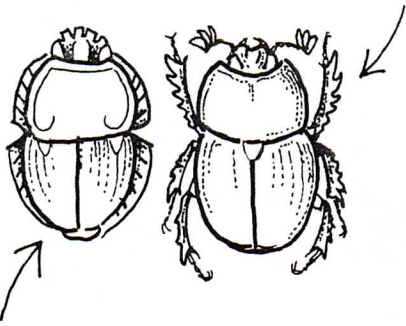


Order: **Coleoptera** (the Beetles!)  
 Ko-lee-OP-ter-ah)

Scarab Beetle



3,000 year-old scarab-shaped amulet (a charm) from ancient Egypt. It's carved from stone: blue Lapis Lazuli. Pharaoh Tutankhamen had a big stone scarab as a bracelet!

Antennae (2)

Head

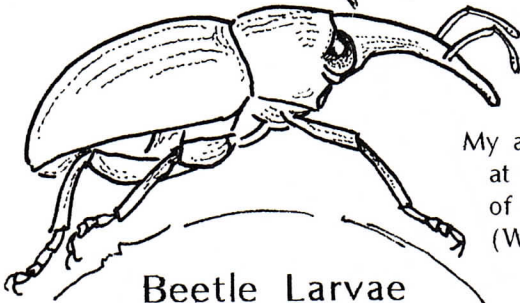
(Um, what else could it be??)

Thorax



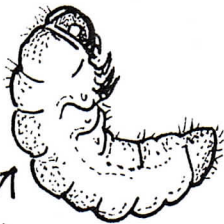
Lady-Birds are beetles, too.

I'm a weevil!



My antennae grow at the end of my snout. (Weird, huh?)

Beetle Larvae (LAR-vee) are sometimes called **Grubs**



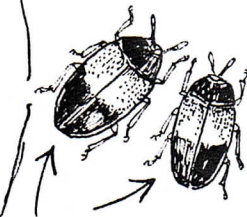
Color: brown

pale yellow

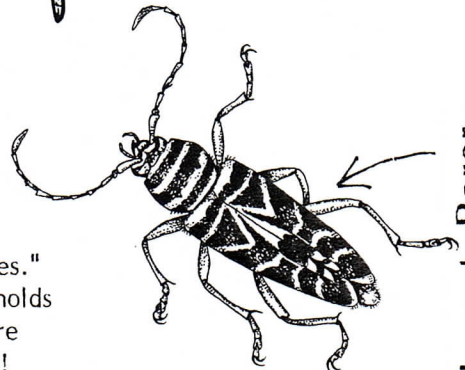
Some larvae live in rotten wood, others live in soil. Some scarab larvae develop in blobs of animal dung (Eeww!)

Elytra (2)

These are the hard, outer wings. They cover another set of wings underneath



These dermestid beetles are sometimes called "rug bugs" or "larder beetles." They are common in households nearly worldwide -- they're probably in your house, too!



Locust Borer

# Order: Coleoptera (Beetles)



## WORD-FINDER

Look for these words:

- Beetle
- Coleoptera
- Elytra (there's 2)
- Scarab (there's 2)
- Weevil
- Antennae (2)
- Species



A	N	T	E	N	N	A	E	O	B
S	E	E	W	O	S	Y	S	E	E
C	L	E	E	V	I	L	C	L	E
A	Y	R	E	N	E	E	A	Y	T
R	T	E	V	I	L	L	R	T	L
A	R	L	I	L	Y	T	R	R	E
B	A	A	L	S	C	A	R	A	B
S	P	E	C	I	E	S	A	L	O
C	O	L	E	O	P	T	E	R	A
N	A	N	T	E	N	N	A	E	O

## WORD SCRAMBLE:

Some beetles have very long

N E E T A N A N

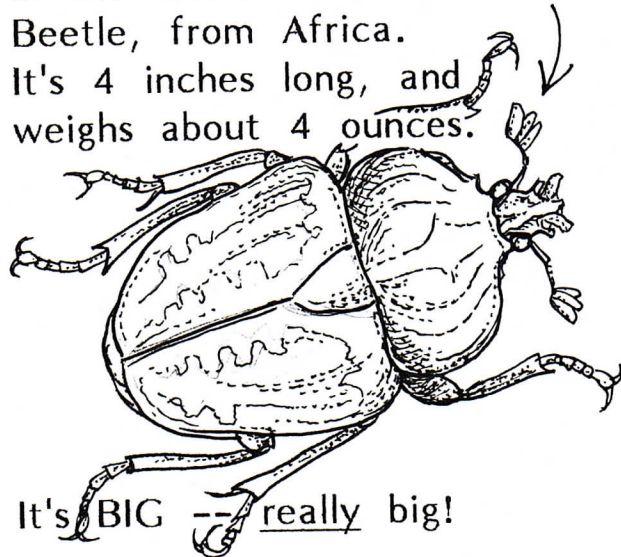
King Tutankhamen wore a bracelet with this beetle design:

C R A A B S

## Did You Know??

One of the largest beetles in the world is the Goliath Beetle, from Africa.

It's 4 inches long, and weighs about 4 ounces.



It's **BIG** -- really big!



## Beetle Facts:

There are over 300,000 species of beetles around the world.

20,000 are scarabs.

About 90 species (types) of scarabs live in the U.K., and over 1,000 in the U.S.

