

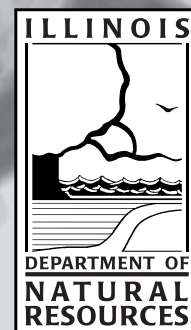
State of Illinois
Rod R. Blagojevich, Governor

Illinois Department of Natural Resources



Wings, Stings and Leggy Things

Insects of Illinois



**Illinois Department of
Natural Resources
Division of Education**

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What Good is an Insect?

Insects are very useful in a variety of ways. Insects...

- are important pollinators of plants, especially fruits and crops.
- provide honey, wax and silk.
- help control pests.
- provide food for many birds, fishes, humans and other animals.
- can be used as indicators of water pollution.
- help to treat diseases in people.
- improve soil quality because their burrows provide air spaces and because they recycle organic material.

Vocabulary

adaptation - a special shape, behavior or body part that helps an insect survive

antennae - a pair of "feelers," one on each side of the head, used to help an insect sense its environment

arthropods - animals, including insects, that have jointed legs and a hardened outer shell

camouflage - color or pattern that conceals an insect by matching its background

caterpillar - larva of a butterfly or moth

chrysalis - pupa of a butterfly, the life stage between caterpillar and adult; usually has a camouflaged covering and is exposed to weather

cocoon - protective case made of silk fibers secreted by a larva, in which it will pupate

dormant - inactive, as during very cold weather

entomologist - person who studies insects

entomology - the scientific study of insects

exoskeleton - external, waterproof, protective body covering that houses and supports internal organs, muscles and other tissues

habitat - place an animal lives

insectivorous - feeding on insects

larva (plural, larvae) - the young form of an insect with complete metamorphosis

metamorphosis - changes in the shape, structure and habits of an insect as it grows into an adult

migrate - travel from one area to another

molting - shedding an insect's hard outer skin as its body grows larger

nymph - a stage in incomplete metamorphosis in which the insect resembles the adult but lacks wings and cannot reproduce

pollinate - to fertilize a plant by moving pollen to the female structures of a flower

pupa (plural, pupae) - a stage of complete metamorphosis between larva and adult

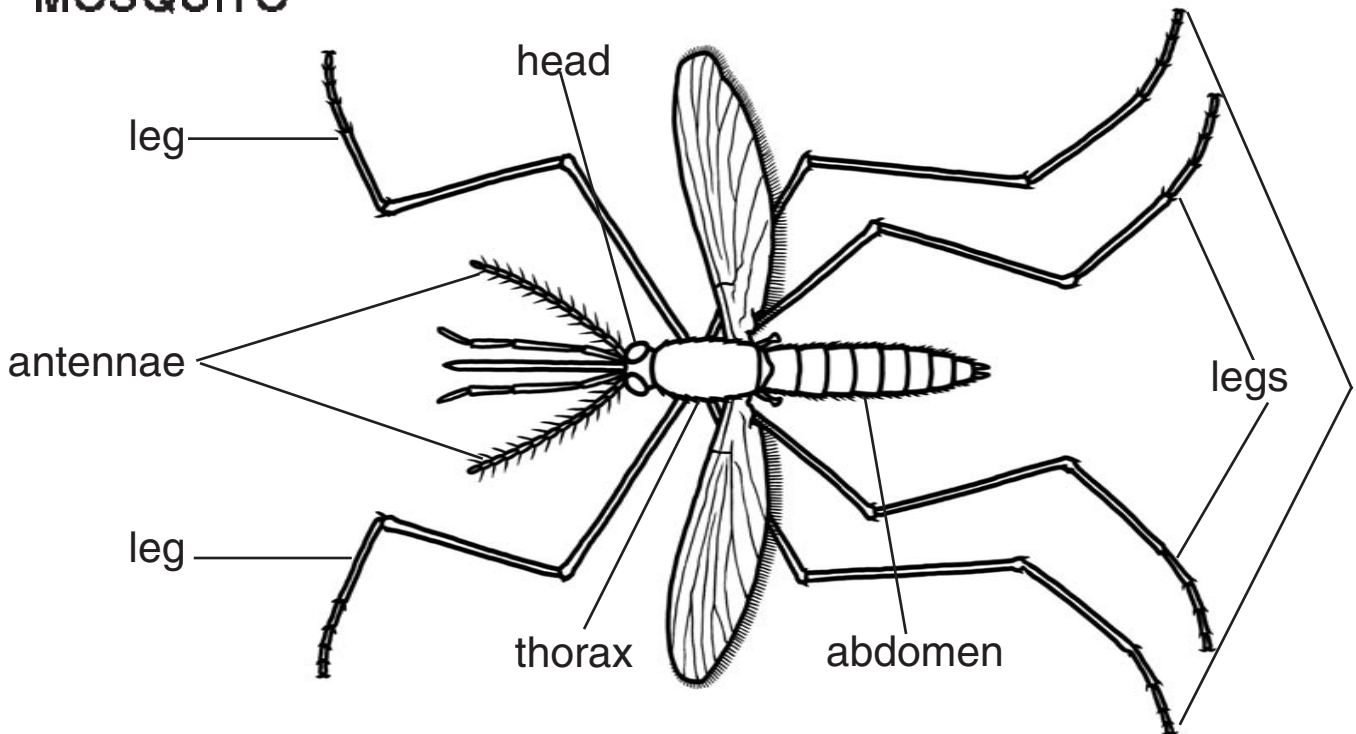
taxonomist - person who studies how organisms are grouped and named

taxonomy - the scientific study of naming and grouping living things

What is an Insect?

Insects belong to a group of animals called arthropods. Arthropods have jointed legs and a hard body wall. Some other animals that belong to the arthropod group are shrimps, spiders, crabs and lobsters. Insects differ from other arthropods because they have six legs and three main body parts: head; thorax; and abdomen.

MOSQUITO



How Many Chirps Does a Cricket Chirp?

A cricket chirps more often in hot weather than cold. Only male crickets chirp, and they do it by rubbing their wings together. Did you know that by counting the number of chirps a cricket makes in a minute you can come within a few degrees of the temperature outside? Try it!

1. Count the number of chirps made by a cricket in a minute.
2. Subtract 40 from the number found in step 1.
3. Divide the number found in step 2 by 4.
4. Then add 50 to the number found in step 3.

The number you calculated should be close to the actual air temperature!

INSECT-RELATED WORDS

L	A	G	S	G	E	L	D	E	T	N	I	O	J	T	O	W	L	Q	O	T	P
S	H	V	Y	D	S	C	D	A	H	J	I	N	E	L	C	R	T	Y	I	E	S
P	V	S	R	H	F	R	T	Y	P	N	M	K	I	A	Q	P	O	E	L	D	S
E	S	R	J	A	G	Y	S	D	V	U	E	A	M	U	T	S	C	T	X	T	A
C	B	U	M	B	L	E	B	E	E	T	P	O	A	T	N	G	E	A	Y	U	N
I	R	E	U	I	S	A	F	B	A	D	U	T	E	J	K	E	T	R	I	C	T
E	G	H	M	T	R	E	F	N	N	F	P	X	Y	W	B	L	Z	G	C	R	H
S	B	A	S	A	Q	I	I	C	L	Y	E	J	A	O	P	X	G	I	R	T	L
W	F	R	G	T	H	L	U	A	L	O	L	N	H	R	W	I	W	M	E	E	U
Y	R	N	A	Z	L	T	G	U	G	H	B	N	B	M	O	S	L	O	P	W	N
D	L	G	N	O	X	E	D	S	C	E	A	Q	Y	T	R	H	G	F	P	B	O
Y	I	F	P	J	M	N	P	O	H	K	T	N	P	I	E	J	T	Y	O	G	T
G	B	V	R	E	A	R	T	H	R	O	P	O	D	A	D	S	E	A	H	N	E
O	A	N	T	E	N	N	A	E	Y	W	A	B	D	E	D	C	B	P	S	L	L
L	D	B	G	F	T	M	H	U	S	H	D	L	O	P	K	U	M	Y	S	T	E
O	M	I	L	R	I	T	G	F	A	V	A	W	Q	S	A	Y	E	F	A	G	K
M	V	T	G	T	O	U	U	W	L	S	E	B	R	Y	N	B	Y	R	R	B	S
O	B	C	E	M	J	E	F	B	I	N	O	O	C	O	C	O	D	K	G	E	O
T	R	E	T	B	C	I	H	D	S	Y	U	G	B	U	N	V	R	O	D	C	X
N	P	S	Y	S	E	Y	E	D	N	U	O	P	M	O	C	E	T	A	M	H	E
E	L	N	F	R	D	E	S	W	V	G	N	H	Y	M	J	U	A	Y	B	E	T
Y	L	I	R	D	G	A	M	E	T	A	M	O	R	P	H	O	S	I	S	B	N

