State of Illinois
Rod R. Blagojevich, Governor

Illinois Department of Natural Resources

Wings, Stings and Leggy Things

Insects of Illinois

What good is an insect?

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

- are important pollinators of plants, especially fruits and crops.
- provide honey, wax and silk.
- help control other pests.
- provide food for many birds, fish, humans and other animals.
- are good indicators of water pollution.
- are used to treat diseases in people.
- help the quality of the soil by aereating it and recycling organic material back to the soil and the ecosystem.

Vocabulary

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

antennae - a pair of "feelers" used to help insects determine what is going on around them; one is located on each side of its head

arthropods - group of animals with jointed legs and hardened outer shells that includes the class of insects

camouflage - colors or patterns that conceal an insect by matching its background

chrysalis - stage in development between caterpillar and adult butterfly when a protective covering is formed around the young insect

cocoon - composed of silk fibers secreted by a larva; the protective case in which the larva will pupate

dormant - a state of inactivity, as during very cold weather

entomologist - one who studies insects

entomology - the scientific study of insects

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

habitat - the place where an animal lives

insectivorous - feeding on insects

larva - the young form of an insect with complete metamorphosis - "larvae" is plural

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

migrate - to travel from one area to another

molting - the shedding of an insect's hard outside skin so that the insect can grow larger

nymph - the young form of an insect with incomplete metamorphosis; looks like a miniature adult without wings

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

pupa - the stage of metamorphosis between the larva and the adult - "pupae" is plural

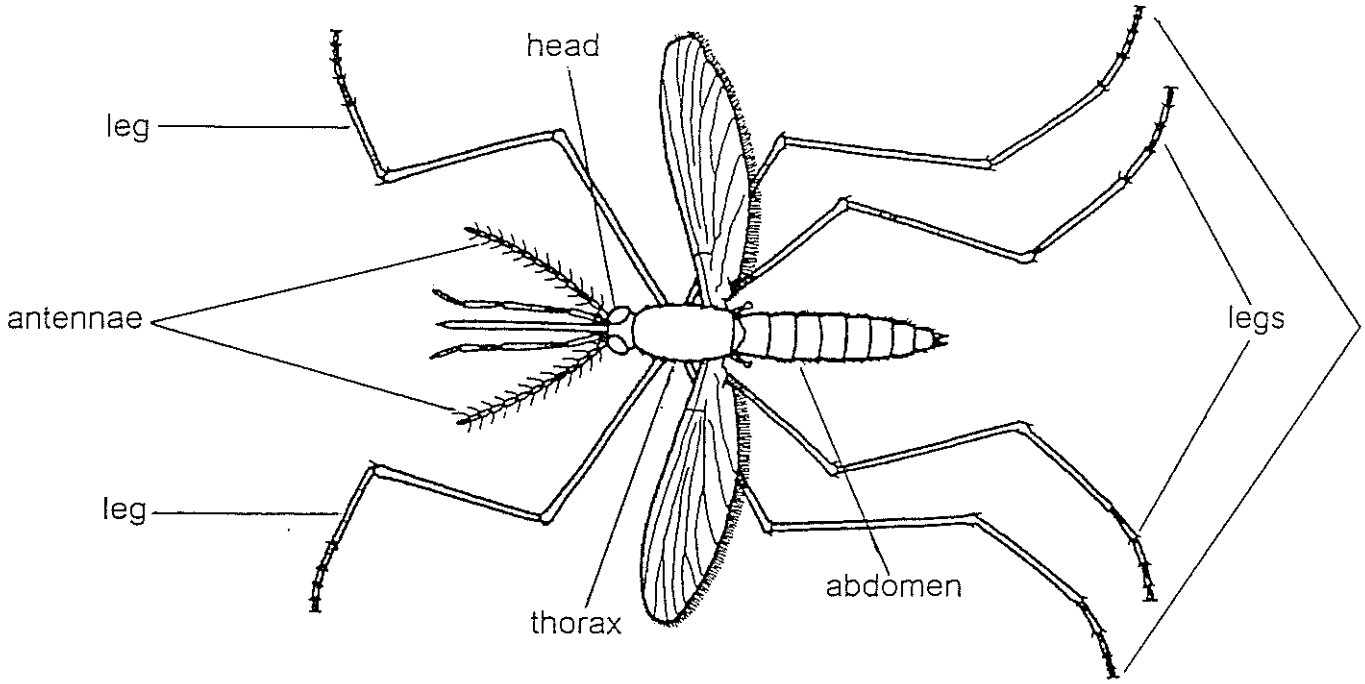
taxonomist - one who studies the way animals are grouped and how they are named

taxonomy - the scientific study of naming and grouping plants and animals

What is an insect?

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

MOSQUITO



How many chirps does a cricket chirp?

Due to the cricket's sensitivity to temperature, it will chirp more often in hot weather than cold. Only male crickets chirp; they do this by rubbing their wings together like a violin. 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 end up with after completing steps 1-4 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
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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

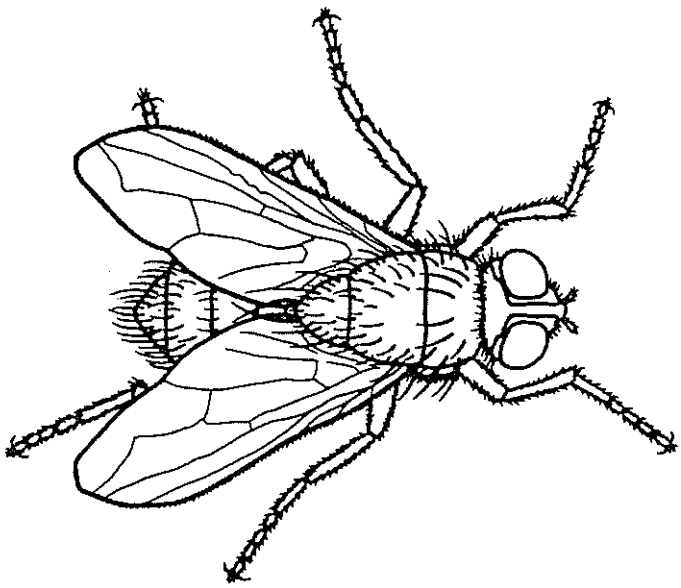
ABDOMEN
ADAPTABLE
ANT
ANTENNAE
ARTHROPOD
BEETLE
BUMBLE BEE
BUTTERFLY
CAMOUFLAGE
CHRYSALIS
COCOON
COMPOUND EYES
ENTOMOLOGY
EXOSKELETON
FAMILY
GRASSHOPPER
HABITAT
HEAD
INSECT
JOINTED LEGS
LARVA
METAMORPHOSIS
MIGRATE
MOTH
NYMPH
POLLINATE
PUPA
SIX LEGS
SPECIES
THORAX

Taxonomy

Taxonomy is the study or science of naming and grouping animals. Common names are generally used in everyday conversation, but they do not positively identify a particular species, due to many animals having more than one common name. Therefore, the process of naming and grouping insects helps scientists to discuss organisms and assure they are talking about the same exact species. Scientists categorize organisms by classifying them into groups arranged in order from general to specific relationships: kingdom, phylum, class, order, family, genus and species.