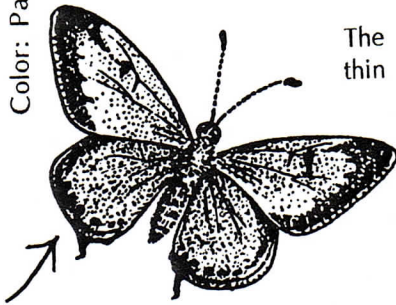


# Order: Lepidoptera (Butterflies & Moths)

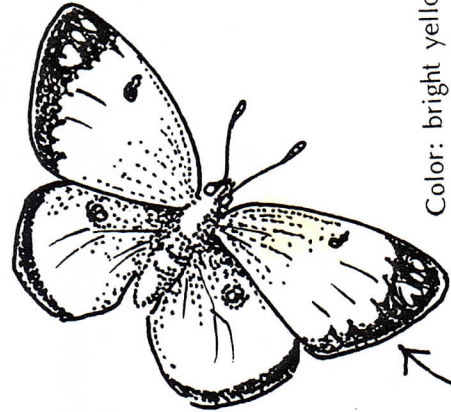
(lep-ih-DOP-ter-ah)

Eastern Tailed Blue Butterfly

Color: Pale blue.



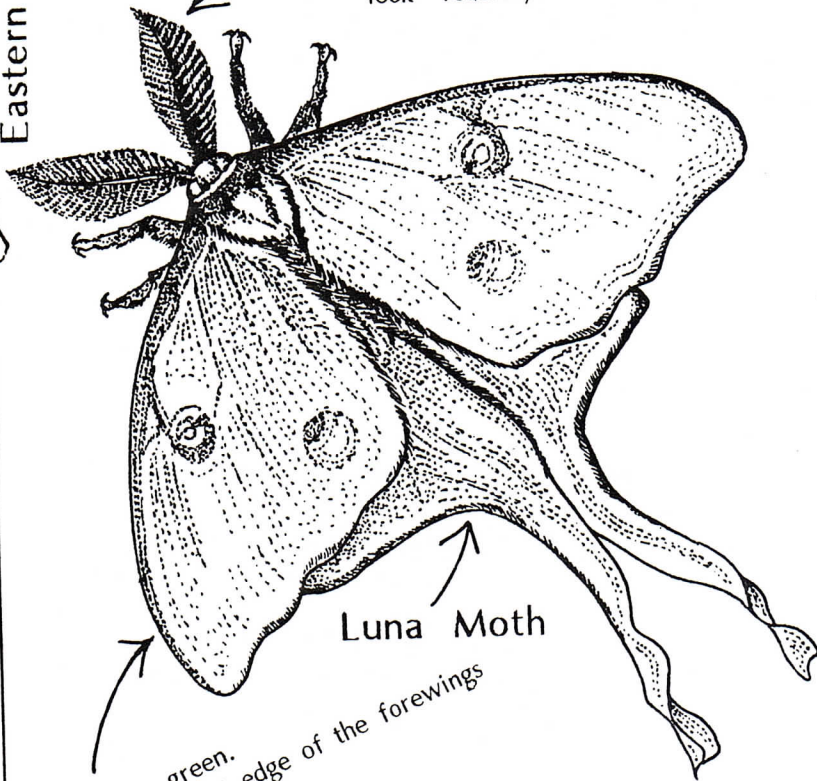
The antennae of most butterflies are thin and thread-like.



Color: bright yellow.  
Common Sulphur Butterfly

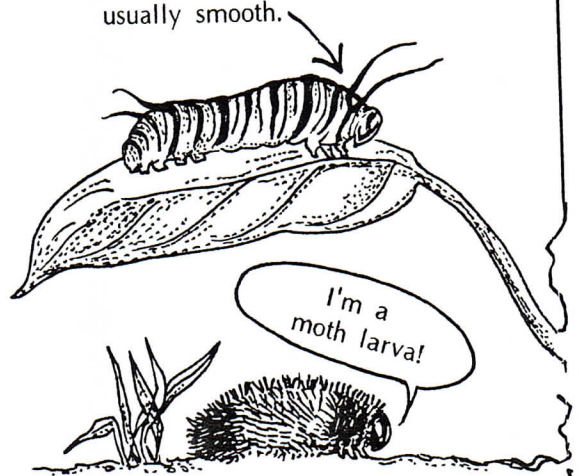
The antennae of most moths look "feathery" or "ferry."

Butterfly larvae (caterpillars) are usually smooth.



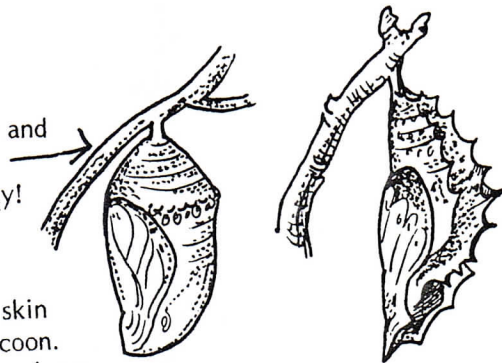
Luna Moth

Color: Pale green.  
The front edge of the forewings is purple.

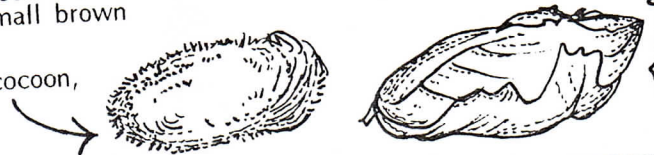


The larvae (caterpillars) of some moths are very fuzzy.

