An Introduction To Insects

established for Elementary School Teachers

by

the creators of Build-A-Bug '96
The following excerpts (pp. 1-18) were taken from the 4-H Entomology Member's Guide (1995). This guide was created by Tracy Newton, who is involved with Agricultural and Extension Education at The Pennsylvania State University.

All the creatures of the world are divided into 5 groups called kingdoms:

ANIMALS          PLANTS          FUNGI          BACTERIA         PROTOZOA

Insects are in the animal kingdom.
The animal kingdom is then divided into vertebrates (animals with a backbone) and invertebrates (animals without a backbone).
Insects are invertebrates.
Invertebrates are divided into phyla (fi'-luh).
Insects are in the phyla Arthropoda meaning "jointed legs".
There are several different groups or classes of Arthropods.
Insects are in the class Insecta.
Arthropod classes include:

Arachnida (A rack nid' a) (spiders and their relatives)
**Diplopoda** (Dip lo pode'a) (millipedes)

**Chilopoda** (Chill a pode'a) (centipedes)

**Crustacea** (Crust a she a) (crabs, shrimp, crayfish, and their relatives)

**Insecta** (In seck ta) (insects)

- grasshopper
- ant
- bug
- fly
- earwig
- butterfly
- aphid
- beetle
What Are Insects Made Of?

All insects have several characteristics in common. They all have:

1. A skeleton (hard covering) on the outside of the body called an **exoskeleton**. This gives an insect protection. The exoskeleton of an insect is made up of chitin which is the same material that is found in your fingernail!

2. Three body regions. The head holds the eyes, mouthparts and antennae. The thorax is the middle part where the legs and wings are attached. The abdomen is the part behind the thorax and contains the organs of digestion and reproduction.

3. Six legs (three pairs). Each pair is connected to a segment of the thorax.

4. Two antennae. The **antennae** are on the front of the head. They serve as organs of touch and sometimes taste, smell, and hearing. They are often called "feelers".
Testing Your Memory

Try to answer the following questions without looking back at the material you just read.

1. Can you remember the 5 kingdoms of creatures?

_________________________________________________________________
_________________________________________________________________
_________________________________________________________________
and __________________________________________________________________

2. What kingdom are insects in?

_________________________________________________________________

3. What are animals with backbones called?

_________________________________________________________________

4. What are animals without backbones called?

_________________________________________________________________

5. Insects are:
circle one: vertebrates invertebrates

6. List the creatures in each class of arthropods.
Arachnida ________________.
_________________________________________________________________
_________________________________________________________________

Chilopoda ___________________

Diplopoda ___________________

Crustacea ___________________

_________________________________________________________________

7. Can you name three of the four characteristics that all insects have in common?

1. ______________________

2. ______________________

3. ______________________

8. What is an exoskeleton?

_________________________________________________________________

9. What is chitin?

_________________________________________________________________

10. What are antennae?

_________________________________________________________________

11. What is a thorax?

_________________________________________________________________

12. Can you label the parts of this insect? Use the terms: head, thorax, abdomen, antennae, front wing, hind wing, legs.

[Diagram of an insect]
Flying, Eating, And Changing Form

* The following lesson and exercise will help you learn about the characteristics of insects that help us to group them into orders. *

**WINGS**
Insects may have no wings, one pair or two pairs of wings. Their wings may be covered in **scales** (powdery parts of the wings of butterflies and moths).

Or they may have clear wings with veins showing through called **membranous** wings as in a wasp.

Or the outer wings may be hard and shell-like as in a beetle.

**MOUTHPARTS**
The mouthparts of an insect vary also. They may be either chewing, piercing-sucking, **siphoning** (tube-like mouthparts that take up food source like a soda straw), sponging, or they may not have any mouthparts at all!

Mayflies spend all but one day of their lives in the water. They emerge as adults, fly out of the water, mate, lay eggs, and die all in the same day. Therefore, they have no mouthparts as adults because they do not live long enough to eat.
Metamorphosis
Each insect also grows up and changes shape, a process called metamorphosis. There are three different types of metamorphosis.

Simple Metamorphosis
(silverfish, springtails, lice)
Insects in this category emerge from an egg looking exactly like a small form of the adult insect. It goes through several stages of shedding its skin called molting to grow larger until it is the full size of the adult.