The complete classification of a common housefly is:

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



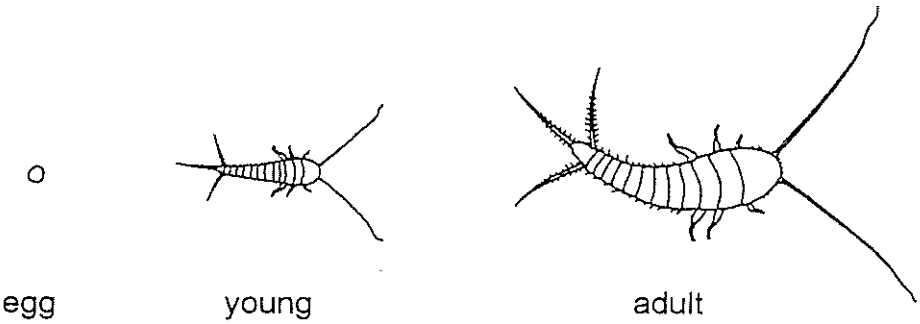
What is a scientific name?

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) 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. It must be underlined or in italics when written. Often a scientific name tells you something about the species or someone who studied it. 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

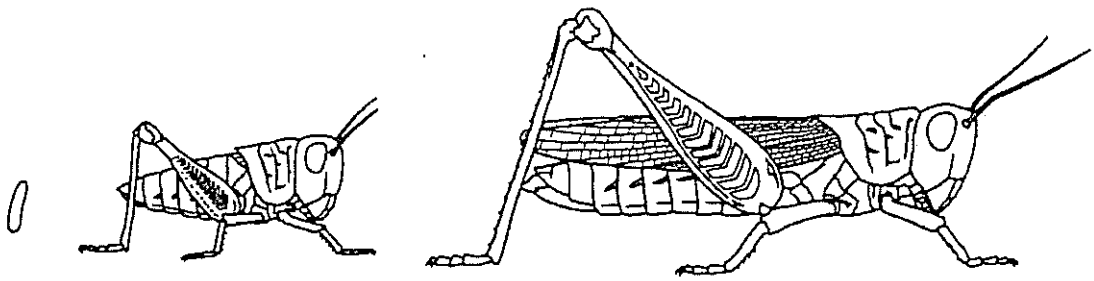
Metamorphosis is the change in shape and habits of an insect as it grows into an adult. Insects develop from an egg into an adult in three ways.

Simple Change - As the insect grows, only its size changes. For example, this is how a silverfish develops.



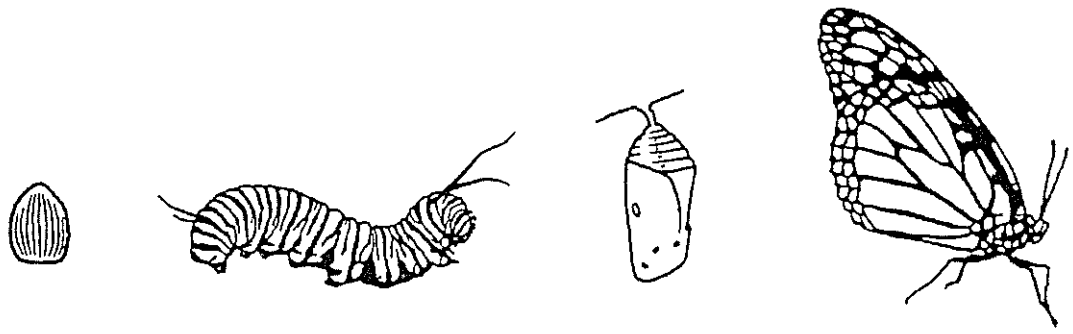
egg young adult

Incomplete Change - As the insect grows, it changes in size and develops wings. For example, this is how a grasshopper develops.



egg nymph adult

Complete Change - The adult insect looks very different from the young insect. For example, this is how a butterfly develops.



egg larva pupa adult

Insects often move, breathe and eat differently in each stage. These changes help insects survive changing food supplies, temperatures or harsh environmental 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 8 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 Hercules moth has a wingspan of over 11 inches?

*goliath beetles of equatorial Africa can be up to 4 ½ inches long?

*bees have to make about 80,000 trips to flowers to make one jar of honey?

*leaf cutter ants travel up to 1 mile to get to their favorite leaf, and then travel home carrying it on their back?

*in Africa and South America millions of army ants form a column and go on marches together? Their column can be almost 3 feet across and hundreds of yards long.

*approximately 1,000 new species of insects are named each year?

*the life cycle of an insect is less than 1 year in most cases?

*scientists estimate there are four million insects that have not yet been discovered?

*dragonflies have been known to fly 50-60 miles per hour?

*katydid's ears are located on 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	Insects
Eight Legs	Six Legs
2 main body segments	3 main body segments
No wings	Wings
Simple eyes	Compound eyes
No antennae	Antennae

* Did you know the diet of a spider consists mainly of insects?

House Fly

Musca domestica

Where does it live?

all over the world, where people/organisms live

What does it eat?

