

# Insects & Spiders

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Parents and teachers: Please read the fact sheets aloud, to encourage children to learn more exciting facts about insects, spiders, and other arthropods.

# When I Grow Up

**When I grow up, I want to be something very interesting.  
The job I'll do will help a lot of people,  
and I'll like the work that I do.  
Each day will be adventurous,  
and I'll strive to learn a lot.  
Then I'll share what I know and my knowledge will grow.  
It's the perfect, perfect job!**



*I think I would like to be an entomologist! It must be fun learning about insects and spiders and other arthropods, like centipedes. Entomologists study insects that damage crops and come up with ideas on how to prevent this. They learn about the praying mantis or the ladybird beetle, which help get rid of insect pests. If you become an entomologist, you could travel and study different insects all over the world.*

Now science is important,  
so I'll study hard when learning about biology.  
Experiments in chemistry will  
help me learn to develop good hypotheses.  
Then I'll read and I'll read and I'll read some more,  
and I'll share just what I learn,  
'cause when I grow up I want to be  
something very interesting.

**(Chorus)**



**Yes, I'll share what I know and my knowledge will grow.  
It's the perfect, perfect job!  
The perfect, perfect job!**



# What Is An Insect?

*Do you know what an insect is? Is a spider an insect, or a centipede? Although you might think that they are insects, they're not. Actually, insects have many characteristics that other animals do not have. Insects belong to a group of animals called arthropods. They have jointed legs and a hard body covering. While a person's skeleton is on the inside of the body, an insect's skeleton is on the outside. And a typical insect has six jointed legs and three body parts. Hey, this is a lot to remember. Listen to this song; it will help you remember facts about insects.*

What is an insect? Can you see?  
Look at a grasshopper or a bee.  
Three body parts, let's name them all:  
head, thorax, abdomen, I recall.



What is an insect? Can you see?  
On an insect's head are three main things:  
two antennae, and their eyes,  
a mouth that's even the perfect size.

**Insects, insects, they lay eggs.**  
**Most insects have six jointed legs.**  
**They help our trees and plants to grow tall.**  
**They're every color, some big, some small.**



What is an insect? Do you know  
that some eat plants to help them grow?  
Most adults have four wings to fly,  
like the beautiful monarch butterfly.

What is an insect? Can you see  
how important insects are for you and me?  
They carry pollen from flower to flower,  
and dead animals they help devour.  
**(Chorus)**

**Insects, insects, they lay eggs.**  
**Most insects have six jointed legs.**  
**They supply food for animals to eat.**  
**Insects make our world complete.**



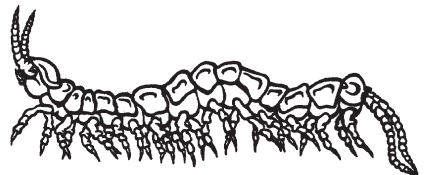
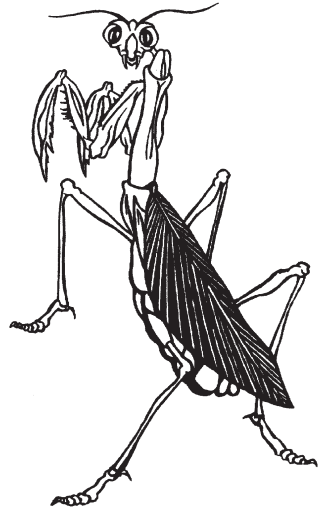
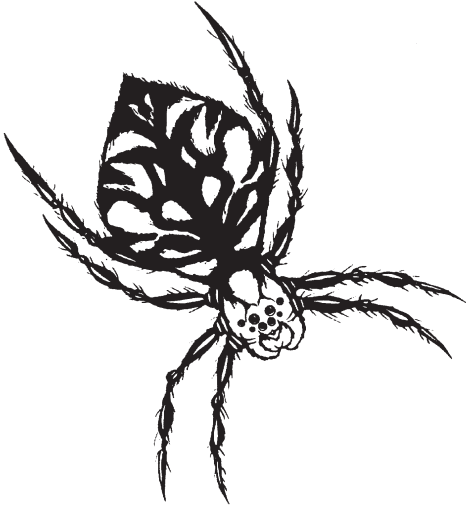
# Facts About Insects



- An insect belongs to a group of animals called **arthropods**. Arthropods have jointed legs and a hard exoskeleton.
- Insects are **invertebrates**, meaning they do not have backbones.
- The word **insect** means “cut into.”
- Insects have three main body parts: head, thorax, and abdomen. Grasshoppers are typical insects.
- Many adult insects have two wings, but some have four. There are even a few insects that do not have any wings.
- An insect usually has six jointed legs and one pair of antennae.
- Most insects have two kinds of eyes. **Simple eyes** help the insect see light and darkness, while **compound eyes** are made up of thousands of tiny eyes that help the insects see details.
- Insects do not use lungs to breathe. Instead, they breathe through **spiracles**, which are tiny holes that lead into tubes along the insect’s body. Each tube has several branches to carry the oxygen throughout the insects’ body.
- There are over a million different species of insects. Insects live on land, in the water, and underground. Insects seem to live everywhere on Earth. More and more species are discovered each year.