Incomplete Metamorphosis
(Grasshoppers, termites, true bugs, aphids, leafhoppers, earwigs, mayflies, dragonflies, stoneflies)
Insects in this category hatch from an egg and become a nymph (stage of an insect that doesn’t have wings). The nymphs go through changes in their body as they molt their skin. One important change is that they develop wings. Once they molt and develop a full set of wings, they become adults. In some aquatic insects, the nymphaal stage is called a naiad.

Complete Metamorphosis
(butterflies, moths, flies, bees, wasps, beetles, lacewings, scorpionflies, cadisflies, fleas)
These insects have four different stages of growth. They hatch from eggs and turn into a larvae. The larvae look like worms or caterpillars. Sometimes they have legs and sometimes they do not. Once the larvae have eaten enough food, they change into a pupae. A pupa is the quiet stage that doesn’t move. Sometimes pupae have cocoons around themselves for protection. Cocoons can be spun from silk or can be a combination of leaves or debris. The pupa gradually changes form into the adult. The adult will break through the old skin of the pupa and the cocoon, if there is one, and begin its life as an adult.
Wings, Mouthparts and Metamorphosis Review

Try to fill in the blanks without looking back at what you just read.

1. Can you describe 3 different kinds of insect wings?


and sheds its skin many times. It develops wings and becomes an adult.

What type of metamorphosis is this?
SIMPLE INCOMPLETE COMPLETE

2. Can you name the different kinds of mouthparts insects have?


B. The insect starts as an egg. It hatches into a larva. The larva eats a lot of food and changes into a pupa. The pupa remains quiet until the adult emerges.

What type of metamorphosis is this?
SIMPLE INCOMPLETE COMPLETE

3. After reading the sentences describing a type of metamorphosis, circle the correct answer.

A. The insect starts as an egg. A nymph or naiad hatches from the egg


C. This insect starts as an egg. It looks just like the adult only smaller. It sheds its skin a few times and each time gets bigger, but never changes its form.

What type of metamorphosis is this?
SIMPLE INCOMPLETE COMPLETE

4. Match the following terms on the left to the correct definitions on the right by filling in the letter of each definition in the blank next to the terms.

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>membranous</td>
<td>A. Clear wings with veins showing through</td>
</tr>
<tr>
<td>nymph</td>
<td>B. Worm-like or caterpillar stage of insect after hatching from egg</td>
</tr>
<tr>
<td>molting</td>
<td>C. A term for the aquatic nymphal stage of an insect</td>
</tr>
<tr>
<td>naiad</td>
<td>D. The process of changing form in the insect from egg to adult</td>
</tr>
<tr>
<td>pupa</td>
<td>E. Tube-like mouthparts that take up food as in butterflies and moths</td>
</tr>
<tr>
<td>metamorphosis</td>
<td>F. The quiet stage of an insect before it becomes an adult</td>
</tr>
<tr>
<td>siphoning</td>
<td>G. The process of shedding its skin to grow bigger</td>
</tr>
<tr>
<td>larva</td>
<td>H. The term for an insect stage without wings that hatched from an egg</td>
</tr>
</tbody>
</table>
Learning the Insect Orders

* Let's look at the some common orders of insects, the types of insects that fit into these orders, and some common characteristics of each order.*

**BLATTARIA** (Blat tair' ee uh)
These insects are the cockroaches. They have **two pairs of wings**. They are general feeders with **chewing mouthparts** and eat garbage and waste material, giving them the reputation of being dirty insects. They are mainly nocturnal insects and are hard to catch because they move very fast. They can be found in a house, in leaf litter or under bark. They undergo **incomplete metamorphosis**.

**COLEOPTERA** (Coal lee op' ter uh)
The order Coleoptera include the beetles. This order is the largest of all the orders of insects. Beetles range in size from less than a millimeter to four and a half inches! You can find different types of beetles almost everywhere and they eat almost anything. Beetles have **chewing mouthparts**. They have **two pairs of wings**. "Coleo-" means "sheath" and "-ptera" means "wings" referring to the fact that beetles have an armored outer wing. The outer wings are hard or shell-like and the inner wings are membranous. They undergo **complete metamorphosis**.
DIPTERA (Dip’ ter uh)
These insects are flies and mosquitoes. They only have one pair of wings, hence the name Diptera. “Di-” means “two,” and as you already learned, “-ptera” means “wings.” Flies are also a very large order of insects. Some flies have sponge-like mouthparts that help them lap up their food. They feed on plant or animal juices, nectar, sap, blood, or other insects. They can be found around decaying matter, food or garbage. They secrete enzymes on the food to make it easier to take up. Other flies have piercing-sucking mouthparts and are able to “bite”. Mosquitoes have piercing-sucking mouthparts and are located near water sources, since they live in water as larvae. Dipterans have complete metamorphosis.

