubular to bowl-shaped. Many species of caddisfly can be identified by the type of material used to make its case and its shape.



Caddisfly larvae are long and slender. Gills for respiration are found along their abdominal segments. Remember: insects have three body parts that are further divided into segments. There is also a hook-like appendage on the last abdominal segment. This hook helps to anchor the larvae in their case.

Most caddisfly larvae are either herbivores or detritivores. Herbivores eat living vegetation. Detritivores eat dead or decaying material, called organic matter. Organic matter can be either vegetable or animal in origin. Caddisfly larvae can be grouped into one of four groups based on how they obtain food. **Scrapers** tend to graze on algae that is attached to surfaces such as rocks, sand or wood. **Shredders** chew the leaves, flowers or stems of aquatic plants. **Collectors** feed on very small pieces of organic matter, less than 1 mm across. Some collectors are net makers. They will make a net of silk and cast it out into the current. The net filters out fine pieces of material. Caddisfly larvae then gather up the net and feed on the contents. Finally, predaceous caddisfly larvae eat other aquatic arthropods. **Predaceous** caddisfly larvae do not make protective cases, but may construct shallow burrows from which they ambush prey.

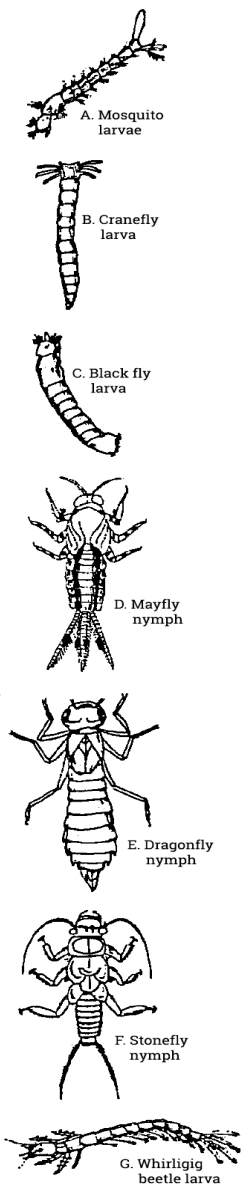
Caddisflies play a vital role in freshwater biology and it is the larvae that are important, not the adults. Many types of fish and predaceous insects depend upon caddisfly larvae for food. They are an intricate link in the food web.

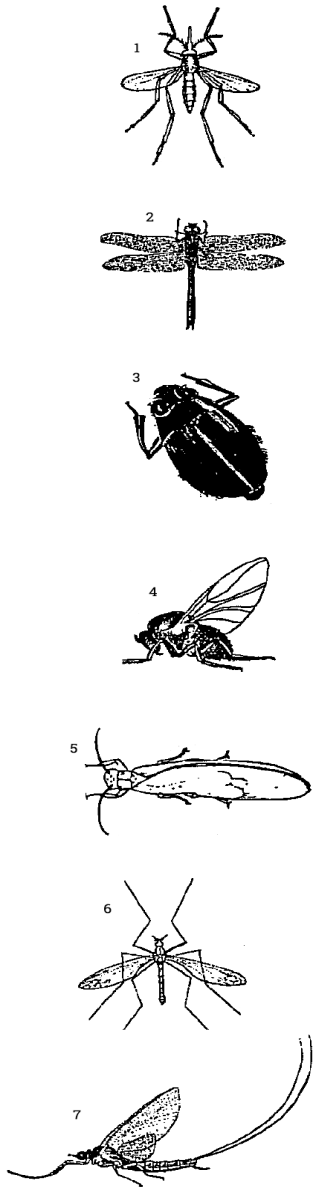
**ACTIVITY: LARVA VS ADULT**

Many aquatic insects undergo metamorphosis. Metamorphosis means "change during growth." There are two types of metamorphosis - simple and complete. In simple metamorphosis, the egg hatches into a nymph. Insect nymphs have essentially all the features of an adult. As they grow they are similar at each stage.

In complete metamorphosis, larva hatch from eggs. The larva grows through several stages, then forms a pupa. Pupae are usually stationary (do not move about) and are encased in a protective covering. Once the pupae finish growing, adults emerge from the covering. Adults at first are soft and pale-colored, but will harden and darken in a short period of time. The adult, pupa and larva usually do not look like each other.

Below you will find two groups - adult and larval/nymph stages of a few aquatic insects. Match the adult form on the right with its corresponding larval/nymph stage on the left. You may need to do a bit of research to complete this activity.



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TEACHING GUIDE

### Overview

In this activity, students will read an article about a specific group of aquatic insects known as caddisflies. Using information from the text as well as their own research, they must then try to match the larva or nymph from various aquatic insects to their adult stage.

**Grade**
5th

**AZ Science Standards**
- 5.L3U1.9

**Science and Engineering Practices**
- Obtain, evaluate and communicate information

**Crosscutting Concepts**
- Patterns

### Suggested Procedures

1. Print the worksheet above. If possible, print it double sided.
2. Ask students to read the first page.
3. Ask students the following questions to assess their comprehension:
    - What is a caddisfly? Where did it get its name?
    - What are the different ways in which caddisflies get their food?
4. Have students read the short passage on the second page. Check for undertanding on metamorphosis.
5. Ask students to complete the matching activity. They need to match the larva or nymph in the left column with the correct adult in the right column. It should be noted that they do not have all of the information in the text. They may need to use other sources, such as field guides, to help them.
6. Discuss the results with the class.
7. Ask the following questions:
    - What is difference between simple and complete metamorphosis? Can you provide an example of different animals for each one?
    - What is the difference between a larva and a nymph? Did this help you in identifying the correct insects?