# Can You Find The Insects?

Circle all of the insects.



# What Kind Of Mouth Do You Have?

*Insects are so interesting. Did you know that insects don't have teeth? Instead, they have special mouths that help them to eat. Mosquitoes have mouths that pierce like hypodermic needles. Flies soak up liquids like sponges. Moths and butterflies have mouths made for sucking, while beetles crush and chew their food.*

Mosquitoes like to land on you. They try quickly to eat some food by piercing through your skin to get the liquid before you get upset.

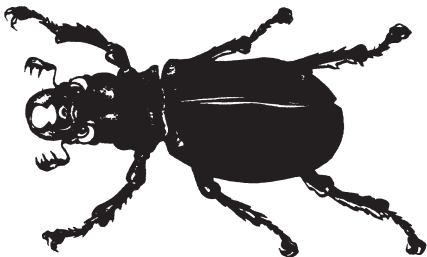
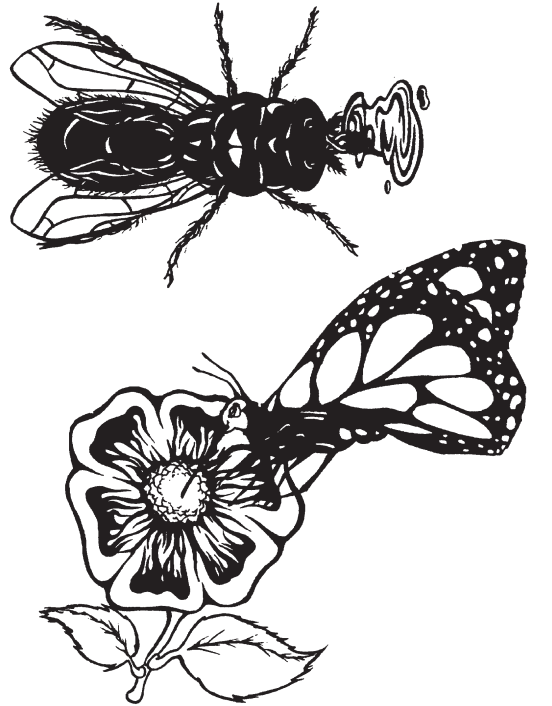
Now moths and butterflies, they use a mouth that sucks; they do not chew. Like a straw they suck the nectar from the flowers, for teeth they have none.

**Sucking, piercing, crushing, or soaking water up from the floor are ways that insects eat their food. Insects sure have special tools.**

A fly has a mouth with a broad tip for soaking up liquids. They just dip their mouth into water like a sponge. Now, doesn't that sound like lots of fun?

Now tiger beetles use their jaws to cut and chew their food, because an insect does not have sharp teeth. They move their jaws sideways to eat.

**(Chorus)**



# Ants In My Pants

As I was sitting 'neath a tree,  
I felt the strangest thing—  
an itch of sorts, or a tickle that  
started 'round my knee.



So I looked down. You wouldn't believe,  
they were crawling up so fast.  
By golly, I believe I'm getting  
ants in my pants!



**(Chorus 1:)**

**Help! Help! Ants are crawling up inside my pants.  
It tickles, icky, icky ickles, ants are in my pants.  
They're little itty bitty things. But, oh, they made me jump  
and scared me so that then, I guess, I started to hiccup.**

So then, I had the hiccups  
while the ants were crawling 'round.  
An answer to my problem,  
at that time, I had not found.



I quickly ran inside my house  
and shut the large screen door,  
whipped down my pants  
and all the ants started crawling on the floor.

**(Chorus 2:)**

**Help! Help! Ants are crawling up and down my floor.  
I hope they realize their home is out my large screen door.  
They're little itty bitty things. I know not what to do.  
I thought that ants appeared only at tasty barbeques.**

I do admit I was relieved,  
for the ants I had removed.  
It's funny though, ants have a way  
of making someone groove.

For pants with ants will make one dance,  
this I will guarantee.  
For dance I did throughout this  
whole ant catastrophe!

