
## Reading: What is an insect?

Insects are by far the most numerous animals on our planet. More than 1 million species of insects have been named (350,000 of these species are beetles!). Estimates vary widely, but many scientists believe there are 6-10 million species of insects in the world. That leaves at a lot of insects out there to be discovered and named! In the Tahoe Basin it is believed that there are more than 5000 species of insects.

Adult insects have three main body parts, including the head, thorax, and abdomen, six legs, four wings (if they fly), a hard outer shell called an exoskeleton that protects them, and two antennae. Try to point out each of these body parts on the grasshopper below:

**Insects have three main body parts:**

- The **head** includes the eyes, two antennae, and mouth.
- The **thorax** is in the middle, where four wings and six legs are attached.
- The **abdomen** is the largest part and holds the insect's heart.

Caterpillars are the larval phase of butterflies and moths

Insects may not have all of these parts when they are young. Some insects look very different from when they first hatch, or from their **larval** phase to their mature or adult form. Butterflies and moths, bees, and beetles all undergo complete **metamorphosis**. After hatching from an egg, they start as caterpillars or grubs. After metamorphosis, they emerge with a completely different body, usually with wings, sometimes very different coloring, and go from perhaps having no legs to six legs. Other insects begin their life in the water, such as dragonflies. These insects lay their eggs in the water. When larvae are hatched, they spend the beginning of their life in the water, before their wings fully form and they emerge into land and air. Grasshoppers look very similar as larva and adults. They undergo a series of partial metamorphoses as they grow larger and their wings form.

Insects are incredibly important to our ecosystems. They are a huge part of the food web. Insects are the sole food source for many birds, mammals, reptiles, amphibians, fish, arachnids, and other insects. For example, Carpenter Ants play a large role in Tahoe's food chain; they are a favorite food of Pileated Woodpeckers and American Black Bears.

Some insects are **pollinators** who help provide humans and other animals with food. Bees, butterflies, wasps, beetles, and moths can all be important pollinators. Pollination happens when pollen moves from flower to flower. The pollinators do this because they are attracted to the flower by the smell and color to drink the nectar or eat the pollen. While feeding, pollen attaches to their legs and body. When a pollinator moves to a different flower some pollen that pollen is spread. This fertilizes seeds in order for them to be able to grow. Without pollinators, humans and animals wouldn't have foods like tomatoes, mangos, chocolate, peaches, bananas, honey, cashews, apples, and strawberries.


Western Pine Elfin Butterfly

Insects also can be **decomposers**. They break down dead **organic matter**, such as dead animals or logs, and convert the dead material into energy which goes up the food chain. Many insects are omnivores, eating a variety of foods including plants, fungi, dead animals, decaying organic matter, and nearly anything they encounter in the environment.


ne Sawyers are Tahoe' Largest Beetle.


Norton's Giant Ichneumon Wasp

In spring and summer, insects are abundant and easy to find. Search for different kinds of insects in places related to their lifestyle. Search for pollinators near or on flowers, and search for decomposers in dead logs, stumps, or trees. You could also search near standing or running bodies of water, behind decaying bark, or underneath rocks on the ground (just be sure to put them gently back in place when you are finished). When searching for insects, like most animals, it helps to be quiet and still. If you handle an insect, do so gently, avoiding touching their wings and legs in particular. It is better to capture an insect in a net or jar than to hold it in your hands. You can also search for evidence of insects, such as the galleries of trails that bark beetles make behind bark on dead trees, or bites taken out of leaves.

As you study insects, TINS wants to help. If you have questions about what you find, photos of insects you would like help identifying, or if you want to share what you have found, send an email to education@tinsweb.org to contact a naturalist.


Evidence of leaf-miners.


Evidence of bark beetles.

## Activities for Grades K-2

### Insect Sit Spot


Black Witch, the largest Moth in North America

Sometimes finding insects works best when you let them come to you. Try this sit spot activity on a sunny, calm day (late morning is a great time). Review the reading to learn what spots are good places to find insects. Find a spot to sit that is comfortable, and away from loud noise or too many people. Sit in that spot for 8 minutes. As you sit, make observations about the insects around you using the questions below as a guide. When you are finished, discuss these questions with a friend or family member:

1. What insects did you see?
2. What insect noises did you hear?
3. Did any insects land on you? Could you feel them? What did they feel like?
4. Did you see more insects on the ground or in the air?
5. What were the insects you observed doing?

### Catch an Insect

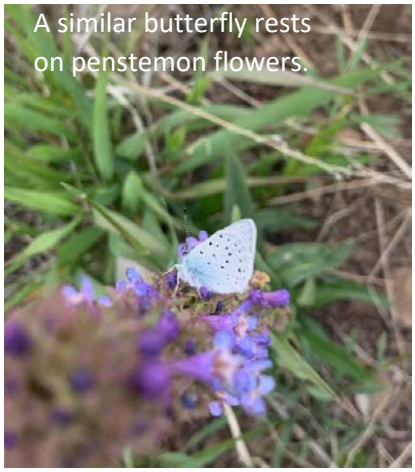
Use what you have learned from the reading to catch five different kinds of insects in your backyard or neighborhood. Show a family member how to properly catch and release the insects. Afterwards, discuss these questions with your family:

1. Where did you find the most insects?
2. Did you catch more insects on the ground or in the air?
3. Did you notice any potential predators of insects around?
4. What was the largest insect you saw? What was the smallest insect you saw?

### Insects and Plants

Have you ever noticed that you see more insects around diverse plant life? The kind of plant an insect is found hanging around can tell us things about that insect, such as what it eats, where it lays its eggs, or where it lives. In this activity, go for a nature walk or hike, ideally somewhere you will see many different kinds of plants, such as a meadow. As you walk, go slowly and search for insects on the plants. Take someone with you and see who can spot the most insects on plants. Notice which plants you see insects resting on. Are there more of these same plants in the area? Check those out for insects as well.


This butterfly is resting on sagebrush.


A similar butterfly rests on penstemon flowers.


Mosaic Darner

## Insect Art

Choose the two most interesting insects that you have caught or seen. Use what art supplies you have to draw, paint, build, or sculpt these two insects. Make sure to include all of the body parts mentioned in the reading section.

Describe to a family member one special observation about each insect you draw, such as if the insect has a torn wing, or describe the texture on their bodies.

TINS wants to see your art! Have your parent post a photo of your art project to Facebook and tag Tahoe Institute for Natural Science. You could also email the photo to us at kendal@tinsweb.org.


Cow Path Tiger Beetle

## Words to Know

**Larva:** The immature form of an insect.

**Metamorphosis:** The process of transformation from an immature form to a mature form.

**Pollinator:** An animal that moves pollen from the male part of flowers to the female part of flowers.

**Decomposer:** An organism that breaks down organic matter.

**Organic Matter:** The material that makes up life forms, such as a body or plant.

## Palabras para conocer

**Larva:** Animal que se encuentra en la primera etapa del desarrollo posembrionario.

**Metamorfosis:** Transformación que experimentan determinados animales en su desarrollo biológico y que afecta no solo a su forma sino también a sus funciones y su tipo de vida.

**Polinizadora:** Algo que hace el proceso mediante el cual el polen llega al estigma de una flor.

**Descomponedor:** Un tipo de organismo que se ocupan del aprovechamiento de la materia y de la energía que presentan los restos de animales y de plantas.

**Materia orgánica**: Materia que se forma las formas de vida los cuerpos y plantas.

## Further Learning

Check out the TINS activity book.

Watch this video on insects.

Play insect BINGO.

Sing the Insect Song to learn its body parts.

Build a LEGO insect.