ABDOMEN
ADAPTABLE
ANT
ANTENNAE
ARTHROPOD
BEETLE
BUMBLE BEE
BUTTERFLY
CAMOUFLAGE
CHRYSLIS

COCOON
COMPOUND EYES
ENTOMOLOGY
EXOSKELETON
FAMILY
GRASSHOPPER
HABITAT
HEAD
INSECT
JOINTED LEGS

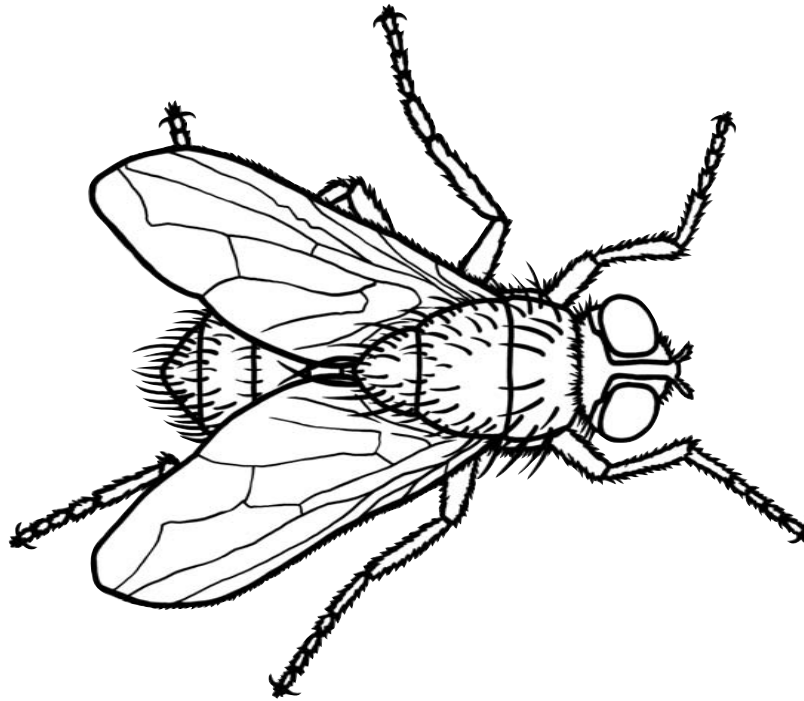
LARVA
METAMORPHOSIS
MIGRATE
MOTH
NYMPH
POLLINATE
PUPA
SIX LEGS
SPECIES
THORAX

Taxonomy

Taxonomy is the science of naming and grouping organisms. Scientists classify organisms into groups arranged in order from general to specific relationships: kingdom; phylum; class; order; family; genus; and species.

The complete classification of a common house fly is listed below.

Kingdom - Animalia
Phylum - Arthropoda
Class - Insecta
Order - Diptera
Family - Muscidae
Genus - *Musca*
Species - *domestica*



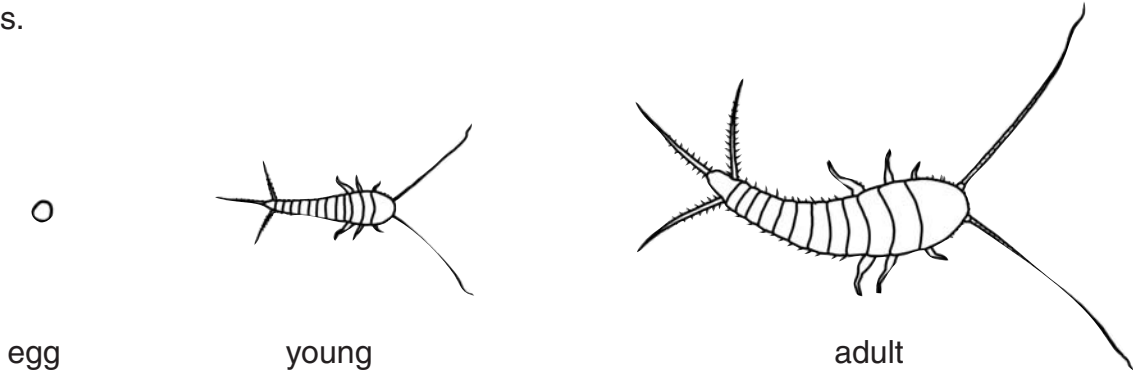
What is a Scientific Name?

Common names for organisms are often confusing because anyone can make them up, and they may apply to more than one species. A scientific name is the official name for each organism. It is made up of two parts, a genus name (written first, with the first letter capitalized) and a species name. Sometimes a third part, the subspecies name is also used. The name is always in Latin because when this naming process started, most people everywhere knew Latin. A scientific name must be underlined or in italics when written. In technical literature, the author's name often follows the species name to indicate the person who first described it as being new to science. Scientific names help scientists to study organisms, especially when working with other scientists. In this booklet, the scientific name for each species is listed below the common name.

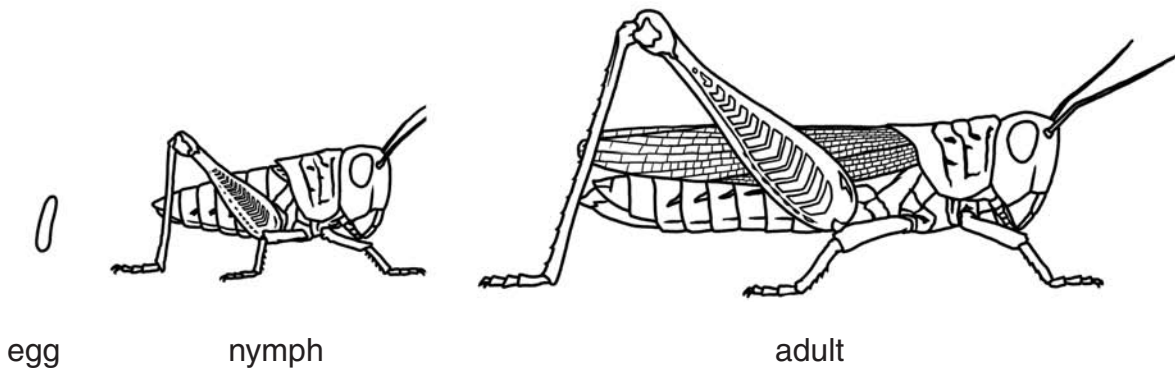
Insect Development

Metamorphosis is the change in shape and habits of an insect as it grows into an adult. Insects develop from an egg to an adult in three ways.

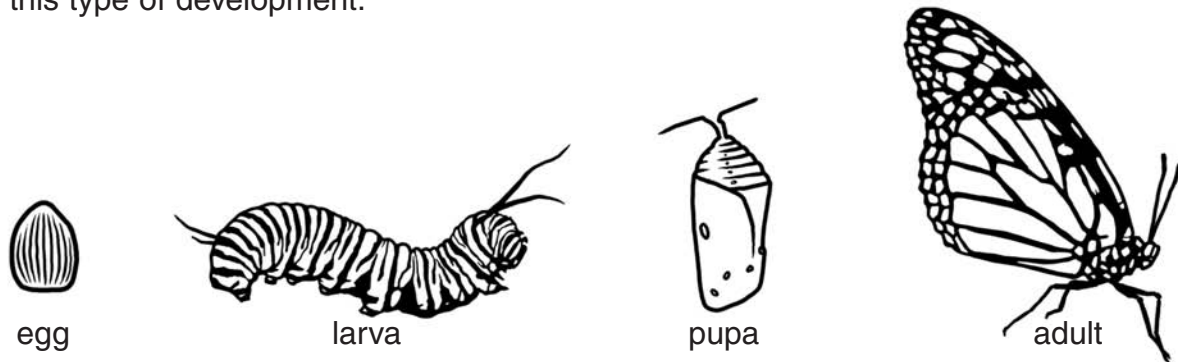
Simple Change - The insect's size changes as it matures. For example, this is how a silverfish develops.