**(Chorus 1)**





# All About Ants

- \* Ants are often called “social” insects because they work together in colonies. In an ant colony, there are many jobs to do. The male’s job is to fertilize the queen; after that, he dies. The queen is the head of the colony, and her job is to lay the eggs. The worker ants gather food, guard the home, care for the young, tend to the queen, and perform any other job that is needed.
- \* There are many components in an ant nest. The queen has her own area for laying eggs. Once the eggs are laid, the worker ants carry them off to the nursery, where they are cared for. There is also a place for sick ants, and a place to store food.
- \* Did you know that an ant has two stomachs? One stomach is used to store food for other ants. The other stomach is used to nourish the ant’s own body.
- \* Ants use their antennae to pass food and messages to each other. If you see ants that look like they are kissing, this is what they are actually doing.
- \* Some female ants have wings, and once a year these female ants will mate with the males. At this time, they both leave the nest, fly into the sky, and mate. After they have finished mating, the males die and the females return to the ground to start a colony. The female ant sheds her wings at this time, never to fly again.
- \* The female ant digs a tunnel in order to start a nest and lay her eggs. She takes care of her eggs as they develop from grubs to pupae. Once they are ready to hatch, she helps tear open the cocoon for the first group of worker ants. After this point, the worker ants take care of the queen and each other.



# I'm A Fierce Hunter

I have a slender body.  
I'm known for praying arms.  
If you are a beetle,  
you might become alarmed.

For if you come too close  
and I'm hungry for a snack,  
I'll quickly use my powerful arms  
and then I will attack.

**Who am I?**

**Can you find me in a tree?**

**My color camouflages well  
against green leaves.**

**Who am I?**

**A praying mantis, that is me.**

**I'm a fierce hunter.**

**Other insects would agree.**

In early spring, I push and wiggle  
through an egg case.

With lots of other siblings,  
I'm feeling out of place.

We all remain attached  
by two fine silk threads  
until we free our legs,  
as the membrane we now shed.

Now that I am growing strong,  
I have an appetite  
for moths and bees and butterflies.  
I hunt them day and night.

I grow throughout the summer.  
My exoskeleton I shed.  
I sit upon a branch  
as my wings I now outspread.

**(Chorus)**

I'm swollen with eggs  
as autumn slowly draws near.  
I patiently await for  
a male mantis to appear.

My partner doesn't know that  
my supper he will be,  
for when we're finished mating  
I will eat my company.

It's my turn to lay my eggs  
and make an egg case.  
A sturdy branch will keep  
my babies nice and safe.

My life is now complete  
as the fall wind starts to blow.  
Next spring, my baby mantises  
will begin to grow.

**(Chorus)**



# Facts About Praying Mantises

- ❖ A praying mantis emerges from an egg case in early spring with about 400 siblings. Each of those siblings is connected to the egg case by two fine silk threads. The young mantises wiggle free from their protective covering and climb onto a nearby branch.
- ❖ As mantises grow during the summer, they **molt** many times. This means that they shed their outer exoskeleton. The praying mantis goes through **incomplete metamorphosis** as it grows from nymph to adult. This means that although the young mantis looks different from the adult mantis, it still resembles its adult appearance. (In contrast, the butterfly goes through **complete metamorphosis** because its change is so extreme from egg to larva to pupa to adult.)
- ❖ A praying mantis is a fierce hunter. Praying mantises are meat eaters. They have even been known to eat small birds, lizards, or frogs. A praying mantis has keen eyesight, which helps it hunt.
- ❖ Praying mantises eat a variety of insect pests that entomologists try to control. They help clean up the Earth by controlling damaging insects.
- ❖ As autumn approaches, the female mantis will be swollen with eggs. The smaller male mantis will approach from behind to mate with the female. Often, the female will eat her partner during or after the mating process. The female will then start to make her own egg case on a tree branch. The adult female mantis only lives until late autumn, but the eggs will be secure in the egg case all winter. They will develop into young mantises in the spring.



# What A Change!

A butterfly finds a leaf,  
then lays her eggs.  
Caterpillars start to hatch  
with lots of little legs.

Soon they'll start to eat  
some green, sweet, tasty leaves.  
The caterpillar now is big  
and starts to shed its skin.

The caterpillar molts and molts  
as it grows big.  
It wants to form a chrysalis,  
and so it finds a twig.

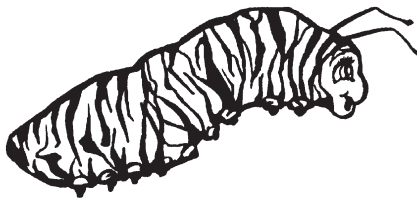
It loses all its legs,  
and stays in the same place.  
A cocoon it spins around itself  
as it starts to change.