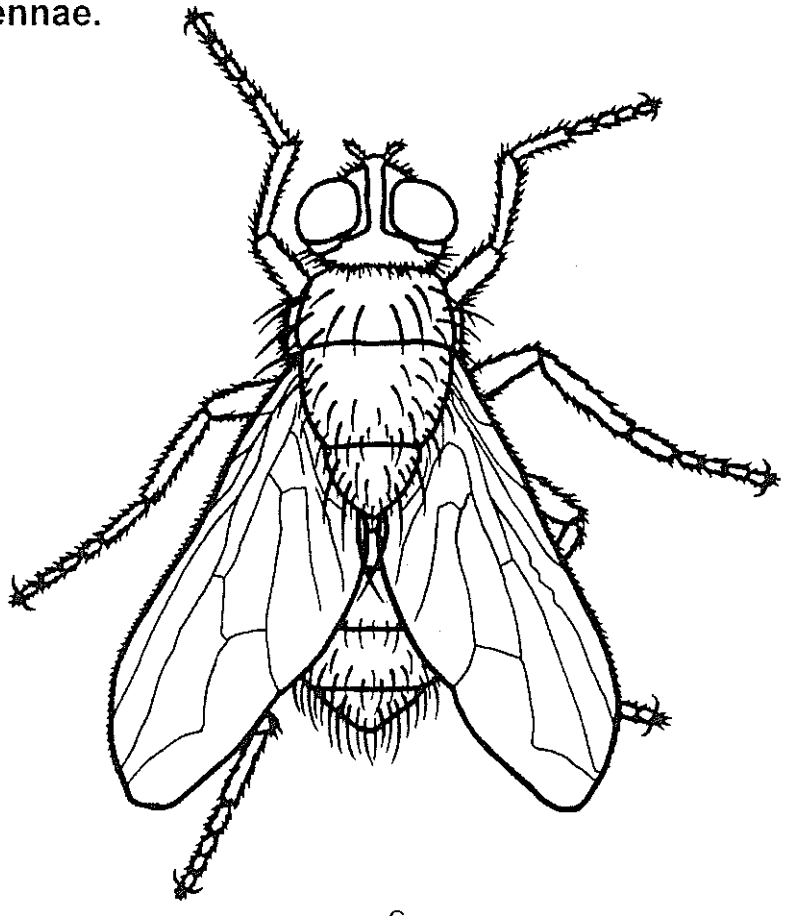
any uncovered food or waste

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

House flies can sense changes in airflow with their compound eyes and tiny hairs that cover their body. Flies have six 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...

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



Mosquito

Anopheles quadrimaculatus

Where does it live?

almost anywhere, especially near water and wooded areas

What does it eat?

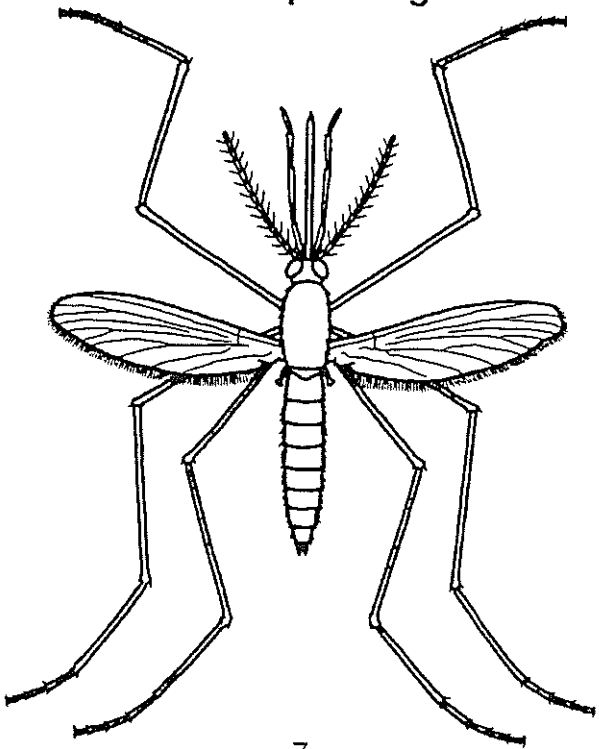
Males feed on nectar and plant juices. Females also eat nectar but are primarily blood suckers. Blood is a very important part of the female's diet in order to get the protein needed to develop and nourish eggs.

What adaptations does the mosquito have that help it survive?

The female mosquito bites a victim by using its piercing mouth parts to penetrate the skin. They inject their saliva into the blood, which has an anti-clotting factor. Blood flows freely through their sucking mouth parts.

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

Mosquitoes beat their wings 600 times per second which produces the whining noise you hear. Did you know when you get a mosquito bite that the bite itself does not itch? The itching is actually caused by a chemical found in the female mosquito's saliva, which remains in your body. 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?

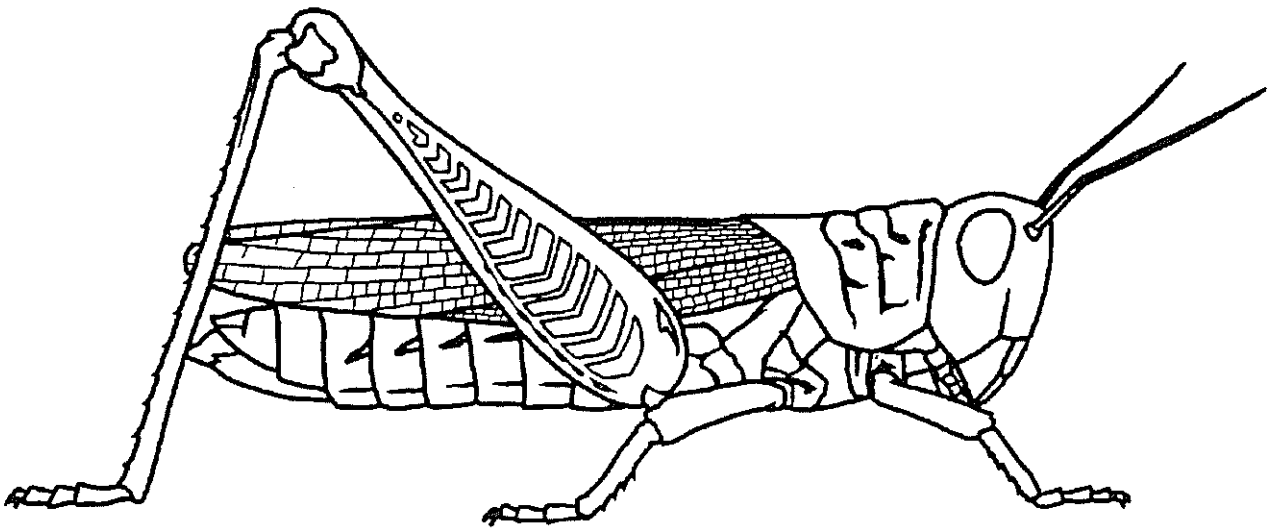
any type of plant (herbivore)

What adaptations does the grasshopper have that help it survive?

Grasshoppers have long strong legs for hopping and moving but are unable to fly very far. A green body allows the grasshopper to blend into its surroundings (camouflage) and hide from predators.

Here are a few facts you may not know about grasshoppers...

Adult grasshoppers only live one summer. In the winter, females lay their eggs in masses of 20-130 in packets below the soil. The young emerge in the spring.