Incomplete Change – The nymph looks like a small adult, but it has no wings and cannot reproduce. A grasshopper develops this way.



Complete Change – The insect must go through two stages between egg and adult. A butterfly has this type of development.



Insects often move, breathe and eat differently in each stage of development, helping them to survive changes in food supply, temperature or other harsh conditions.

Did you know. . .

- the first insects evolved 300 to 400 million years ago?
- fossils of butterflies have been found in rocks that are 40 million years old?
- there are nearly one million species of insects in the world?
- that butterflies taste with their feet?
- cockroaches lived on earth long before the largest dinosaur?
- the world's longest insect is the giant stick of Indonesia at about 13 inches long?
- a flea can jump about eight inches in the air?
- the sound of one cicada can be heard more than a quarter of a mile away?
- a fly moves its wings about 330 times each second?
- the largest order of insects worldwide is Coleoptera, with approximately 290,000 species of beetles?
- the largest insect in Illinois is the cecropia moth, with a wingspan of about six inches?
- bees have to make about 80,000 trips to flowers to make one jar of honey?
- leaf cutter ants travel up to one mile to get to their favorite leaf, and then carry it home with them?
- in Africa and South America millions of army ants form a column and go on marches together? Their column can be almost three feet across and hundreds of yards long.
- approximately 1,000 new species of insects are named each year?
- the life cycle of an insect takes place in less than one year in most cases?
- scientists estimate there are four million insect species that have not yet been discovered?
- some species of dragonflies have been known to fly 43 miles per hour?
- a katydid's ears are located on its front legs near its "knees."

Is a Spider an Insect?

Spiders are commonly mistaken for insects. Like insects, spiders are arthropods, but they belong to the Class Arachnida. Here is a list of differences between spiders and insects.

Spiders

eight legs
two main body segments
no wings
simple eyes
no antennae

Insects

six legs
three main body segments
wings
compound eyes
antennae

*Did you know that a spider's diet consists mainly of insects?

house fly

Musca domestica

Where does it live?

all over the world, around people and other organisms

What does it eat?

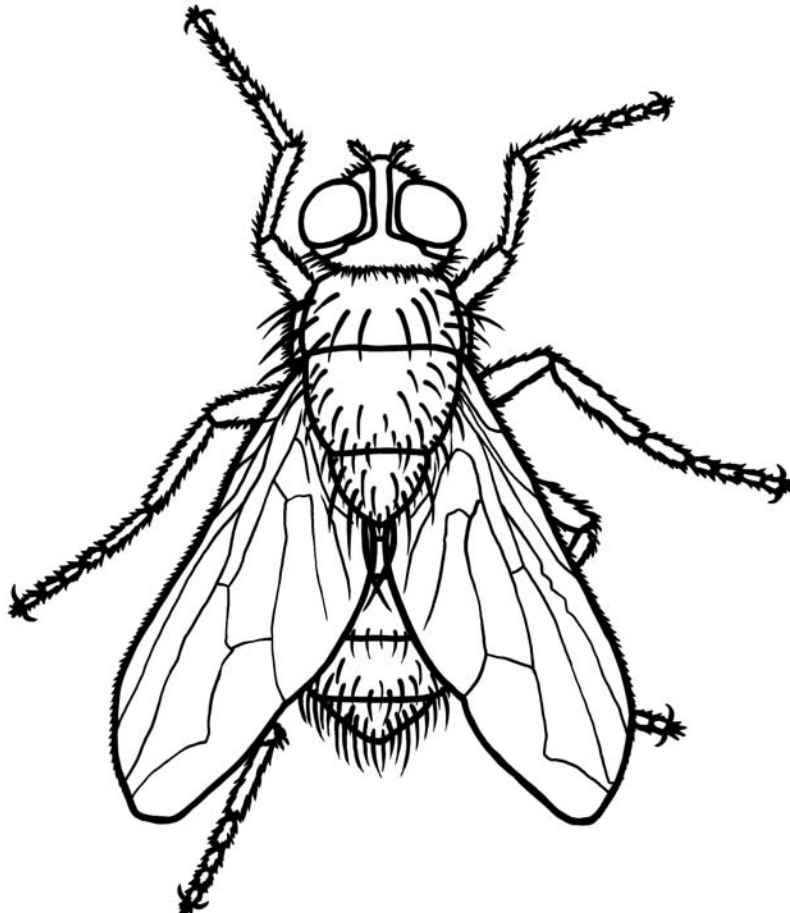
uncovered food or wastes

What adaptations does the house fly have that help it survive?

The house fly can sense changes in airflow with tiny hairs that cover its body. It has cushioned feet that “suction” and help it to climb on all surfaces, including walls and ceilings.

Here are a few facts you may not know about the house fly.

A house fly can beat its wings as often as 330 times per second. The approximate life span of a house fly is 29 days. During that time, a female can lay about 2,000 eggs. A fly can taste with its feet and smell with its antennae.



mosquito

Anopheles quadrimaculatus

Where does it live?

near water and wooded areas

What does it eat?

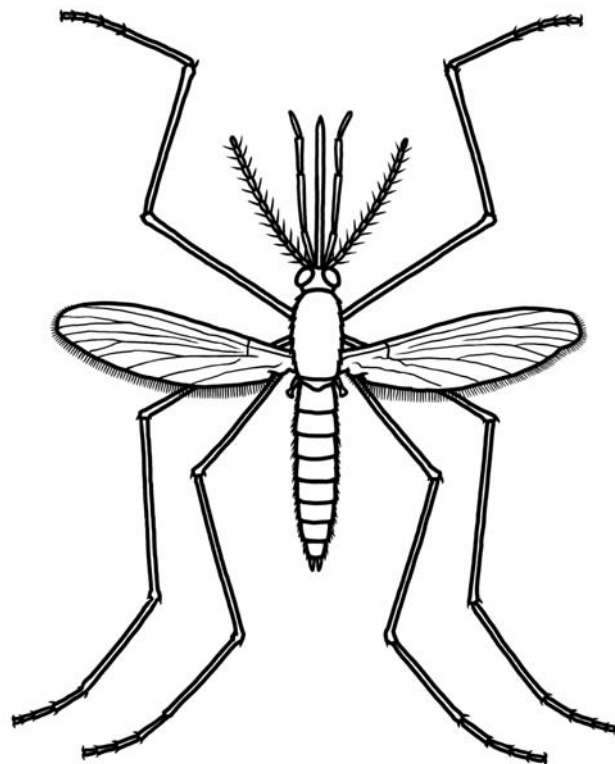
The male mosquito feeds on nectar and plant juices. The female also eats nectar but primarily feeds on blood. Blood is a very important part of the female's diet. It provides protein needed to develop and nourish eggs.

What adaptations does the mosquito have that help it survive?

The female mosquito uses its piercing mouthparts to penetrate the skin and inject saliva into the blood of its victim. The saliva contains an anti-clotting factor that allows blood to flow freely through the sucking mouthparts.

Here are a few facts you may not know about the mosquito.

A mosquito can beat its wings 600 times per second which produces a whining noise. Did you know when you are bitten by a mosquito that the bite itself does not itch? The itching is caused by a chemical found in the female mosquito's saliva. The bump on your skin is a result of the piercing bite.



grasshopper

Melanoplus differentialis

Where does it live?

in fields and grassy areas

What does it eat?