HYMENOPTERA
(High men op’ ter uh)
The order Hymenoptera includes bees, wasps and ants. These insects are called Hymenopterans because “Hymen” was the god of marriage. This marriage refers to union of the front wings and the hind wings by a row of tiny hooks. Some have two pairs of wings. Some ants are wingless. The front wings are larger than the hind wings. Hymenopterans are found almost everywhere. Most of them have chewing mouthparts, but some bees have lapping mouthparts that are formed into a tongue-like structure that helps in taking up liquids. They undergo complete metamorphosis.
MANTODEA (Man toe' dee uh)
The insects in the order Mantodea are the praying mantids. There is no law against collecting mantids as some people believe. They are slow moving and fairly easy to collect. They feed on a variety of insects—even each other. Mantodea means "soothsayer" because of the way they hold their front legs in a praying position. They have chewing mouthparts and two sets of wings. They also undergo incomplete metamorphosis.

LEPIDOPTERA (Lep i dop' ter uh)
The order Lepidoptera includes butterflies and moths. "Lepido-" means "scale" so Lepidoptera means "scale wings." These colored scales on their wings rub off easily when handled, so try not to touch the wings when you collect them. There are 11,000 different kinds in the United States and Canada. They are found almost anywhere and mostly feed on nectar of flowers. They have a siphoning mouthpart called a proboscis that is like a straw to help them suck up nectar. Like beetles, they too undergo complete metamorphosis.

odonata (O da na' tuh)
The insects in the order Odonata are the dragonflies and the damselflies. The name Odonata means tooth and refers to the teeth on their mouthparts. They have chewing mouthparts and feed on insects or other small creatures. They are usually found near the water. They have two pairs of wings that are long and membranous. They undergo incomplete metamorphosis.
HEMIPTERA (Hem ip' ter uh)
Insects in the order Hemiptera are the true bugs. "Hemi-" means "half" and refers to the fact that the wings of bugs are half thickened and half clear. The wings are folded in an X-shape on their back when at rest. They have two pairs of wings. They have a beak that houses their mouthparts which are piercing-sucking. This beak comes from the front part of the head. They are found on land or in water and feed on plant juices, insects, or blood. They undergo incomplete metamorphosis.

HOMOPTERA (Hom op' ter uh)
Insects in this order include: the cicadas, hoppers, aphids, whiteflies and scale insects. The last three listed have soft bodies and are small so they won't make good insects for your collection. "Homo-" means "same" and this refers to the fact that homopterans, unlike hemipterans, have the same texture of both the front wings and the hind wings. Some homopterans have one pair of wings, some have two, and some have none. They also have a beak like Hemipterans, except their beak comes from the back part of the head. They have piercing-sucking mouthparts. All are plant feeders. Most are found on or around plants. Cicadas are found in trees in the summer. They make loud buzzing sounds. Homopterans undergo simple metamorphosis. Some aphids can lay eggs or give live birth!
ORTHOPTERA (Or thop' ter uh)
The insects in this order include: grasshoppers, crickets, and katydids. The word "ortho-" means straight, so these insects are named because they have two pairs of straight wings. Their front wings are thicker and lay on top of the hind wings. Most of these insects are plant feeders and can be found hopping or jumping around in the grass or in fields of flowers. They have chewing mouthparts and undergo incomplete metamorphosis.

Matching Insects To Their Order
Match each insect listed to the correct order. All the blanks should be filled when you are done.