Dragonfly

Libellula forensis

Where does it live?

near freshwater streams and ponds

What does it eat?

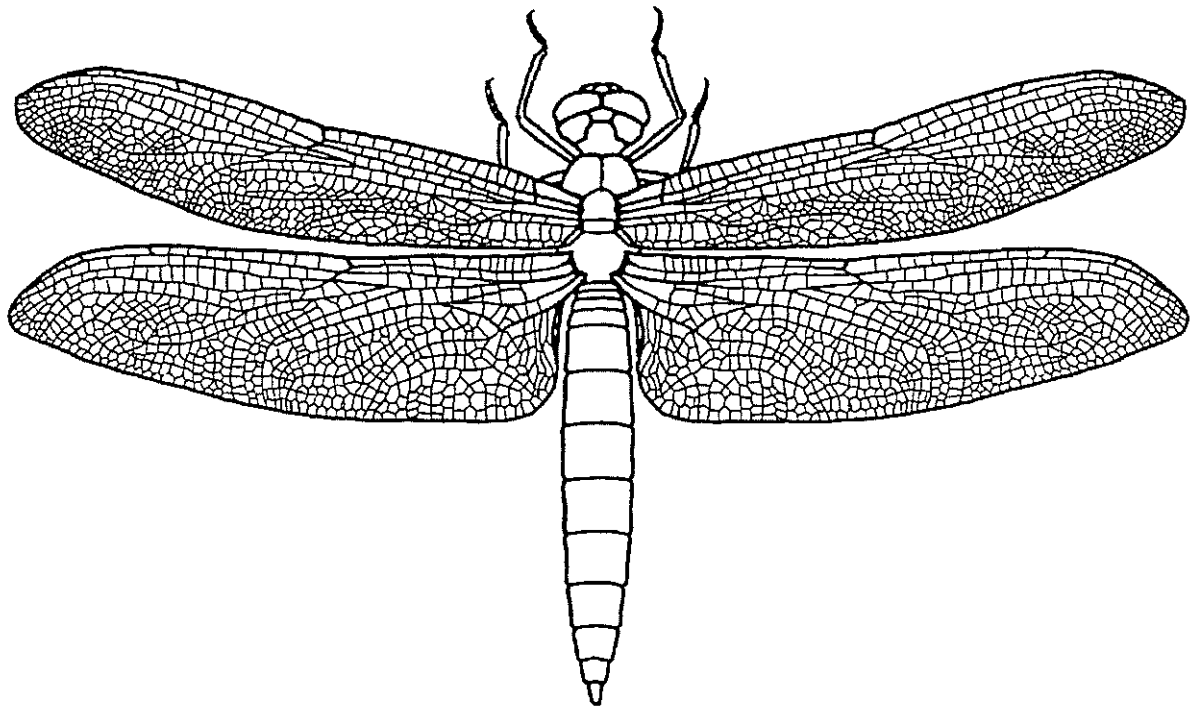
small insects

What adaptations does the dragonfly have that help it survive?

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

Here are a few facts you may not know about dragonflies...

Dragonflies are beneficial to humans because they consume large numbers of mosquitoes and black flies. They beat their wings more than 30 times per second and have been known to fly as fast as 60 miles per hour. Dragonflies can also catch prey while in flight.



Praying Mantis

Stagmomantis carolina

Where does it live?

on vegetation in warm, wooded areas or prairies

What does it eat?

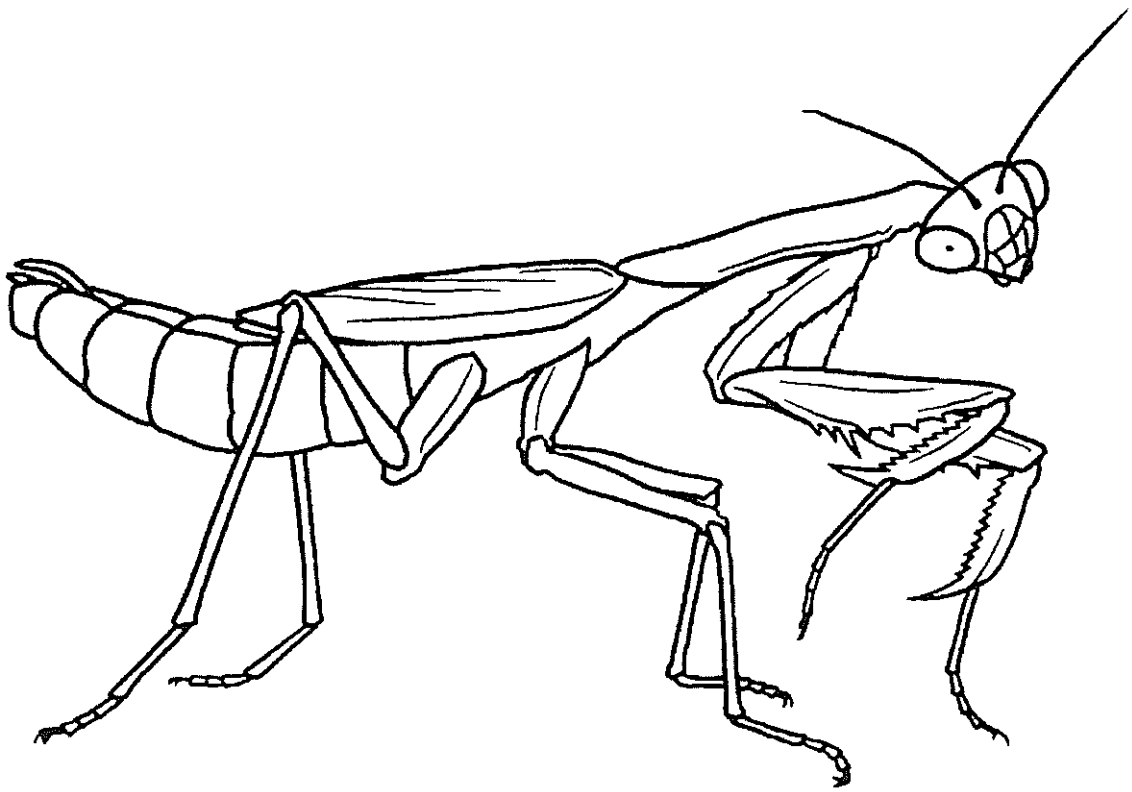
The praying mantis is carnivorous, eating all types of insects, including other mantises.

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

Praying mantises have spikes that cover their front legs and are used to help capture and eat prey. The mantis' green or brown color acts as camouflage and helps it blend into the environment.