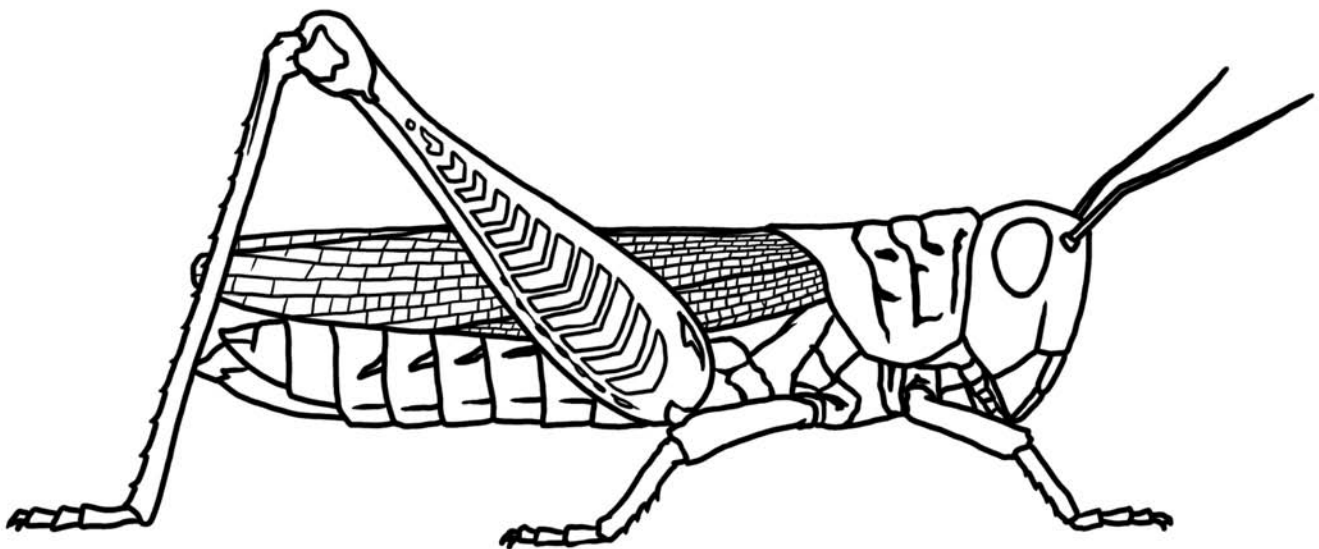
plants

What adaptations does the grasshopper have that help it survive?

A grasshopper has long, strong legs for hopping and moving. Its green body allows the grasshopper to blend into its surroundings and hide from predators.

Here are a few facts you may not know about the grasshopper.

An adult grasshopper only lives for part of a year. In fall, the female lays eggs in masses of 20-130 in packets below the soil's surface. The young emerge in spring.



green darner dragonfly

Anax junius

Where does it live?

near streams and ponds

What does it eat?

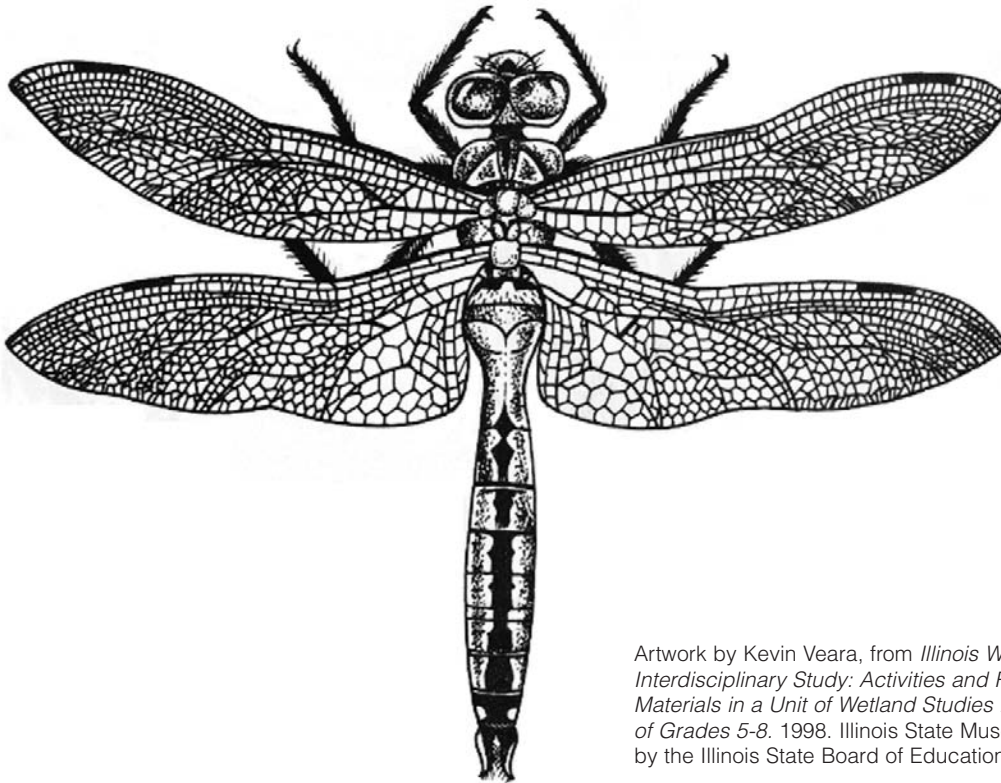
small insects

What adaptations does the dragonfly have that help it survive?

The dragonfly has the most accomplished flying technique in the animal kingdom. It can fly forward and backward, and its quick darting ability assists it in escaping predators. Catching prey or avoiding predators is simplified by its sharp vision. The dragonfly's compound eyes have 10,000-30,000 facets.

Here are a few facts you may not know about the dragonfly.

A dragonfly is beneficial to humans because it can consume large numbers of mosquitoes and black flies. It beats its wings more than 30 times per second and has been clocked at 43 miles per hour. The dragonfly usually catches prey while in flight.



Artwork by Kevin Veara, from *Illinois Wetlands, An Interdisciplinary Study: Activities and Resource Materials in a Unit of Wetland Studies for Teachers of Grades 5-8*. 1998. Illinois State Museum. Funded by the Illinois State Board of Education.

praying mantis

Stagmomantis carolina

Where does it live?

on vegetation in wooded areas or prairies

What does it eat?

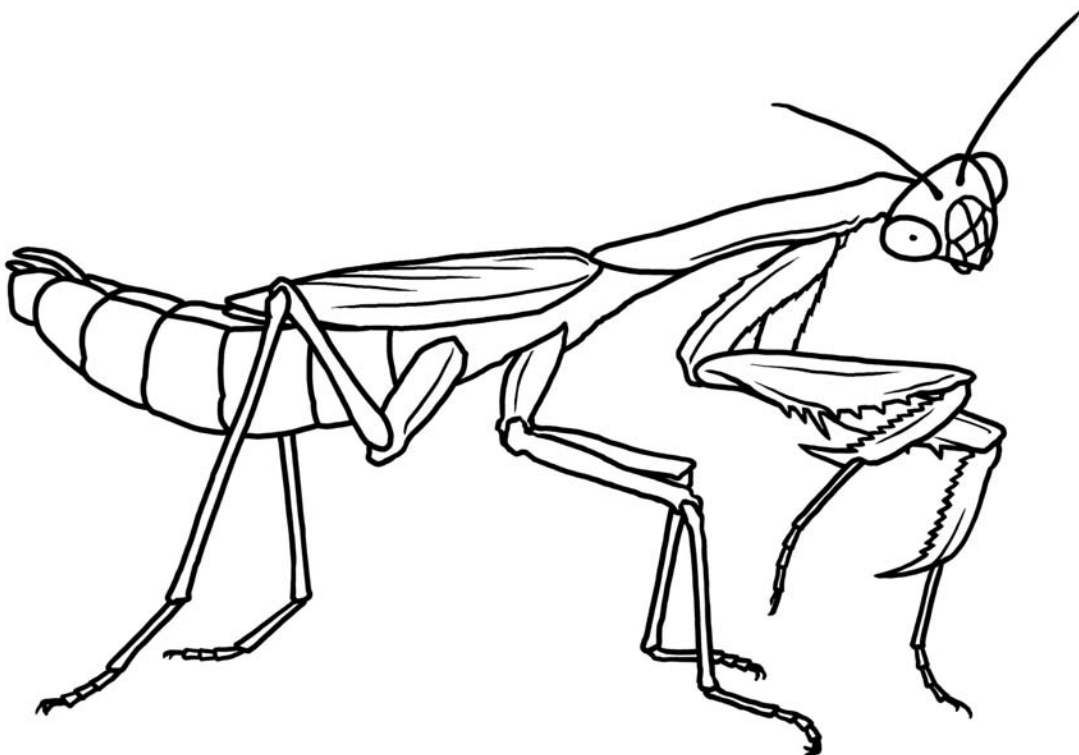
The praying mantis is carnivorous, eating all kinds of insects, including other mantises.