The larva of a butterfly sheds its skin and develops into a pupa (a chrysalis). The chrysalis can be smooth, or spiky!



A moth larva (caterpillar) sheds its skin and develops into a pupa inside a cocoon. The cocoon can be a neat fuzzy egg-shape or wrapped up in a leaf, like a small brown package. The larvae uses silk to make the cocoon, or to hold it together tightly. (Silk is very strong!)



Order: Lepidoptera (Butterflies & Moths)



### Word-Finder

Look for these words:

- Butterfly (there's 2)
- Moth (there's 3)
- Caterpillar
- Luna
- Cocoon (2)
- Chrysalis
- Larva (3)
- Antennae
- Pupa

A	B	U	T	T	E	R	F	L	Y	L
O	C	O	C	O	N	N	A	C	A	
L	A	R	V	A	L	A	R	V	A	R
C	A	T	E	R	P	I	L	L	A	R
M	O	T	H	L	A	R	V	A	A	R
A	N	T	E	N	N	A	E	N	E	A
C	R	C	H	R	Y	S	A	L	I	S
L	U	N	A	L	A	M	O	T	H	Y
M	O	T	H	R	A	A	P	U	P	A
C	O	C	O	C	O	C	O	N	O	
U	B	B	U	T	T	E	R	F	L	Y

### Word Scramble:

The caterpillar (larva) of a butterfly sheds its skin, and develops into a

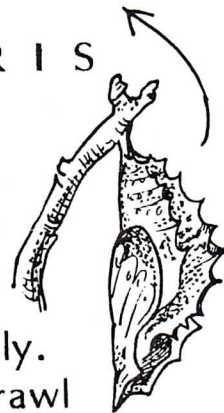


A moth larva sheds its skin, and develops into a pupa, inside a silk

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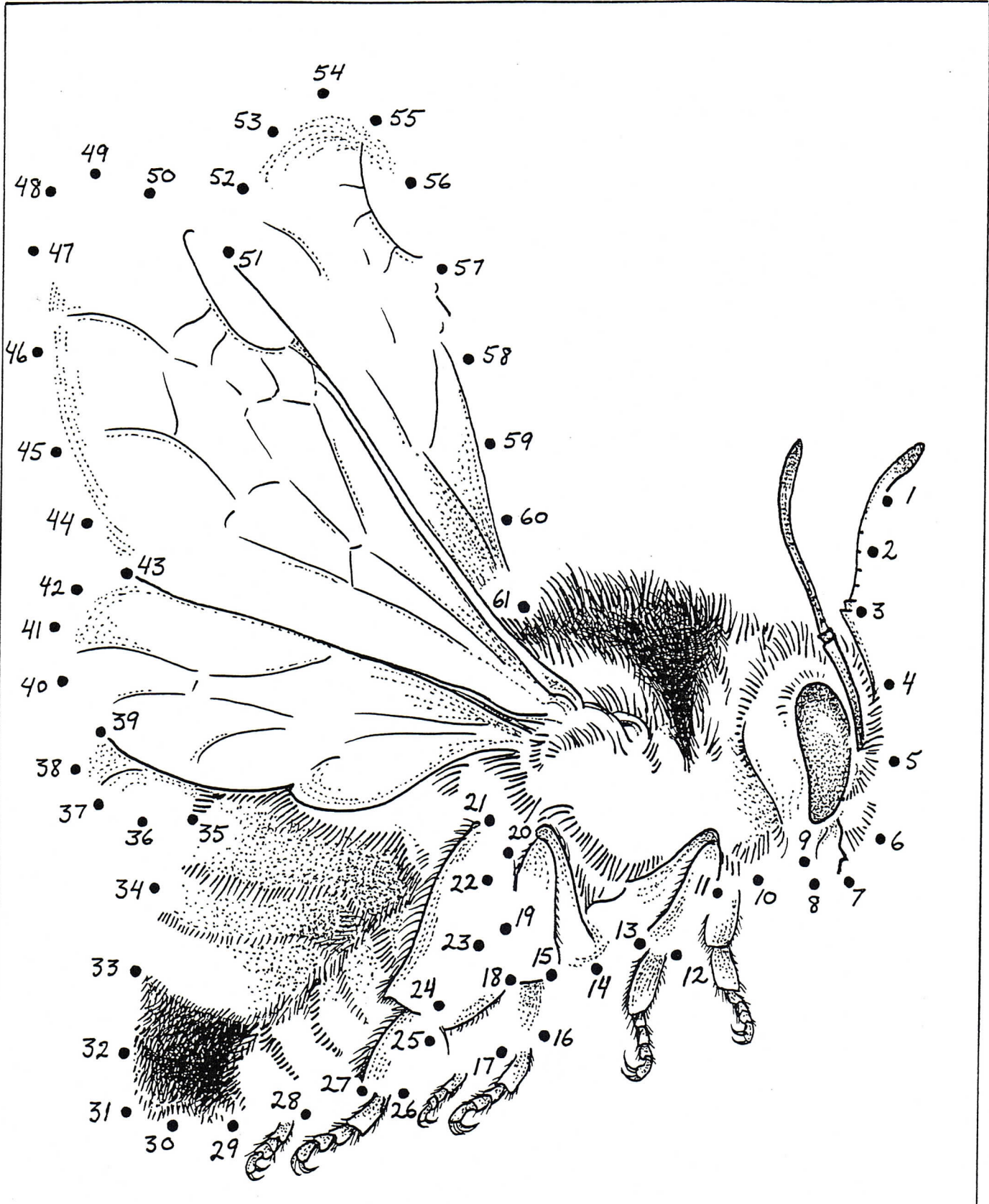
S A L Y C H R I S