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

It is the only insect that can turn its head all the way around (180°) and look over its shoulder for predators. Did you know that praying mantises will allow humans to stroke their backs?



Monarch Butterfly

Danaus plexippus

Where does it live?

open woodlands, spaces and pastures where milkweed grows

What does it eat?

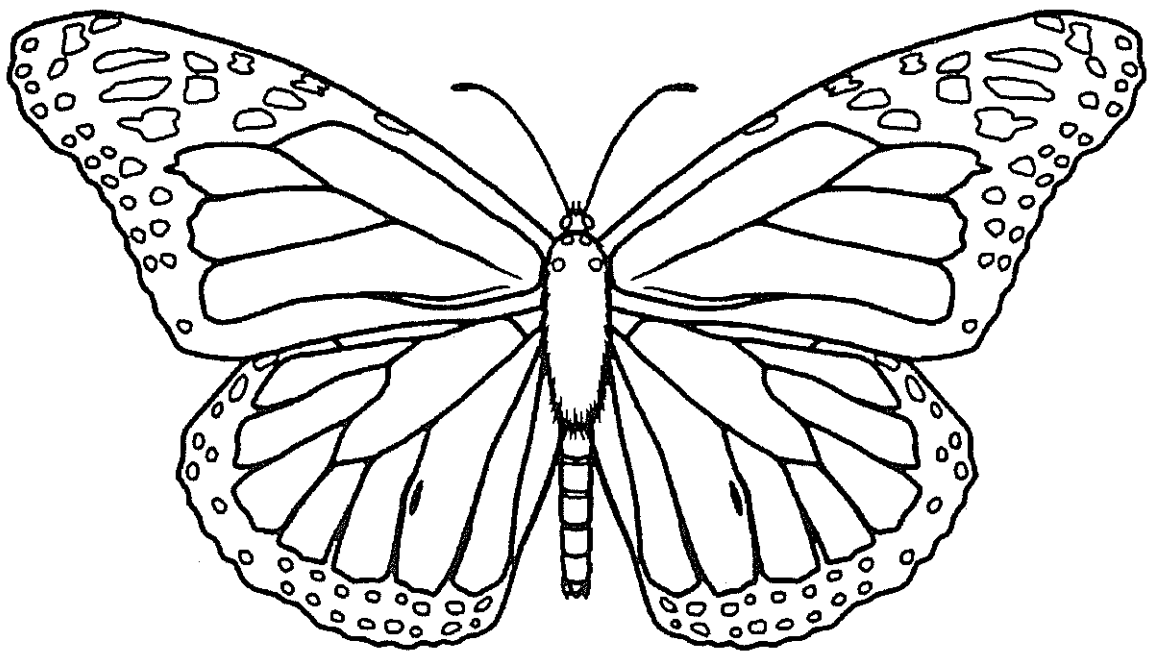
The larval stage of monarch butterflies, caterpillars, eat milkweed. Adult monarchs feed on flower nectar and dew.

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

Monarchs leave a bad taste in the mouth of those who eat them. Predators learn that the distinct coloration of the monarch is a warning sign. Their enemies will stay away, which helps the survival rate of the butterflies.

Here are a few facts you may not know about monarchs...

Monarchs migrate up to 3,000 miles to escape the winter weather and reach warmer climates. The monarch butterfly is Illinois' state insect.



Firefly

Photuris pennsylvanica

Where does it live?

in forests, on plants and trees

What does it eat?

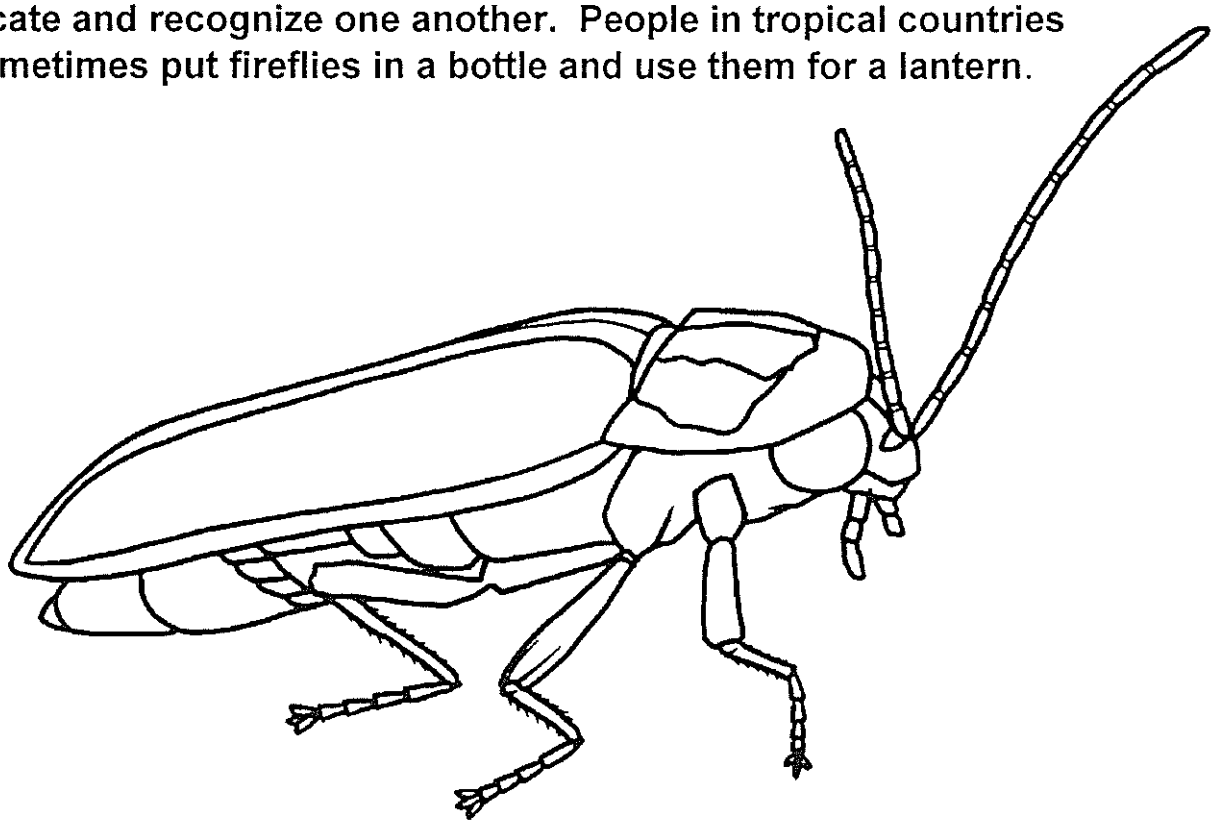
pollen and small insects, including other kinds of fireflies

What adaptations does the firefly have that help it survive?