____ BLATTARIA
____ COLEOPTERA
____, ____ DIPTERA
____, ____ HEMIPTERA
____, ______, ______, HOMOPTERA
____, ______, ______ HYMENOPTERA
____, ______ LEPIDOPTERA
____ MANTODEA
____, ______ ODONATA
____, ______ ORTHOPTERA

A. ant
B. aphid
C. butterfly
D. chinch bug
E. cicada
F. cockroach
G. cricket
H. damselfly
I. dragonfly
J. grasshopper
K. honey bee
L. house fly
M. lace bug
N. leafhopper
O. mosquito
P. moth
Q. praying mantis
R. stag beetle
S. wasp
Other Insect Orders

LESSON FOUR showed the ten most commonly found insect orders for general collections. The following are insect orders that are not as common or are found near water.

**DERMAPTERA** (Der mop' ter uh): (earwigs)
Wings: May have one or two pair of membranous wings or be wingless
Mouthparts: Chewing
Metamorphosis: Incomplete
Note: They are found in damp or dark areas around your home. They have distinct pinchers at the tip of their abdomens. It was once believed these insects crawled into ears while people were asleep!

**ISOPTERA** (I sop' ter uh): (termites)
Wings: Worker termites are wingless. Others have two pair of membranous, same length wings.
Mouthparts: Chewing
Metamorphosis: Incomplete
Note: These insects resemble ants and live in colonies. You can find them around decaying wood since that is their main source of food.

**EPHEMEROPTERA** (E fem er op' ter uh): (mayflies)
Wings: Two pairs, membranous. First pair much larger than the second.
Mouthparts: None
Metamorphosis: Incomplete
Note: These insects spend all but one day of their lives in the water. They emerge as adults, fly out of the water, mate, lay eggs, and die all within a day or two. They have no mouthparts as adults because they don't live long enough to need food.

**MECOPTERA** (Me cop' ter uh): (scorpionflies)
Wings: Two pairs, long and narrow
Mouthparts: Chewing
Metamorphosis: Complete
Note: These insects are named scorpionflies because the end of their abdomen is turned up like the stinger of a scorpion. They cannot sting you and are quite gentle.
NEUROPTERA (Nur op’ ter uh): (dobsonflies, lacewings, antlions)
Wings: Two pairs, membranous
Mouthparts: Chewing
Metamorphosis: Complete
Note: The name "neuroptera" means "nerve wings" because their wings have many veins in them. Some larvae in this order are found in the water. Lacewings are probably the most common insect found in this order.

THYSANURA (Thy san your’ uh):
(silverfish)
Wings: None
Mouthparts: Chewing
Metamorphosis: Simple
Note: These insects are likely to be found in your bathroom or running along a bookshelf. They tend to like starchy foods like wallpaper or book glue. They run fairly quickly and are hard to catch. If squished, their insides are very powdery because of their diets.

TRICHOPTERA (Tri cop’ ter uh):
(caddisflies)
Wings: Two pairs
Mouthparts: Chewing
Metamorphosis: Complete
Note: The larvae of caddisflies are found in ponds, lakes or streams. Some types of larvae make cases of twigs, leaves and silk around their bodies. The adults look like moths.

PLECOPTERA (Play cop’ ter uh):
(stoneflies)
Wings: Two pairs, membranous
Mouthparts: Chewing
Metamorphosis: Incomplete
Note: These insects are usually found near streams. Adults can be found resting on bridges or fence posts near water sources.

PHASMIDA (Faz’ mid uh):
(walking sticks)
Wings: none
Mouthparts: chewing
Metamorphosis: Incomplete
Note: These insects resemble twigs on trees or bushes. They can release a bad smelling odor to scare away predators. They can also grow back most of lost legs.
The following insect orders are so small that is unlikely that you will catch them and be able to display them properly.

**COLLEMBOLA**  
(Coal lem' bowl uh): (springtails)  
Wings: None  
Mouthparts: Chewing  
Metamorphosis: Simple  
Note: These insects are common, but are rarely seen because of their small size and their hidden habitats. Most springtails live in the soil, in leaf litter or in bark. They get their name from the fact that they can jump very high when disturbed.

**SIPHONAPTERA**  
(Sigh fun apt' ter uh): (fleas)  
Wings: None  
Mouthparts: Piercing-sucking  
Metamorphosis: Complete  
Note: Fleas are usually found on common household dogs and cats. They can get into the carpet and bother humans as well. They feed off the blood of animals. They can jump very high. Like lice, fleas can carry diseases.