\_\_\_\_\_  
c o o o n c

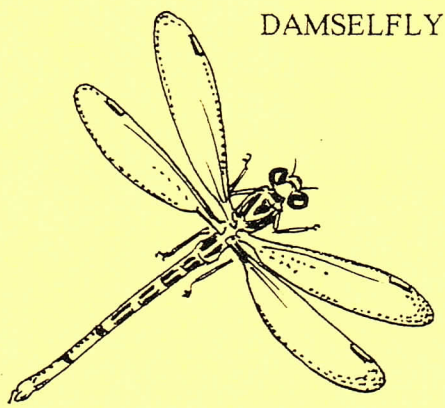


### Lepidoptera Facts:

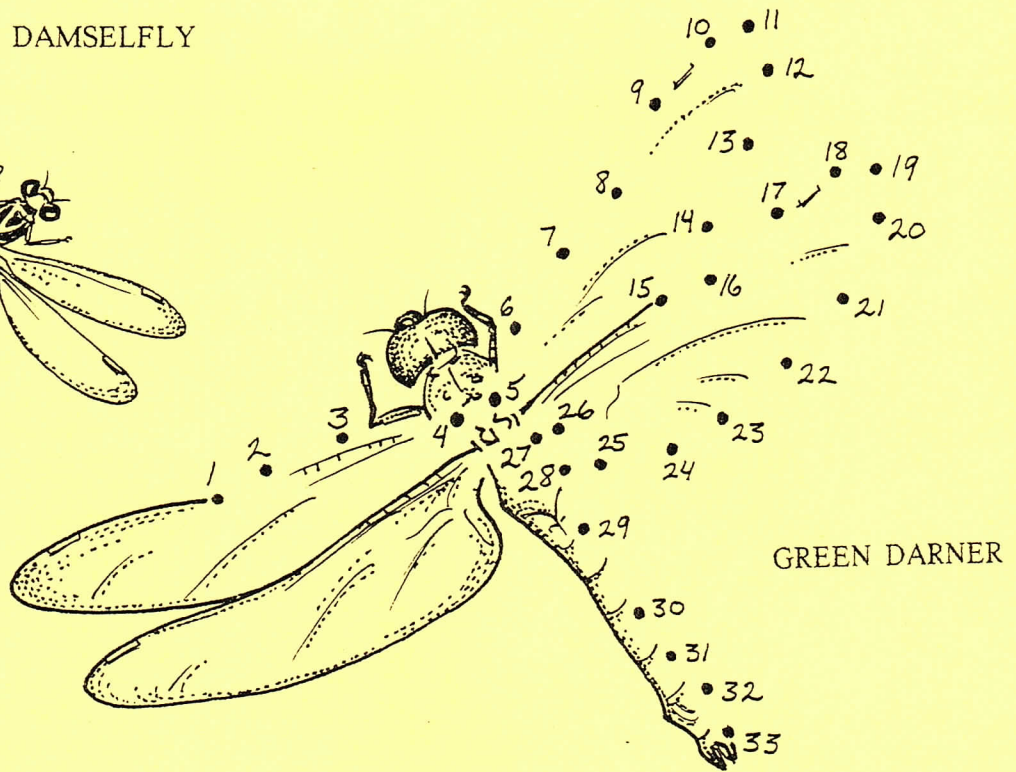
Not all Butterflies and Moths can fly. The females of some species just crawl around on the ground, even though they have wings! There are about 170,000 species (types) of Lepidoptera world-wide. Most are moths.



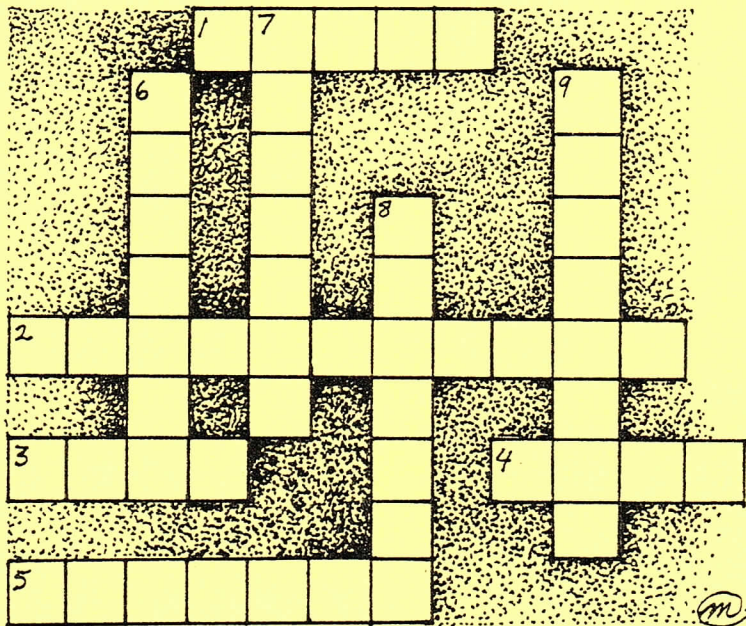
Red-Tailed Bumble Bee  
*(Bombus ternarius)*