It stays inside the chrysalis,  
patiently waiting.  
When it is time to emerge,  
it makes an opening.

It hangs upside down,  
pumps blood all around into the wings.  
You wouldn't believe—  
the change is quite extreme.

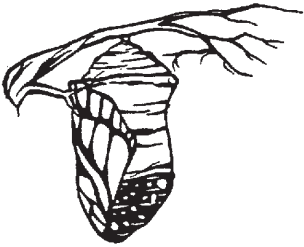
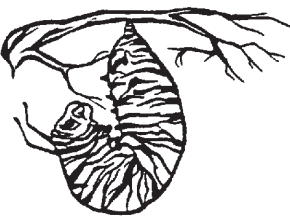


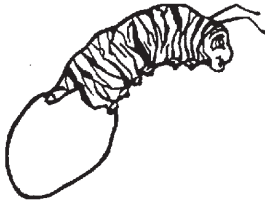
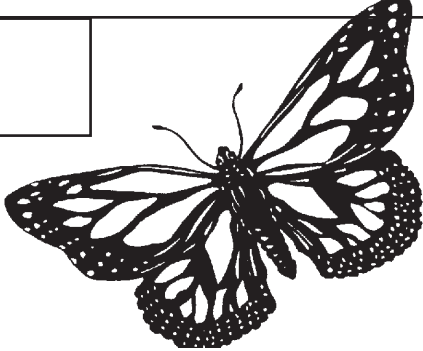
The butterfly's wings must dry  
before it can fly.  
It's really quite a miracle,  
this you can't deny.

From a simple egg  
to a caterpillar with legs,  
this butterfly arrives one day.  
Then it flies away.



# Metamorphosis

**Metamorphosis** means "to change form." The change from a caterpillar to a butterfly is a "complete metamorphosis." Put the correct number (1-6) in each box to show the order of how a caterpillar turns into a butterfly.

# Fireflies, Won't You Come Out Tonight?

**Fireflies, won't you come out tonight,  
come out tonight, come out tonight?  
Fireflies, won't you come out tonight  
and dance by the light of the moon?**

The firefly is not a fly,  
not a fly, not a fly.  
The firefly is not a fly,  
but a beetle. My, oh my.

The firefly's light is cold,  
light is cold, light is cold.  
The firefly's light is cold,  
not hot like a light bulb.

**(Chorus)**

Look at the flying firefly,  
firefly, firefly.  
Look at the flying firefly.  
He's flashing his bright light.

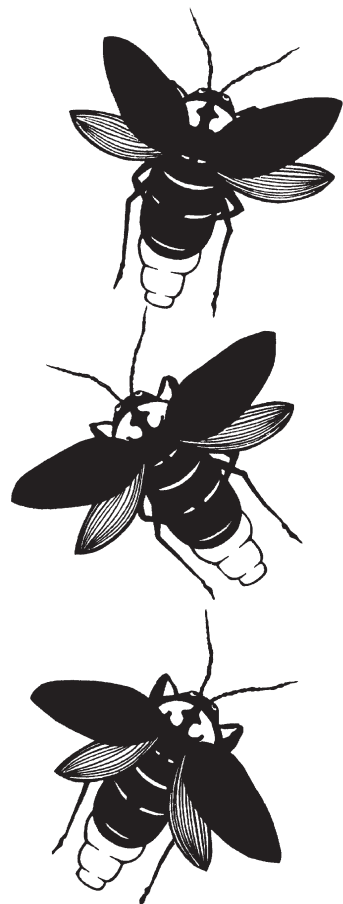
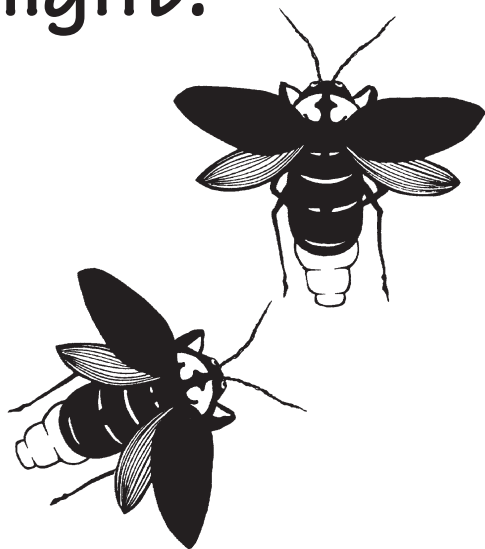
He hopes to find a pretty mate,  
pretty mate, pretty mate.  
He hopes to find a pretty mate.  
She's flashing in the grass.