What adaptations does the praying mantis have that help it survive?

The praying mantis has spines that cover its front legs and are used to help capture and eat prey. The mantis' green or brown color acts as camouflage, helping it blend into the environment.

Here are a few facts you may not know about the praying mantis.

This insect is the only one that can turn its head all the way around (180°) and look behind it for predators. The female mantis usually eats the male mantis after mating with him!



monarch butterfly

Danaus plexippus

Where does it live?

open woodlands, habitat edges and pastures where milkweed grows

What does it eat?

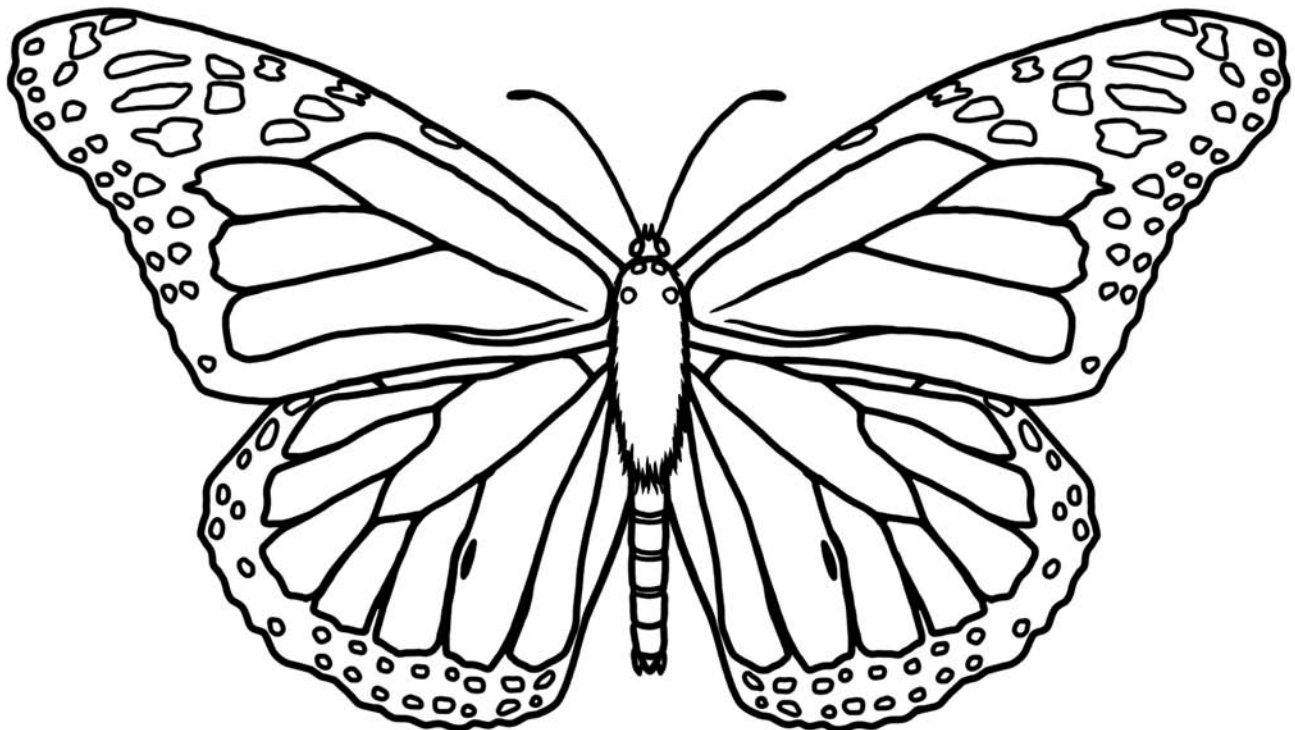
The larval stage of the monarch butterfly eats leaves of milkweed. The adult monarch feeds on flower nectar.

What adaptations does the monarch butterfly have that help it survive?

The monarch's body contains poison from the milkweed that the caterpillar ate. A predator that eats a monarch usually gets sick. Predators learn that the distinct coloration of the monarch is a warning sign, and its enemies stay away.

Here are a few facts you may not know about the monarch.

The monarch migrates up to 3,000 miles to escape winter weather and reach warmer climates. The monarch butterfly is Illinois' State Insect.



firefly

Photuris pennsylvanica

Where does it live?

in forests, on trees and other plants

What does it eat?

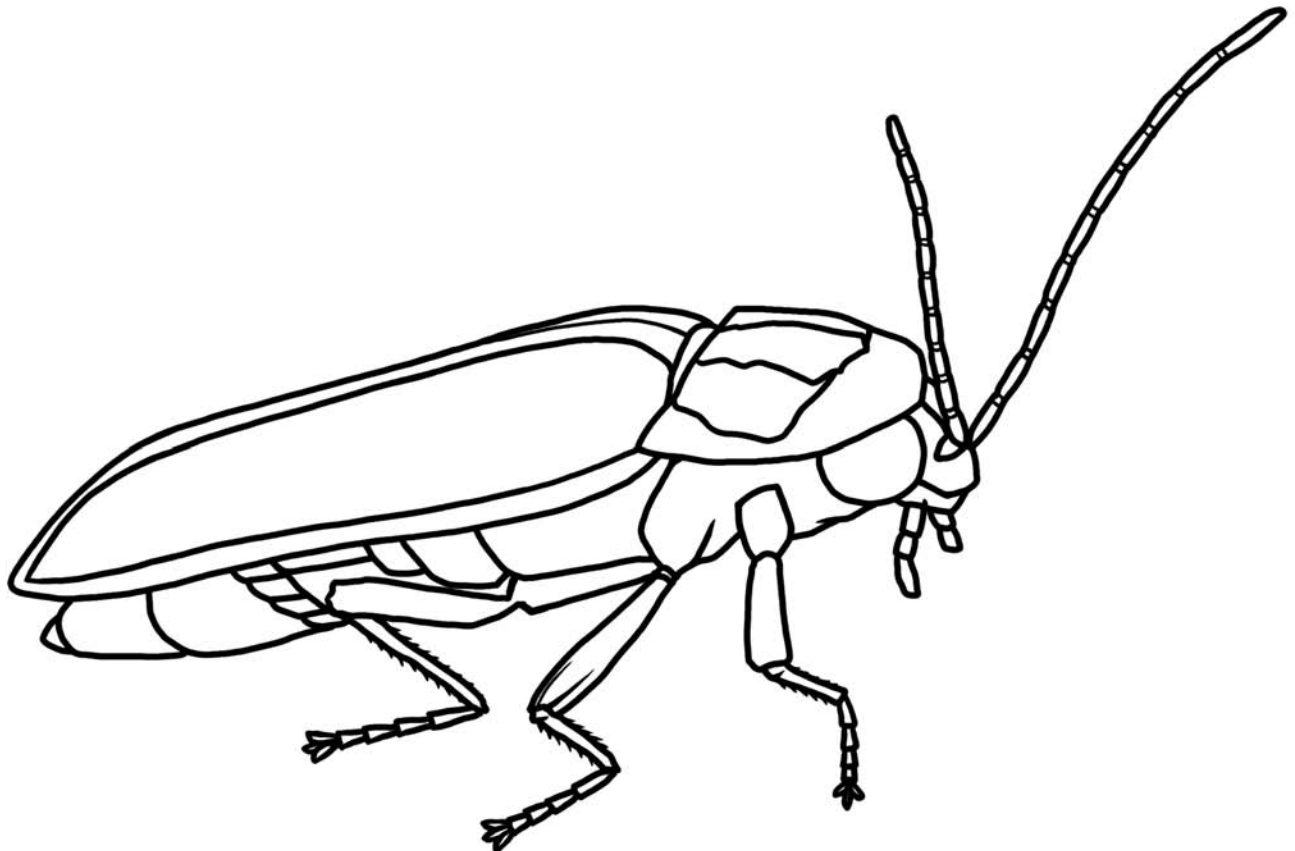
pollen and small insects, including other kinds of fireflies

What adaptations does the firefly have that help it survive?

The firefly flashes light while it flies. Light is produced in special organs on the lower abdomen. Adult fireflies use light to find others of their own species for mating. Larval fireflies glow to warn predators of the poisons or bad-tasting chemicals they contain.

Here are a few facts you may not know about the firefly.