DAMSELFLY



GREEN DARNER

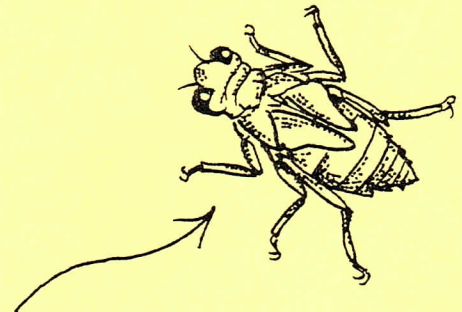


Choose from these words to find the answers:

- AQUATIC
- DIPTERA
- FOUR
- MOLT
- TERRITORIAL
- NAIAD
- ODONATA
- PREDATOR
- TENERAL

### DRAGONFLY CROSSWORD

- ACROSS:
1. The aquatic young form of a Dragonfly, shown here
  2. This describes the male Dragonfly, when he defends his home area.
  3. To shed the skin.
  4. How many wings does a Dragonfly have?
  5. The Order of flies, gnats and mosquitos. (It does NOT include Dragonflies.)
- DOWN:
6. A newly emerged Dragonfly.
  7. Living in the water.
  8. The Order of Dragonflies and Damselflies.
  9. An animal that hunts and kills its own food.



## SACRED SCARAB

SCIENTIFIC NAME: Scárabéus sácer

ORDER: Coleóptera (Beetles)

SIZE: About 1 inch long.

WHAT IT EATS: The dung (feces) of cattle, sheep or camels.

WHERE IT LIVES: North Africa; Mediterranean area.

COLOR: Black.

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LIFE CYCLE: Egg. Underground Larva ("grub") and Pupa. Adult

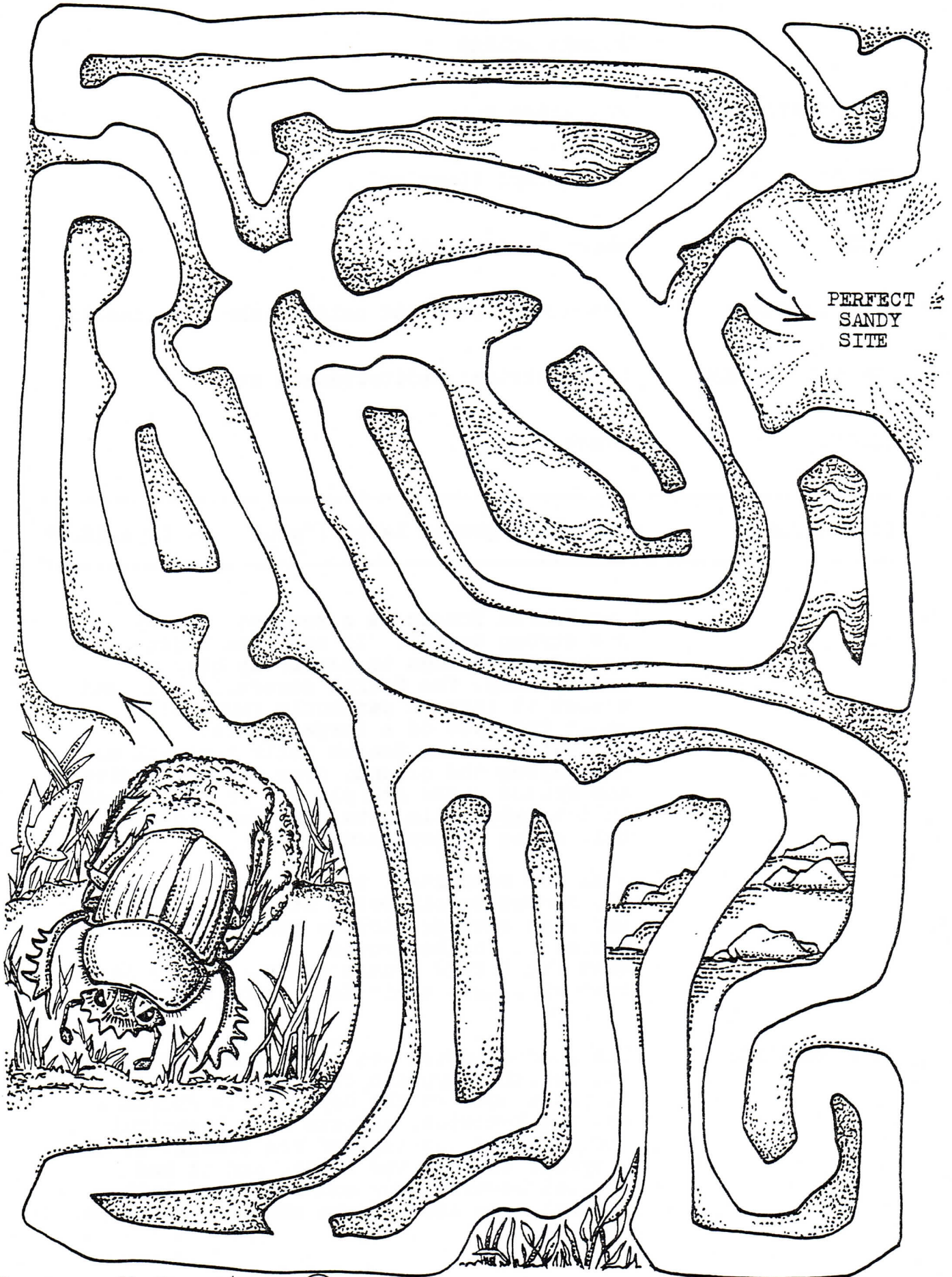
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The Sacred Scarab is a rounded, stocky and strong beetle. It uses its short spiked front legs to gather up bits of animal dung. The Scarab carefully pats and pushes it into an perfectly round ball about the size of a large marble. The hard-working Scarab rolls the ball of dung along the ground, over mounds of dirt and around rocks and plants. It even stands on its head, using its hind legs to push the ball along -- backwards!