Fireflies "twinkle" while they fly. The "twinkle" is a result of the light-producing organs that contain a chemical called luciferin. When luciferin combines with air, light reflects from the abdomen and causes the glow.

Here are a few facts you may not know about fireflies...

Each species of firefly has their own unique flashing pattern which is active only during a limited period of the night. Their flashing light is a part of the mating process which helps the males and females locate and recognize one another. People in tropical countries sometimes put fireflies in a bottle and use them for a lantern.



Honey Bee

Apis mellifera

Where does it live?

in a hive near flowering plants

What does it eat?

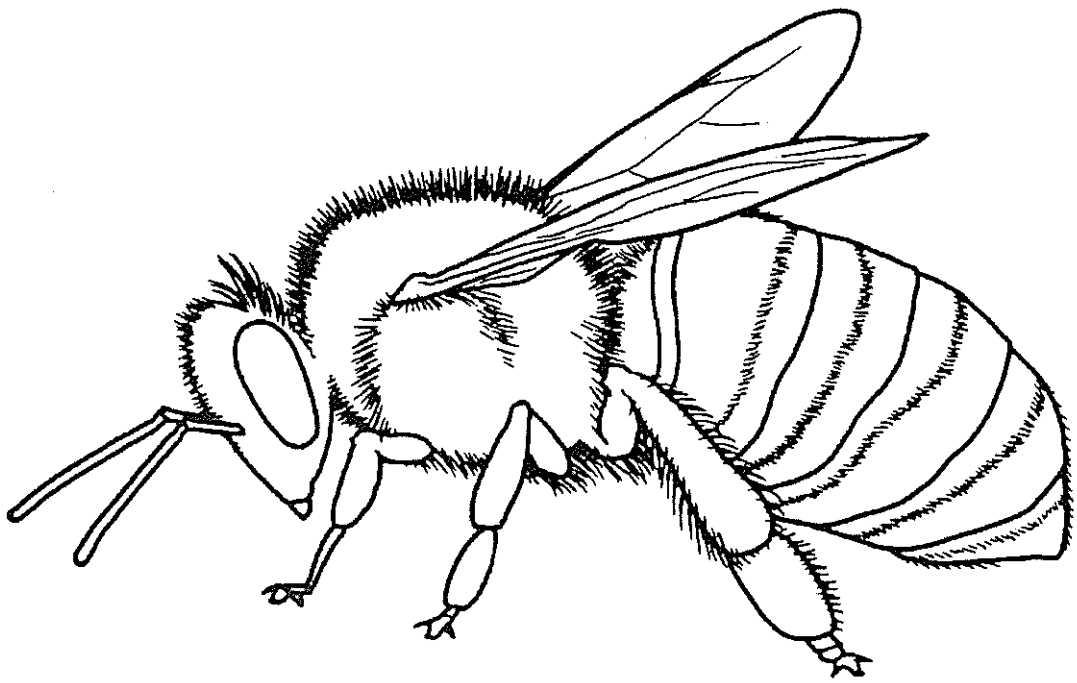
pollen and honey made from the nectar of flowers

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

Bees have the ability to turn the nectar from flowers into honey, which is stored in their hive. In the hives there is division of labor between the bees. Every bee knows its job and its importance to the survival of the colony.

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

Only female bees have stingers. Only one female, the queen, lays all of the eggs for the colony. She will deposit 1,500 eggs a day! Honey bees have flown on the space shuttle with the astronauts.



Water Strider

Gerris remigis

Where does it live?

still surface of the water of ponds and streams

What does it eat?

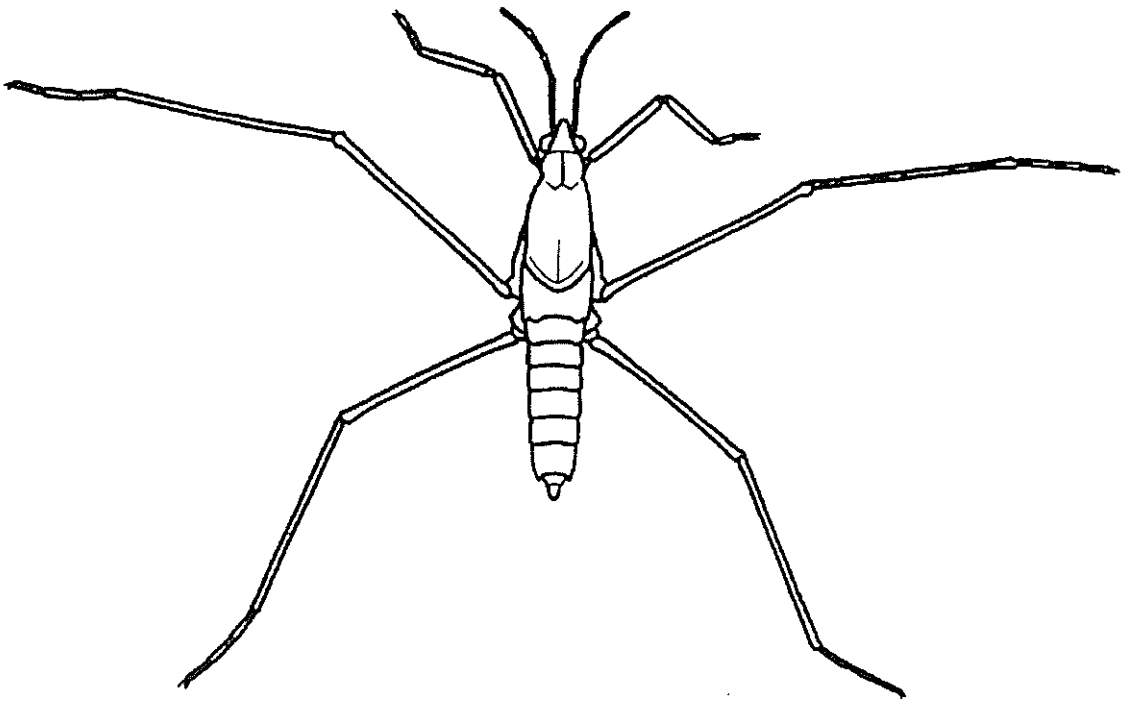
Water striders feed on live and dead insects (insectivorous) and other aquatic organisms.

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

The front legs of water striders 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 water striders...