Each species of firefly has its own unique flashing pattern which is active only during a limited period of the night. People in tropical countries sometimes put fireflies in a bottle to use as a lantern.



honey bee

Apis mellifera

Where does it live?

in a hive near flowers

What does it eat?

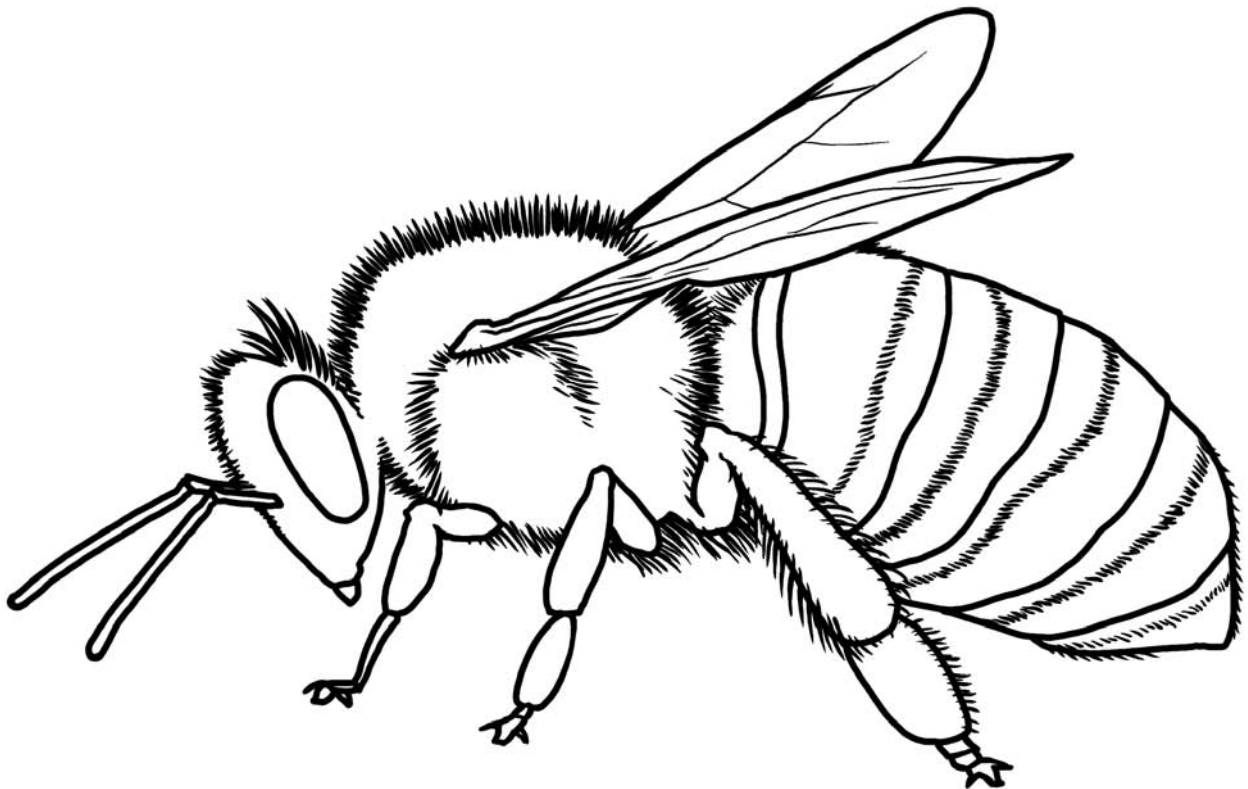
pollen and honey made from the nectar of flowers

What adaptations does the honey bee have that help it survive?

The honey bee has the ability to turn nectar from flowers into honey, which is stored in the hive. There is division of labor between the bees in a hive. Every bee does its job and is important to the survival of the colony.

Here are a few facts you may not know about the honey bee.

Only the female honey bee has a stinger. She can sting only once, leaving the sting and venom gland in her victim. Afterwards, she dies. One female, the queen, lays all of the eggs for the colony. She can deposit 1,500 eggs a day!



water strider

Gerris remigis

Where does it live?

the still surface of ponds and streams

What does it eat?

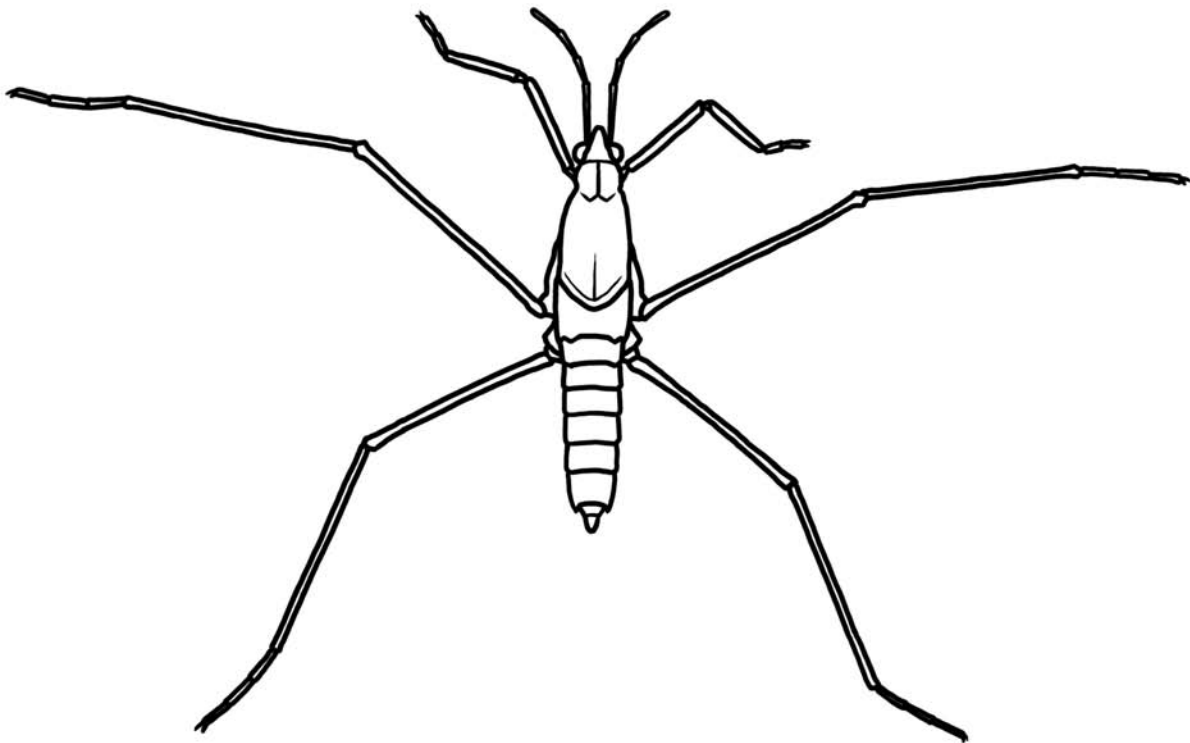
The water strider feeds on insects and other aquatic organisms.

What adaptations does the water strider have that help it survive?

The front legs of the water strider are short, modified for grasping and used strictly for capturing prey. The middle and hind legs are long, have claws and are used for darting across the water. As the water strider travels through its environment, it pushes with its middle legs, steers with its hind legs and is able to capture prey with its front legs.

Here are a few facts you may not know about the water strider.

The water strider not only glides on still water but is also capable of walking on the surface of running water. Due to its light body weight, a water strider never breaks the water's surface, and its legs never get wet.



ladybug (ladybird beetle)

Coleomegilla maculata

Where does it live?

in fields, yards and gardens

What does it eat?