When the compacted, round ball is complete, the Sacred Scarab rolls it to a safe place, and lays her eggs inside the ball. Then she buries it in the ground. When the little Scarab grubs (larvae) hatch, they will have their food right there!

IT'S AMAZING: The Sacred Scarab was a familiar beetle to the ancient Egyptian culture, thousands of years ago. In the days of the Pharoahs and the Pyramids, artists made beautiful pictures and carvings of the Scarab. It was a symbol of life and death, and it had magical powers. Many amulets (good luck charms) were made in the shape of a Scarab.

FIND THE PERFECT NEST SITE!





# PAPERWASPS IN MAINE

Paperwasps belong to the Family Vespidae. They build multi-celled nests from chewed-up plant fibers taken from lumber, posts or bark, and their open-comb nests hang downward like tiny lampshades. Close relatives include Hornets and Yellowjackets in the Subfamily Vespinae; some of these species make paper nests underground, while others construct arboreal nests which have the comb protected by an outer "bag."

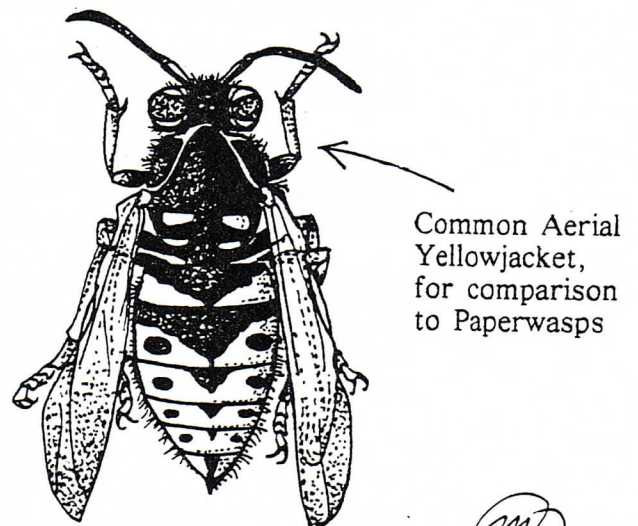
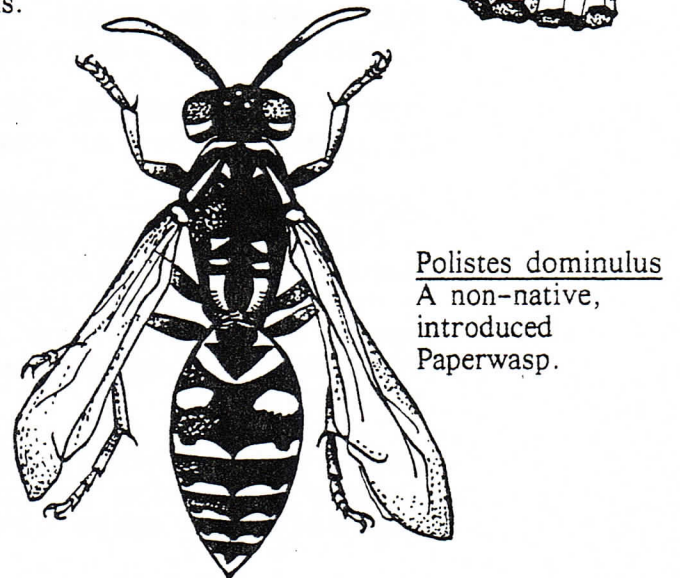
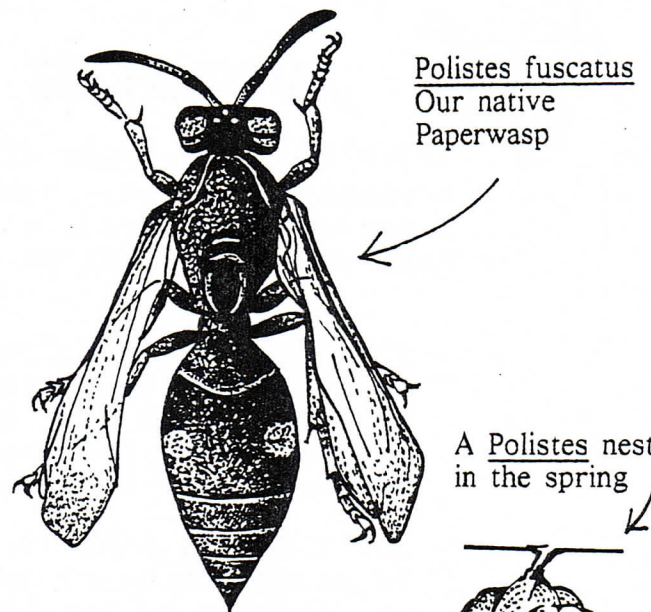
Maine has 2 species of Paperwasps. The brownish black or dark chestnut-brown Polistes fuscatus is our only native Paperwasp. Females overwinter in attics, garages & houses. An overwintering female, or "foundress," will start a small nest in the spring, & will be helped later by other females. Nests can be found in overturned flowerpots, under eaves and in barns. Females hunt for small caterpillars and other insects to chew up (malaxate) into nutritious globs for the developing wasp larvae.