Water striders not only glide on still water but are also capable of walking on the surface of running water. Due to their 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 and yards, especially in gardens and on plants

What does it eat?

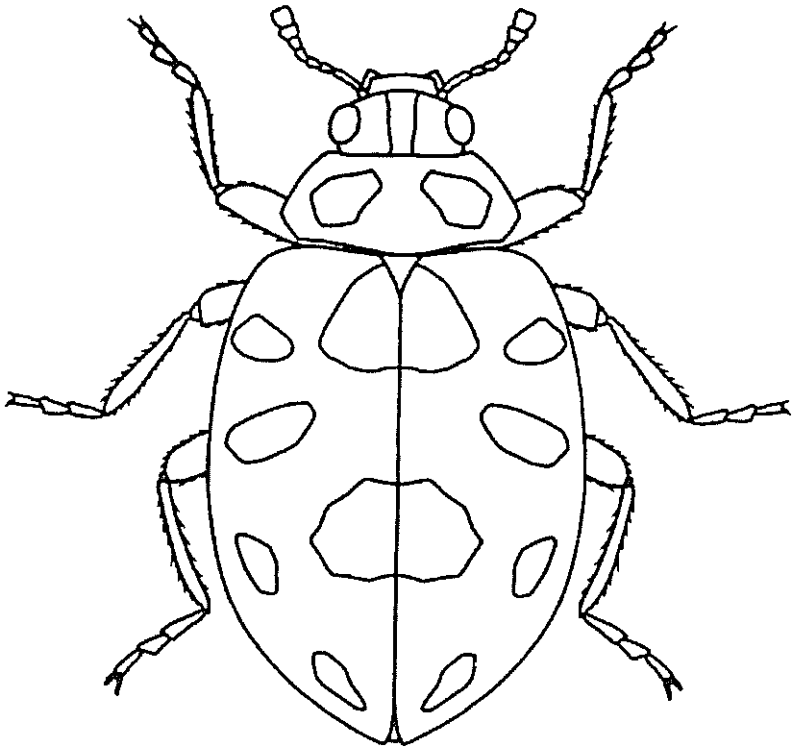
Ladybugs eat mostly aphids, and other garden pests. As fall approaches, it may eat pollen which supplies fat for hibernation.

What adaptations does the ladybug have that help it survive?

Ladybugs have hard shells that protect their wings and deter predators from eating them. Ladybugs also "play 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 ladybugs...

Most people know this insect by its nickname, the ladybug. Entomologists refer to it by the technical name, ladybird beetle. During the winter, ladybugs hibernate in protected hiding places such as tree stumps, cracks in wood or ground-covering vegetation. They 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

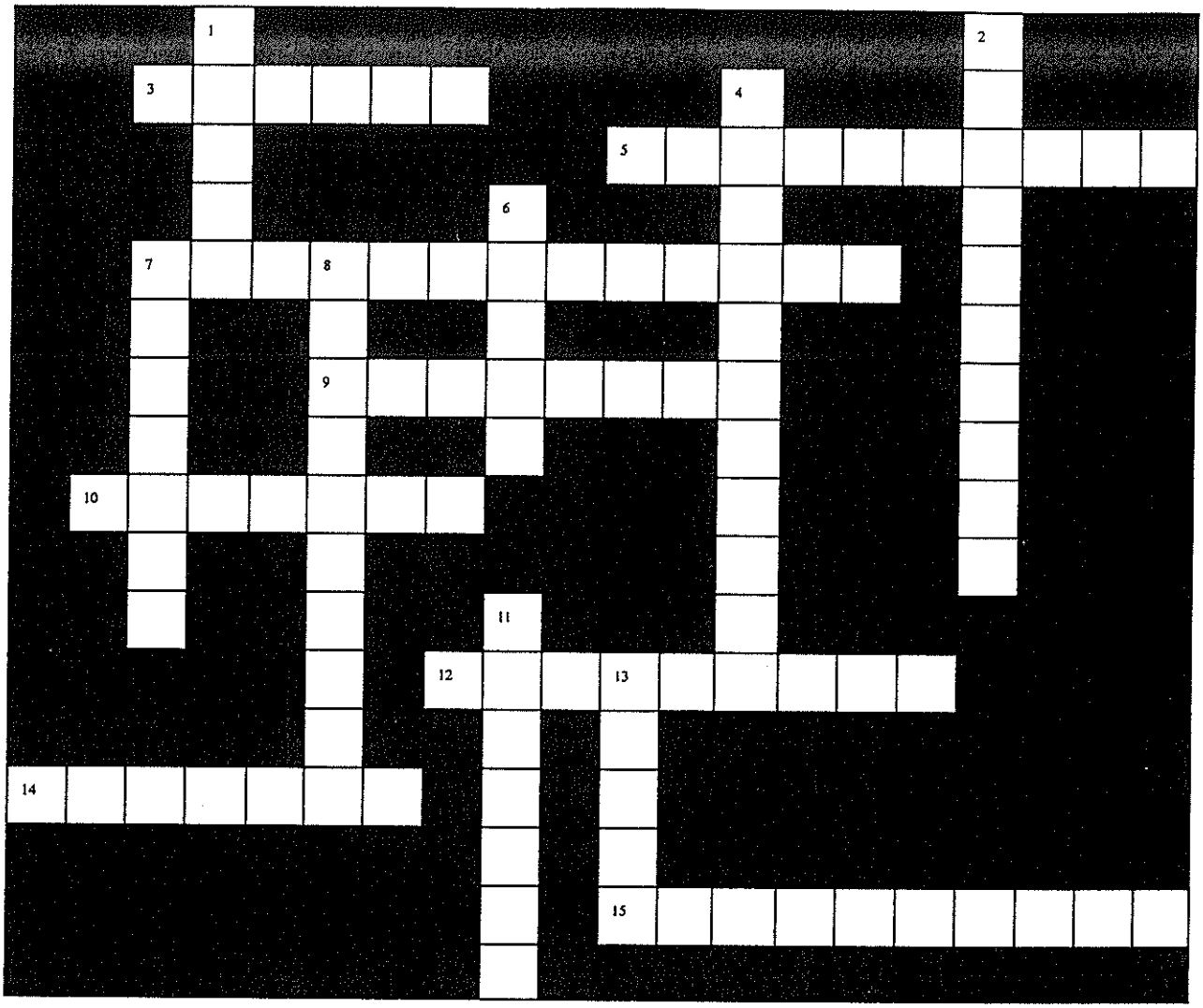
12. _ _ _ _ _ _ _ _ _ _ live everywhere people do, and if you don't wear insect repellent their bite will cause an itchy red bump. u s m o q s t i e o

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 human's heads 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 that 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 insects 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 hardened bodies and includes insects.