**(Chorus)**

She flashes light and sends a code,  
sends a code, sends a code.  
She flashes and she sends a code  
from the wet, tall grass below.

He flies to meet his mate below,  
mate below, mate below.  
He flies to meet his mate below,  
all from her special code.

**(Chorus 2x)**



# Pass The Honey, Please

Did you know that honeybees make food to eat?  
Did you know that honeybees make food to eat?  
Did you know that honeybees—they make honey? What a treat—the only insect that makes food for us to eat.

Now a honeycomb the worker bees will build.  
Now a honeycomb the worker bees will build.  
Now a honeycomb the worker bees will build. It uses wax.  
Six-sided cells are made to store those little eggs.

*A honeybee goes through four different stages before it becomes an adult. It takes only twenty-one days for the bee to develop from an egg to an adult. The queen bee is fed a special "royal jelly" from the worker bees, which helps her lay up to 2,000 eggs per day.*

Now the queen her only job is to lay eggs.  
Now the queen her only job is to lay eggs.  
Now the queen her only job is to lay eggs. She lays a lot.  
The workers feed and groom the queen as she lays eggs.

From egg to larva, pupa, then adult.  
From egg to larva, pupa, then adult.  
From an egg it develops into a larva, then a pupa.  
From pupa to adult it then will grow.

*Honeybees are really amazing. They live and work together in colonies to make honey. They are the only insect that makes food for humans to eat. Bees are also important because they carry pollen from flower to flower. Without bees, we would have fewer flowering plants and fruit.*

Collecting pollen from the flowers bees will do.  
Collecting nectar from the flowers bees will do.  
Collecting pollen and sweet nectar from the flowers,  
then they'll fly back to the hive to store the pollen in the cells.

It regurgitates the nectar from the crop.  
It regurgitates the nectar from the crop.  
It regurgitates the nectar for the other bees to eat.  
The rest is stored and turns to honey in the cells.