The colors of our native Paperwasp are dark brown or chestnut, with indistinct or pale yellowish lines. There may be maroon or barn-red marks alongside the eyes and sometimes two vague maroon spots on the abdomen. There is much variation in color. Females may have a considerable amount of maroon on the face. Males have yellow faces, with much yellow on their undersides.

A newcomer to Maine is the much more brightly colored Paperwasp Polistes dominulus, a native of Europe, Asia & the mid-East. It was first caught in Maine by the author in York County in 1995, and reported in the 6/1996 issue of SPHECOS. It has been caught each year through 1998, with specimens found in Biddeford, Arundel and Sanford.

This non-native insect has been recorded in Ohio, NY, CT, NJ, MD and PA since the early 1990s and is obviously spreading. Whether it will affect the breeding success of our native Paperwasp is not known; one always considers the "English Sparrow problem," or Starlings, when thinking of introduced species!

One of our common Yellowjackets, Vespula (Dolichovespula) arenaria is shown here for comparison with the Paperwasps.



(M.J.)



## AVOIDING INSECT STINGS

There are many types of stinging insects in Maine: hornets, honeybees, bumblebees, yellowjackets, and paper-wasps, to name a few.

Here are a few tips to avoid getting stung:



- DON'T WEAR BRIGHT COLORS OUTDOORS.  
Experts warn that bright yellow and bright blue seem to attract and even agitate some species. Solid black also seems to be a bad choice. Wear "earth tones" instead: khaki, olive, terra cotta, or clay, for example.
- DON'T SWAT & SLAP AT BEES OR WASPS!  
It sounds obvious, but people do it. It only forces the insects to perform to defend themselves.
- DON'T WALK BAREFOOT -- OR IN SANDALS.  
Especially on lawns with clover, where honeybees forage.
- DON'T WEAR PERFUME, SCENTED LOTION, OR HAIRSPRAY OUTDOORS.  
It may attract, or upset wasps.
- NEVER -- EVER -- DRINK SODA OR JUICE FROM A CAN LEFT ON A TABLE OUTDOORS! THIS IS DANGEROUS!  
Bees and wasps crawl right inside the open can to get a drink. When you lift the can to your mouth, you'll upset the insect, and get stung.  
POUR OUT the drink into a clear glass, so you can see the contents.
- DON'T DELIBERATELY DISTURB A NEST.  
It may look like no one's home at the moment, but there may still be wasps inside.
- STAY AWAY FROM PICNIC AREAS WHERE GARBAGE CANS ARE FILLED WITH DISCARDED FOOD & DRINK.
- STAY CLEAR OF FRUIT TREES OR SHRUBS WHERE RIPE OR ROTTING FRUIT HAVE FALLEN ON THE GROUND.
- DON'T USE HEDGE CLIPPERS OR PRUNING SHEARS ON SHRUBS OR EVERGREENS, UNTIL YOU CHECK TO BE SURE THERE ARE NO NESTS ATTACHED TO THE TWIGS.
- DO NOT USE WOODEN OUTDOOR FURNITURE (PICNIC TABLES OR ADIRONDACK CHAIRS) IF THEY'VE BEEN UNUSED ALL SPRING.  
Since these items have been left untouched all spring, Wasps may have already built nests under the seats.

# AN ORDER OF FLIES, PLEASE

All insects belong to the Class Insecta. (Spiders, ticks, and mites belong to the Class Arachnida.) This book is about insects only.

The Class of Insects includes many different Orders. You can probably already identify insects from a few large Orders: beetles belong to the Order Coleoptera, and houseflies are members of the Order Diptera.

Here are some of the larger Orders of Insects:



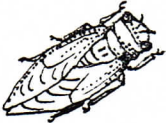
ODONATA Dragonflies and damselflies



ORTHOPTERA Grasshoppers and crickets



HEMIPTERA Water boatmen, ambush bugs, stinkbugs



HOMOPTERA\* Cicadas, aphids and treehoppers



DIPTERA Flies, mosquitos, gnats



COLEOPTERA Beetles



LEPIDOPTERA Butterflies and moths



HYMENOPTERA Ants, wasps and bees



ISOPTERA Termites



SIPHONAPTERA Fleas



NEUROPTERA Lacewings, antlions and dobsonflies

MO 65

Each Order can include many different Families!

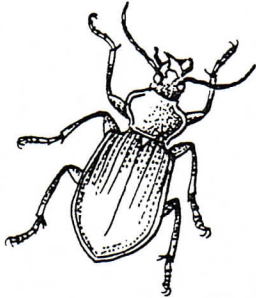
\*Homoptera is now a suborder, or part, of Hemiptera!

Did you know scientists called Taxonomists group organisms into categories, and sometimes the categories change?

# INSECT ORDERS WORD GAME



FIND THE INSECT ORDERS IN THE GAME-BOX,  
AND DRAW A CIRCLE AROUND EACH WORD.  
SOME WORDS GO ACROSS, AND OTHERS READ DOWNWARDS.