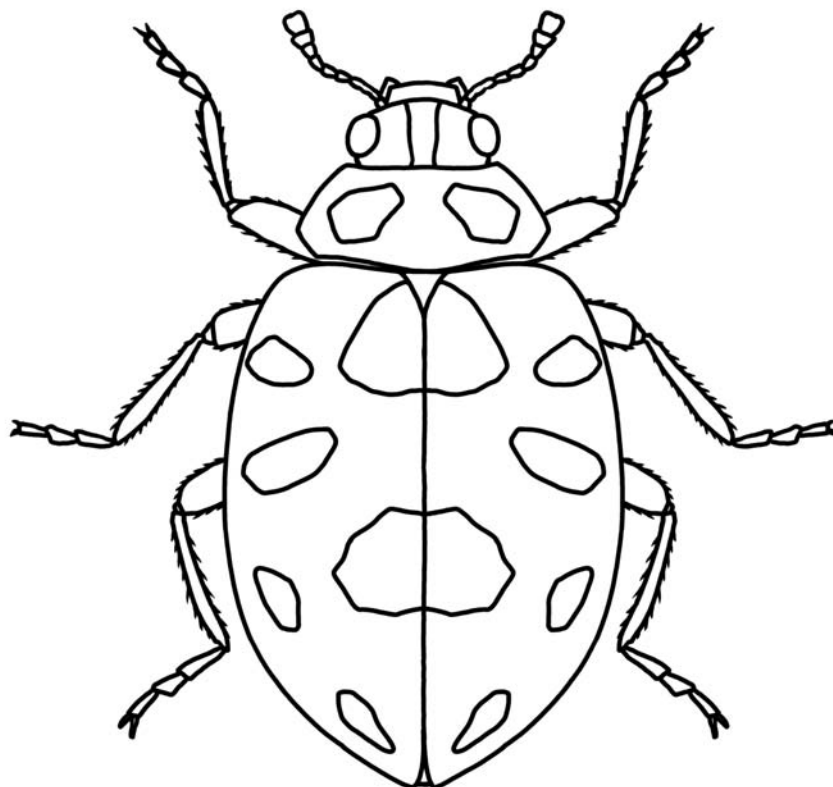
The ladybug eats mostly aphids and other garden pests. As fall approaches, it may eat pollen to convert to fat for winter hibernation.

What adaptations does the ladybug have that help it survive?

The ladybug has a hard shell that protects its wings and deters predators from eating it. A ladybug “plays dead” when in danger because many predators won’t eat an insect that doesn’t move.

Here are a few facts you may not know about the ladybug.

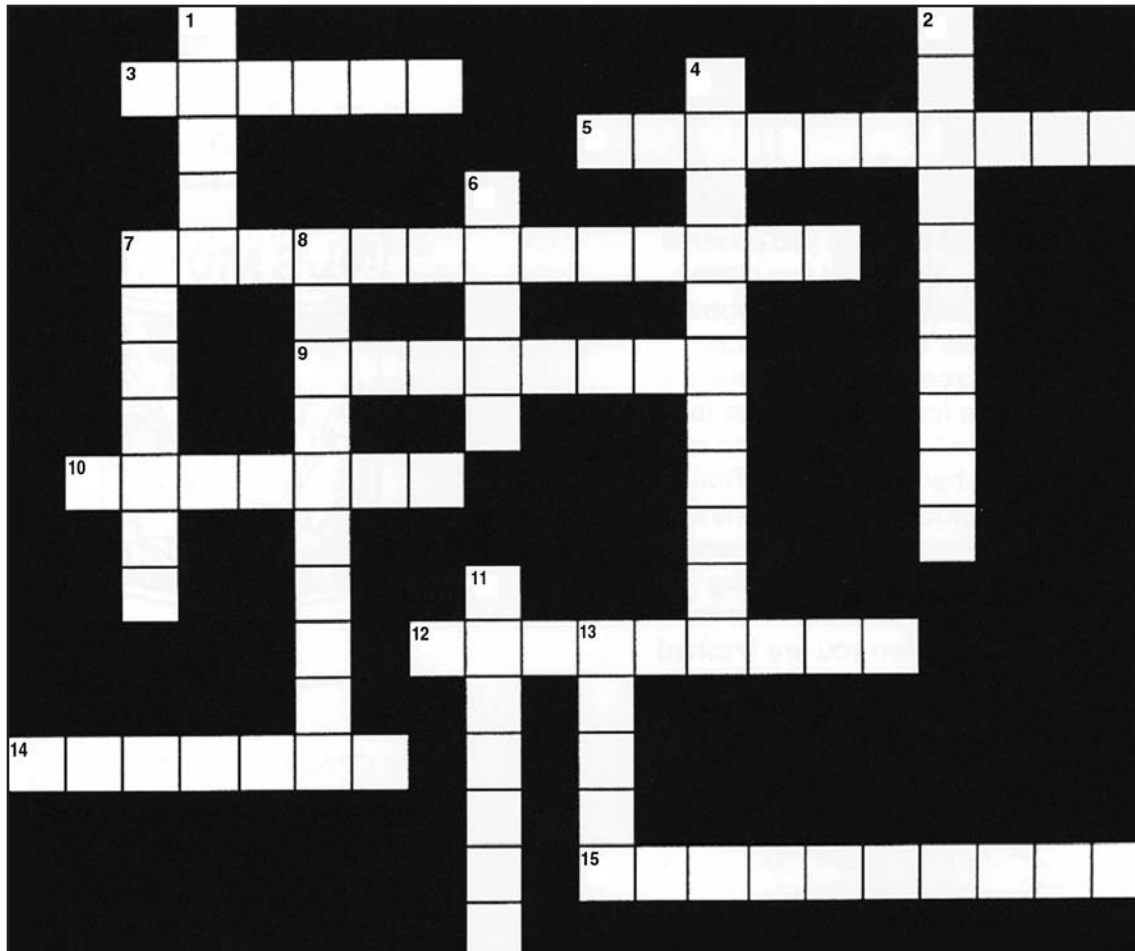
Most people know this insect by its nickname, the ladybug. Entomologists refer to it as the ladybird beetle. During winter, the ladybug hibernates in a protected place, such as a tree stump, crack in wood or ground-covering vegetation. Ladybugs hibernate in groups of 50-100 to produce and conserve warmth. Did you know that ladybugs won’t fly when the temperature is 55° Fahrenheit or lower?



Unscramble These Insects

1. Everywhere a ___ goes, it leaves germs. l y f
2. ___ make wax and honey and live in hives. e b s e
3. _____ feed off the blood of many animals, including cats, dogs and even humans. e s l f a
4. _____ eat wood. s t m e i r e t
5. You might see a _____ after dark, because it glows. y f r e i l f
6. _____ are red or yellow in color, have 2-24 black spots and eat aphids. g s d y a u l b
7. _____ begin their lives as caterpillars. t f u i e b e t l r s
8. _____ usually live near freshwater streams and ponds and eat mosquitoes. o n g f s i r a d l e
9. _____ are well camouflaged as twigs or sticks.
i w s k l a t g k n c s i
10. _____ resemble a leaf and their song slows down as the temperature gets colder. i a t k s d y d
11. _____ live in colonies, build hills and always enjoy a good picnic lunch.
s a t n
12. _____ live everywhere people do, and their bite causes an itchy red bump. u s m o q s t i e o
13. _____ are usually black or brown in color, resemble a grasshopper and chirp. k t c e s r c i
14. _____ are known to sting, have wings and pollinate flowers. p s w a s
15. _____ may be found on a human's head and cause itching. c e l i

Insect Crossword Puzzle



ACROSS

3. The body part that is between the head and the abdomen.
5. A person who studies how insects are named and grouped.
7. Changes in the shape and habits of an insect as it grows into an adult.
9. An insect's "feelers."
10. The place where an insect lives.
12. Some insects fertilize or _____ plants.
14. When an insect is in an inactive state it is considered to be _____.
15. This group of animals has jointed legs and a hard body covering and includes insects.

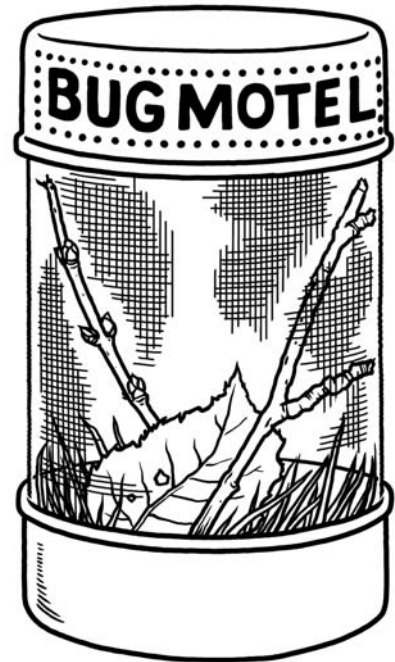
DOWN

1. An insect has _____ pairs of legs.
2. When an insect has a certain color or pattern that lets it blend into the background.
4. External skeleton.
6. A group of related insects which may include many families.
7. To travel from one place to another, usually for the winter.
8. A special shape or body part that helps the insect to survive.
11. An insect's legs are _____.
13. The stage of an insect between egg and pupa is the _____.