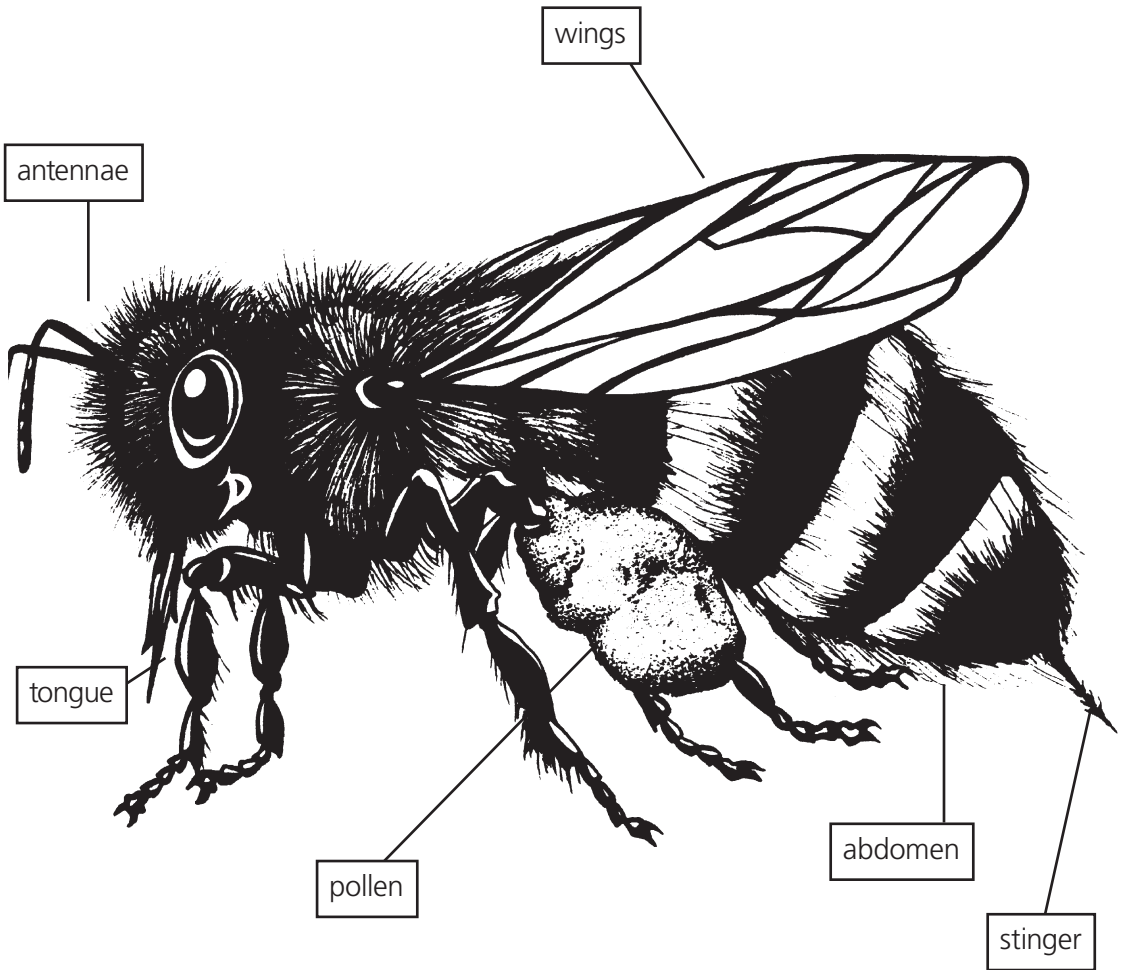
# The Important Honeybee

- ❁ Honeybees live in groups called **colonies**. In the colony, there are worker bees, male drone bees, and a queen bee. The worker bees tend to the queen bee, make new honeycombs, feed the young, care for the sick bees, gather food for the hive, and do any other job that needs to be done.
- ❁ The only job of the male drone bees is to mate with the queen. They usually mate with a queen from another colony. After they mate, the male will die. Any male drone bees that do not mate will die when winter comes. The worker bees do not feed the drones, and even drive them out of the hive in the winter.
- ❁ The queen bee has an important job. She lays all of the eggs. The worker bees tend to her every need. They feed her, groom her, and take care of the developing eggs. This allows the queen bee to lay up to 2,000 eggs a day.
- ❁ Worker bees collect pollen and nectar from flowers. Pollen sticks to the bees' hairy bodies as they move around the flower. The bees form a ball of pollen on their hind legs and carry the pollen back to the hive.
- ❁ The bees eat the sweet nectar from the flowers. It gives them energy. Then, they fly back to the hive and regurgitate the nectar in order to feed the other bees. Once all of the bees are fed, they store the nectar in the honey cells. Chemical changes occur as the nectar dries and turns into honey.
- ❁ Honeybees are very important. They are the only insect that makes food that humans eat. They carry pollen from flower to flower. Without bees, we would have fewer flowering plants and no fruit.





# Diagram Of A Honeybee



# What Is A Spider?

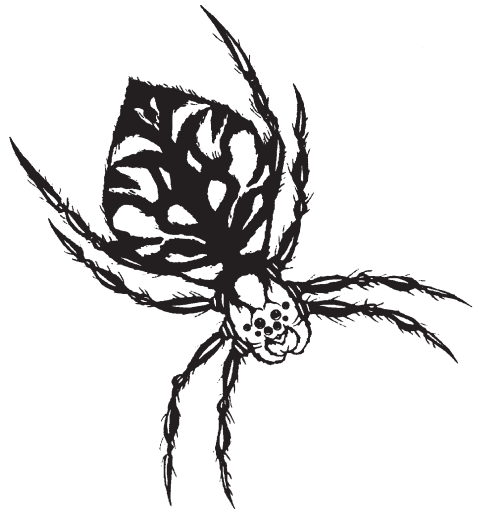
Did you know that eight legs a spider has?  
They are not insects, but in a special class.  
For they are called **arachnids** with two body parts.  
How can we tell these animals apart?

Now let's look at a spider, and you will see  
that a spider has eight eyes, but he has no wings.  
A cephalothorax and the abdomen  
are parts of our little spider friend.

Listen, and I'll tell you just how a spider eats.  
Once the prey is captured, the meal won't retreat  
for venom is injected. The prey is paralyzed,  
then quickly the prey becomes liquidized.

Now, spiders they have no teeth with which to eat.  
Like sucking from a straw, their meal becomes a treat.  
It might take several hours just to liquefy a fly,  
but well worth the wait for the spider's appetite.

Silk glands in the abdomen a spider will rely on.  
Although they all don't spin webs, but silk they all supply.  
Spiders are important, for they prey on insect pests  
that damage crops and do things that farmers detest.