ISOPTERA  
HOMOPTERA  
ODONATA  
HYMENOPTERA  
COLEOPTERA

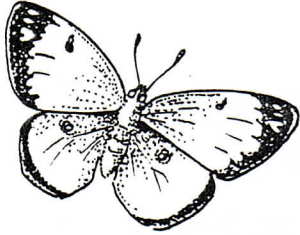
HEMIPTERA  
NEUROPTERA  
ORTHOPTERA  
LEPIDOPTERA  
SIPHONAPTERA

DIPTERA

A P T E R Y X A L M Y H C  
S O L I L O Q U Y U H O C O  
I S O P T E R A P T E M L E  
P O R T M O R E S B Y O E  
H O H E M I P T E R A P P O  
O R T H O P T E R A D T P  
N E U O D I P T E R A E T  
A R O P R A C I N O M R E  
P H Y M E N O P T E R A R  
T H E A X O L O T L O A A  
E L E P I D O P T E R A T  
R N E U R O P T E R A R A  
A L L O D O N A T A R U S

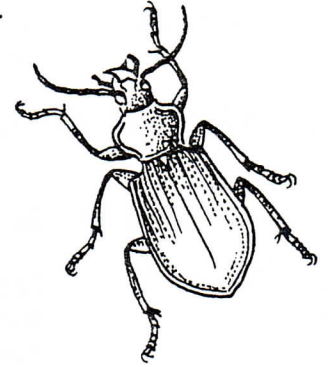
# WORD FINDER GAME-BOX

THE WORDS LISTED BELOW ARE "LOST" INSIDE THE GAME-BOX.  
FIND EACH WORD, AND DRAW A CIRCLE AROUND IT.  
(SOME WORDS GO ACROSS, & SOME READ DOWNWARDS).



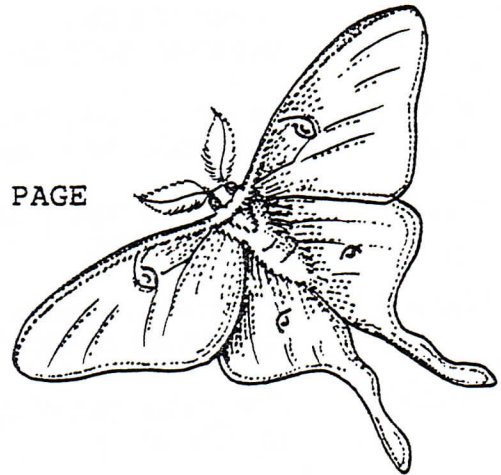
AMBER  
ANTENNAE  
BEETLE  
CAMOUFLAGE  
CHRYSLIS  
COCOON  
DIPTERA  
ENTOMOLOGY  
LARVA

MANDIBLE  
MOTH  
NYMPH  
OCELLI  
POLLINATE  
SPECIES  
SPIDER  
STRIDULATE  
THORAX



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

DEFINITIONS ARE ON THE NEXT PAGE



## DEFINITIONS

- AMBER:** Fossilized tree resin, millions of years old. Insects may be preserved inside.
- ANTENNAE:** The two "feelers" on the head of most adult insects. The antennae help give the insect a sense of touch and smell.
- BEETLE:** A member of the order Coleoptera (kole-ee-OP-terrah). Scarabs, chafers, ladybeetles and weevils are all beetles.
- CAMOUFLAGE:** Colors or patterns that help an insect hide. Many insects that feed on leaves are bright green. Moths wings often look like tree bark.
- CHRYsalis:** Resting stage between caterpillar and butterfly.
- COCOON:** Protective silk case, made by an insect larva, so it can pupate safely inside. Moths emerge from cocoons which often appear soft or fuzzy. Spiders (which are not insects) spin cocoons to protect their eggs.
- DIPTERA:** (DIP-ter-ra) The order of flies, gnats and mosquitoes. All members of the order Diptera have only one pair of wings.
- ENTOMOLOGY:** (ento-MOL-oh-jee) The study of insects. A scientist who specializes in learning about insects is an Entomologist.
- LARVA:** A young or immature insect. A caterpillar is the larva of a butterfly. A maggot is the larva of a housefly. Grubs are the larvae of beetles.
- MANDIBLE:** The jaws of an insect.
- MOTH:** A close relative of butterflies. Moths usually look fatter and fuzzier than butterflies, and have feathery antennae. Most are active at night. The larva usually spins a Cocoon instead of making a Chrysalis.
- NYMPH:** The immature form or larva of a dragonfly. Dragonfly nymphs live in streams and ponds. The larvae of Mayflies, Stinkbugs and Cicadas are called nymphs, too.
- OCELLI:** (oh-SELL-ee) As many as three small "simple eyes" on the head of many insects. They can only show light and darkness, not shapes.
- POLLINATE:** To carry pollen from one flower to another, or to move pollen to the center of a flower, so that fruits and seeds develop. Bees, wasps and butterflies pollinate most of our garden fruits and vegetables.
- SPIDER:** Spiders are not insects! They are members of a different class, called Arachnida. Adult insects have 6 legs. Spiders have 8.
- SPECIES:** One single type of animal or plant. There are many different species of dragonflies. There are thousands of species of beetles in the U.S.
- STRIDULATE** The creaky, squeaky noise that many beetles make. Crickets stridulate too: they scrape or rub their wings together to make chirpy squeaky sounds.
- THORAX:** The middle part of an adult insect's body. The legs are attached to the Thorax.