Activities You Can Do At Home

Make a Bug Motel

A bug motel can be used as a temporary home for insects. This will help you observe insects more closely. You need two clean cans, like tuna or cat food are packaged in, and a rectangular section of window screen. Cut the screen the circumference of the can plus one inch wide by six inches tall for overlap and a “door.” Window screen can be purchased at a hardware store. Roll the screen to fit inside one of the cans and place the second can on top. Add some grass, leaves or twigs to make the bug motel a more natural environment for the bugs you observe. When you are finished observing the bug be sure to release it back into its natural environment.



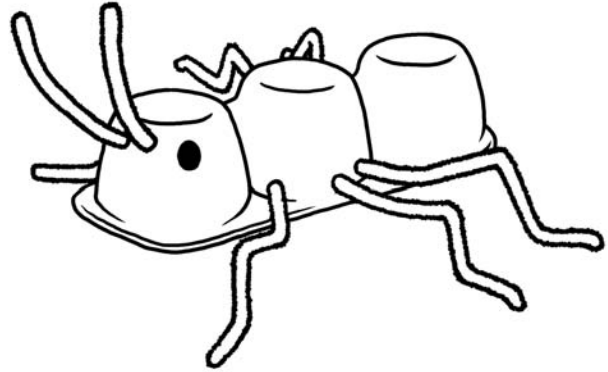
OR

Fill a clear plastic cup half full with dirt. Add a stick, leaf, rock and a bottle cap full of water to the cup. Have an adult poke a few small holes in the bottom of another plastic cup. Put the insect you are going to observe in the cup with the dirt, overlap the top of this cup with the top of the empty cup, and tape the cups together. Observe your insect for a short time and then return it to its natural environment.



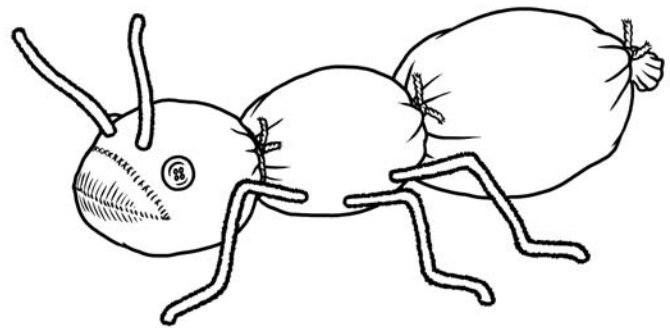
Create an Ant

You will need an egg carton and pipe cleaners. Carefully cut out a row of three egg cups. Attach six pipe cleaners to the body and bend them to look like legs. Draw two eyes at one end of the egg carton to become the insect's body. At the same end as the eyes, poke two holes and thread a pipe cleaner through to look like antennae.



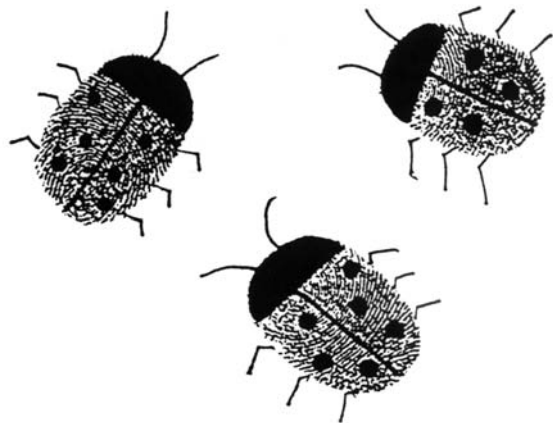
OR

Take an old brown, black or red sock and loosely stuff it with some newspaper. Tie the end closed. With yarn create three body segments. Make six small holes in the sock and thread pipe cleaners through to look like legs. Poke two holes in the head and thread a pipe cleaner through to look like antennae. Attach buttons for eyes.



Make Ladybugs

Make a ladybug out of your thumb print by pressing your thumb on a red ink pad or in a small amount of red paint. Then press your thumb on a sheet of paper. Let the ink or paint dry. After it is dry, use a black marker to draw a head, two antennae, six legs and 2-24 spots.



Just For Fun

Jokes and Riddles

What is the biggest ant?
An eleph-ant.

What did one insect say to the other
insect? *Stop bugging me!*

How do you start a lightning bug race?
On your mark! Get set! Glow!

What is the best year for grasshoppers?
Leap year!

What do butterflies sleep on?
Cater-pillows

Poems

A Dragonfly

When the heat of the summer
Made drowsy the land,
A dragonfly came
And sat on my hand.
With blue jointed body,
And wings like spun glass,
It lit on my fingers
As though it were grass.
---Eleanor Farjeon

Song Of The Bugs

Some bugs pinch
And some bugs creep
Some bugs buzz themselves to sleep
Buzz Buzz Buzz Buzz
This is the song of the bugs.
Some bugs fly
When the moon is high
Some bugs make a light in the sky
Flicker, flicker firefly
This is the song of the bugs.
---Unknown

Firefly

One night a little firefly
Was looking at a star
And said, but no one heard him,
"I wonder who you are."
Then looking for adventure
And brave as he could be
He lit his little lantern
And flew away to see.
---RAS

Butterfly Wings

How would it be
on a day in June
to open your eyes
in a dark cocoon,
And soften one end
and crawl outside
and find you had wings
to open wide,
And find you could fly
to a bush or tree
or float on the air
like a boat at sea...
How would it be?
---Unknown

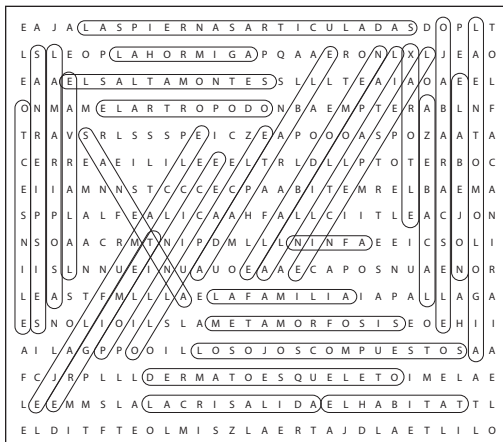
I Spy a Butterfly or Is It a Moth?

There are about 2,500 species of butterflies and moths in Illinois. Here are some differences between butterflies and moths that will help you identify them.

<u>BUTTERFLIES</u>		<u>MOTHS</u>	
Wings	Usually rest with wings straight up	Wings	Usually rest with wings flat
Antennae	Are thread-like with little knobs at the end of their antennae	Antennae	Have feathery or thread-like antennae without knobs at the ends
Body	Long and thin	Body	Short, plump and fuzzy
Habit	Usually fly during the day	Habit	Usually fly at night
Color	Usually brightly colored	Color	Usually dull colored

Answers

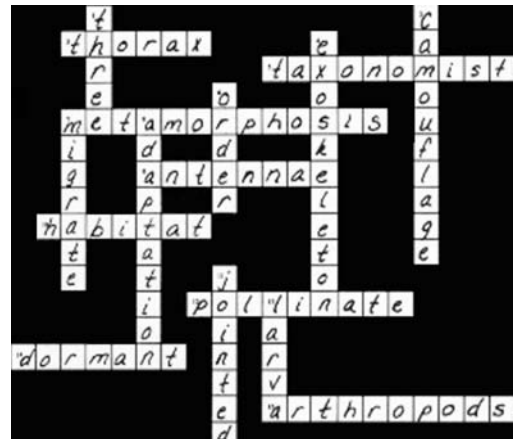
Page 4 – Insect-related Words



Page 18 – Unscramble These Insects

1. Fly
2. Bees
3. Fleas
4. Termites
5. Firefly
6. Ladybugs
7. Butterflies
8. Dragonflies
9. Walkingsticks
10. Katyids
11. Ants
12. Mosquitoes
13. Crickets
14. Wasps
15. Lice

Page 19 – Insect Crossword



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