# Facts About Spiders

- ◆ A spider is not an insect. Although spiders and insects are animals without backbones, they are very different. Spiders have eight legs. Insects have six legs. Most spiders have eight eyes and two body parts. The front of a spider is called the **cephalothorax**. This is the head and the thorax combined. The second part is the abdomen.
- ◆ Spiders inject poisonous venom which paralyzes or kills their prey. Because they have no teeth, a spider releases digestive juices into the victim, turning the insides of their prey into a liquid. Then, the spider is able to suck the victim just like you would suck liquid from a straw.
- ◆ All spiders have silk glands in their abdomens, but not all spiders are web builders. Spiders use the silk to protect their babies, to wrap up their victims, to make webs, and to form a **dragline** (or safety line) when they need to escape quickly.
- ◆ Web-spinning spiders rely on their crafty webs to catch their prey because they do not have good eyesight. Orb weavers make beautiful spirals in their webs. Tangled-web spiders make messy-looking webs. The purse-web spider makes a web that looks like a tube. The sheet-web spider makes its web close to the ground.
- ◆ Other spiders, such as the wolf spider and the jumping spider, have a keen sense of sight. The wolf spider chases its victims on the ground, while the jumping spider can actually jump up to eight inches to catch its prey.
- ◆ Spiders are helpful to mankind. They eat a variety of insect pests that normally damage crops and carry diseases. In fact, spiders eat more insects than any other animal.

# Millipedes And Centipedes

**Millipede** means “a thousand legs.”  
This creature’s quite a sight.  
One thousand legs it does not have,  
but hundreds would be right.

It feeds on plants or dead insects  
and slowly crawls around.  
You’ll find it lives in dark, damp places  
close to the ground.

Now, **centipede** means “a hundred legs.”  
This creature’s quite a sight.  
One hundred legs it does not have,  
but fifty would be right.

You’ll find it feeds mainly at night;  
by day it will withdraw.  
It feeds on insects that are alive  
and kills them with its claws.

**Many legs, many legs running all around.  
A millipede, a centipede, you’ll find them on the ground  
or under leaves or rotted wood where it is nice and dark.  
They even like to hide by rocks or by a piece of bark.**

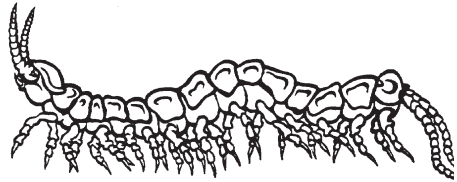
Now, millipedes and centipedes  
are good mothers to their young.  
They make a nest and lay  
their eggs and clean each little one.

They coil their bodies around  
the eggs until they finally hatch  
and help protect the newborns  
in its damp, dark habitat.

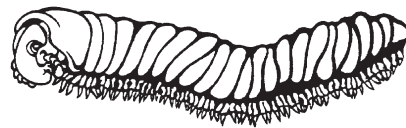
A millipede, when it is scared,  
will curl up in a coil,  
protecting all its inner parts  
as it lays in the soil.

Pick up a rock and look real close,  
these creatures you will see.  
For millipedes and centipedes  
will hide from you and me.

**(Chorus)**



**centipede**



**millipede**

# Ladybug, Ladybug

Oh, what do you eat, ladybug, ladybug?  
Oh, what do you eat when you're hungry?  
I eat aphids for a snack. They suck juice from the plants.  
And the farmers like that I protect their crops.



Oh, what do you do when you're scared, ladybug?  
Oh, what do you do when you're frightened?  
I turn over on my back, tuck my legs in and play dead,  
and most birds know that I'm not a tasty meal.

Oh, what do you do when it's time to lay your eggs?  
Oh, what do you do when it's time?  
I find a leaf or plant, lay my yellow eggs on them.  
They are sticky, so they don't fall to the ground.



Oh, what do you do when the wind starts to blow?  
Oh, what do you do when it's cold?  
I find other ladybugs and we find a hiding place  
and we hibernate throughout the long cold winter.



# True Bugs



**Bed bugs, stink bugs, chinch bugs, too,  
are true bugs belonging to a special group.  
Hemiptera is the scientific name,  
for not all insects are grouped the same.**

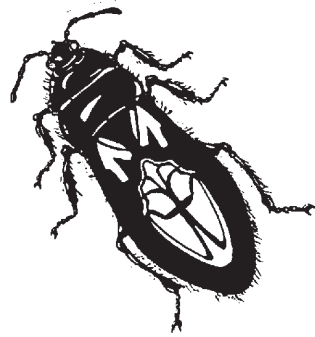
*Some people call all insects bugs, but they aren't all true bugs. True bugs are grouped in a special class called **hemiptera**, meaning "half-wing." The front wings of an insect in this class have a leathery base with a filmy outer edge. True bugs have sucking mouth parts and only go through three stages before developing into an adult.*

Bugs have a way of eating all their meals.  
They have a proboscis, which is really ideal.  
They pierce their prey and then they inject  
some poison that the victim doesn't expect.

They suck their meal in a peculiar way.  
It's a straw-like motion of sucking their prey.  
The liquid makes such a tasty snack  
that meal time becomes a special knack.