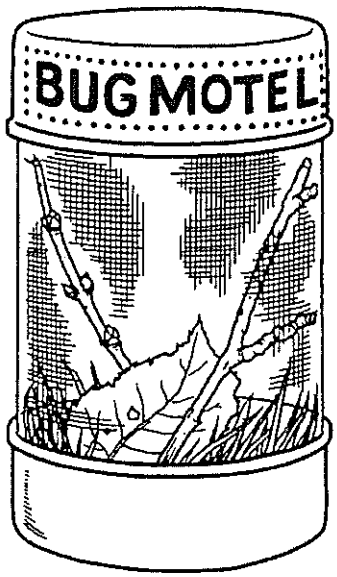
DOWN

1. An insect has _____ pairs of legs.
2. When an insect has a certain color or pattern that lets it blends 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 survive.
11. An insect's legs are _____.
13. The young form of an insect is known as a nymph or _____.

Activities You Can Do At Home

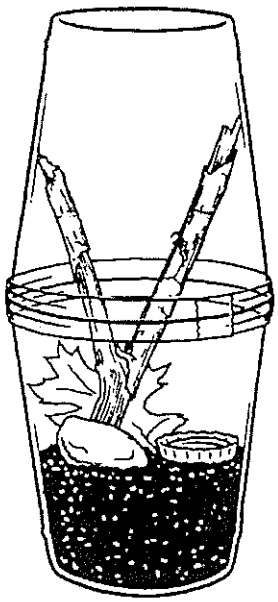
Make a Bug Motel

A bug motel can be used as a temporary home for bugs. This will help you observe bugs 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 by six inches 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.



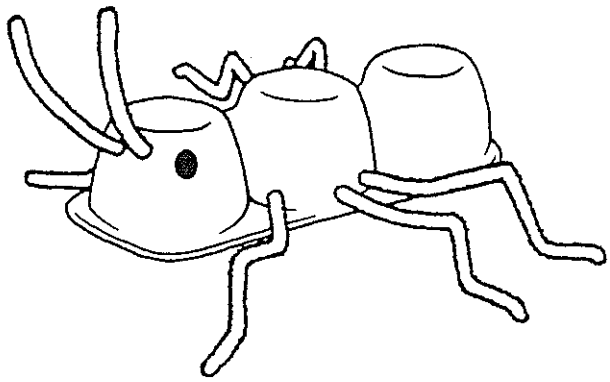
or

Fill a clear plastic cup half full with dirt. Add a stick, leaf, rock and a bottle cap full of water to the cup. Put in the insect you are going to observe and then tape an empty plastic cup over the first cup. Observe your insect and then return it to its natural environment.



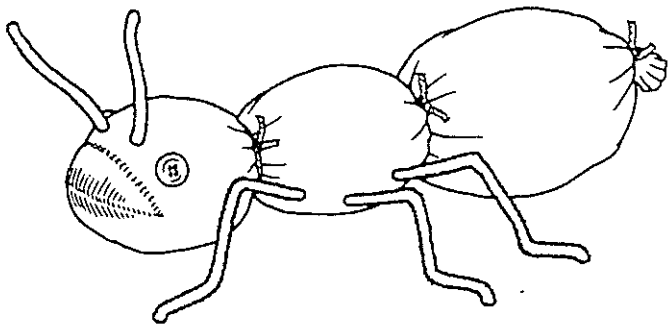
Create an Ant

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.



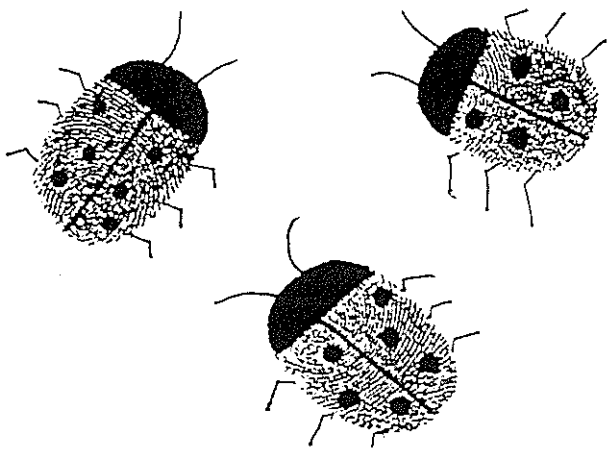
or

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 & Riddles

What is the biggest ant?
An eleph-ant.

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

I'm not your sister or your mother,
But I'm married to your father's brother.
I am an _____.

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...

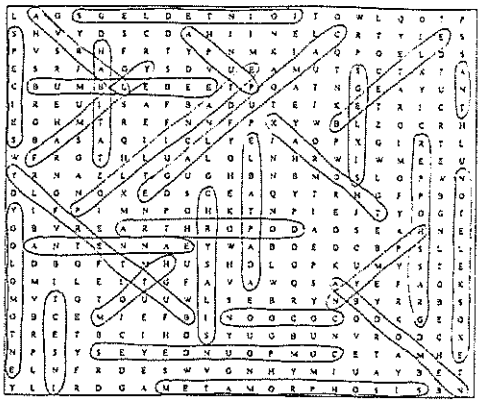
How would it be?
---Unknown

I spy a butterfly or is it a moth?

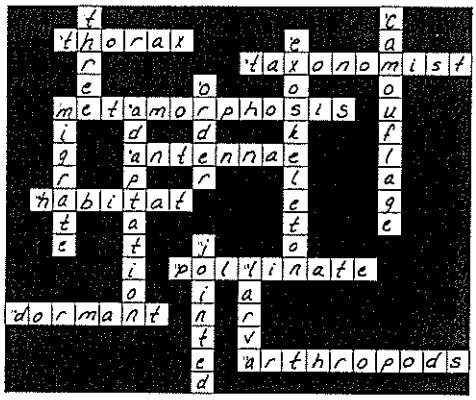
There are several species of butterflies and moths in Illinois. Here are some differences between butterflies and moths that will help you identify which is which.

	Butterflies	Moths
Wings	Usually rest with wings straight up	Usually rest with wings flat
Antennae	Have little knobs at the end of their antennae	Have feathery or thread-like antennae
Body	Long and thin	Short, plump and fuzzy
Habit	Usually fly during the day	Usually fly at night
Color	Usually brightly colored	Usually dull colored

Answer Keys:



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



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