**(Chorus)**

Now all true bugs aren't predators, you see.  
For shield bugs they suck sap from leaves.  
Bugs have very distinctive wings.  
Yes, true bugs really are amazing things!



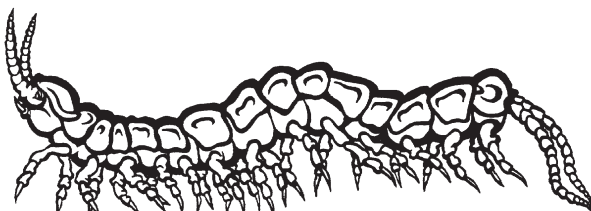
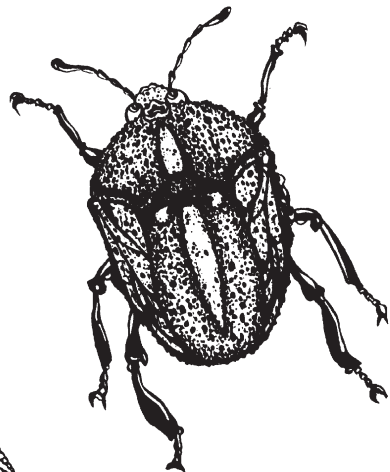
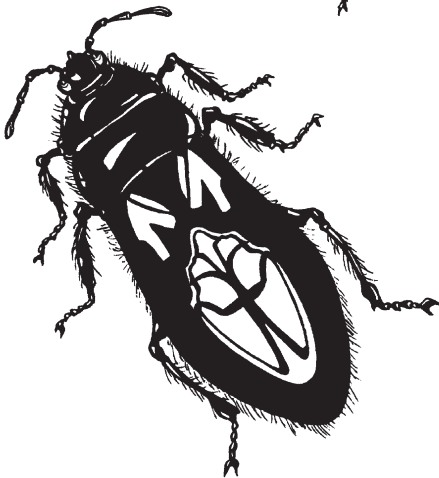
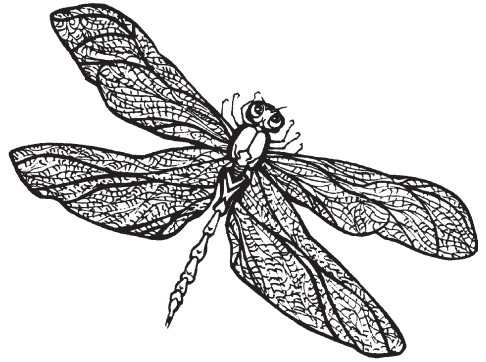
*They certainly are amazing. Did you know that the giant water bug can catch a small fish or frog with its hooked front legs, and water bugs can grow to be four inches long in South America?*

**(Chorus)**



# Circle The True Bugs

Not all insects are **true bugs**. The front wings on true bugs have a leathery base with a filmy outer edge. Circle the true bugs.



# You Can Be An Entomologist

Dear Friends:

My name is Dr. Randy Mitchell. I am an entomologist. I study insects to learn how they affect us and our world. I especially like to study how insects and plants affect each other. My favorite insects are bumblebees, but I think all insects are interesting.

I like to go to interesting places to study insects. I have been to California, Colorado, New Mexico, Ohio, and Australia to do this. Insects in different parts of the world are always new and exciting. I often bring my insect net when I travel, but it is more fun to follow just one insect at a time, to see what she is doing.

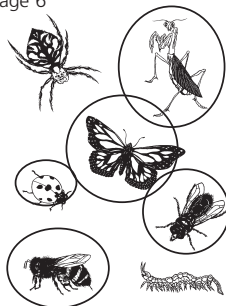
When I was a young boy I started raising honeybees and collecting insects in 4-H. To learn more about insects, I went to college to learn from the experts. I eventually learned so much that I became an expert myself. It took a long time, but it was fun because I was doing things I really like.

As an entomologist I have done many different things. I have helped test ways to control pests that eat our food, and ways to improve pollination of crops. I have studied insect behavior, why insects live where they do, and how they pollinate plants. I also teach university biology. I love to do all these things, and am glad I am an entomologist!

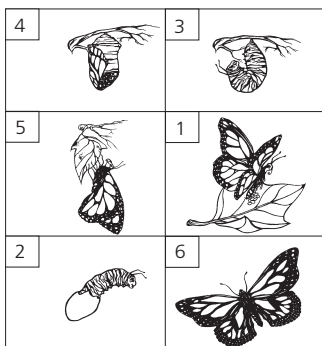
Sincerely,  
Dr. Randy Mitchell

## Answer Key

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