**THYSANOPTERA**  
(Thigh san opt' ter uh): (thrips)  
Wings: Two pairs or none  
Mouthparts: Piercing-sucking  
Metamorphosis: Incomplete  
Note: These insects are small and are found on plants. They can cause serious damage to several kinds of crop plants by sucking the juices out of the plant.
Activity: The less common insects

1. Which insect builds a house or case around it's body
   A. scorpionfly
   B. caddisfly
   C. earwig

2. Which insect has no mouthparts as an adult because it only lives as an adult for a day or two?
   A. silverfish
   B. termite
   C. mayfly

3. Which insect has what looks like a poisonous tail?
   A. termite
   B. antlion
   C. scorpionfly

4. Which insect was once thought to crawl into a part of your body while you were sleeping?
   A. earwig
   B. thrips
   C. flea

5. Which insect might you find in your bathroom?
   A. springtail
   B. silverfish
   C. caddisfly

6. Which insect has the ability to regrow part of a missing leg?
   A. louse
   B. walking stick
   C. mayfly
GLOSSARY

abdomen: (ab' dim in) the part behind the thorax and contains the organs of digestion and reproduction

antennae: (an ten' ay) rod or feather-shaped projections on the front of the head serving as organs of touch and sometimes taste, smell, and hearing. They are often called "feelers."

Arachnid: (a rak' nid) spiders and their relatives

Arthropods: (Arth' ro pods) the phyla that insects are in that means "jointed legs"

Chilopoda: (Chill a pode' a) centipedes

chitin: (kite' in) the material that the exoskeleton of an insect is made up of that is the same material that is found in your fingernail

complete metamorphosis: (met a more' foe sis) four different stages of growth: the egg, larva, pupa and adult as found in butterflies, moths, flies, bees, wasps and beetles

exoskeleton: (eks o skell' it tin) a skeleton (hard covering) on the outside of the body that gives an insect protection.

incomplete metamorphosis: (met a more' foe sis) a process of change in which insects such as grasshoppers, termites, true bugs, aphids, leafhoppers and earwigs hatch from an egg and become a nymph and molt and develop a full set of wings thereby becoming an adult

Insecta: (In seck' tuh) insects

invertebrates: (in vert' i brates) animals without a backbone

key: a set of characteristics about a topic that is organized in a stepwise way to help one eliminate categories and identify a particular insect.

larva: (lar' va) the immature stage of the insect that occurs after hatching from the egg in insects that undergo complete metamorphosis, sometimes resembling caterpillars or worms.

membranous wings: (mem brain' us) clear wings with veins showing through as in a dragonfly

metamorphosis: (met a more' foe sis) a process in which insects grow up and change form

Millipoda: (mill a pode' uh) millipedes
molting: (molt' ting) the process in which an insect sheds its skin to grow larger until it is the full size of the adult.

naiad: (ny' add) the nymphal stage in some aquatic insects

nymph: (nimf) immature stage of an insect that doesn't have wings

proboscis: (pro bos' sis) a siphoning mouthpart in butterflies and moths that is like a straw to help suck up nectar

prothorax: (pro thor' axe) part of the neck area of insects that is used for pinning some insects

pupa: (pew' puh) the stage of complete metamorphosis between the larva and the adult

scales: minute, shingle-like parts of the wings of butterflies and moths that rub off in like powder

scientific name: a Latin name given to insects that is made up of the genus and species

scutellum: (skew tell' um) the triangular area between the bases of the wings on some insects

simple metamorphosis: (met a more' foe sis) the process of metamorphosis in which insects such as silverfish, springtails, lice hatch from an egg and look exactly like a small form of the adult insect

siphon: (si' fun) tube-like mouthpart that takes up food source

thorax: (thor' axe) is the middle part of an insect where the legs and wings are attached
More about the insect body...

An insect’s thorax (the middle section) has three segments. All insects have a pair of legs on each segment, and adults have 2 pairs of wings - one pair on the second segment and the other pair on the third segment. Also, the second and third thoracic segments each have a pair of spiracles (see below).

An insect’s abdomen has eleven segments. The abdomen is where many of the insect’s internal organs are located (the reproductive organs, digestive organs, and excretory organs). The first eight abdominal segments each have a pair of spiracles (see below).

Insects need oxygen to live, just like we do, but they do not have lungs! Instead, insects ‘breathe’ through a series of tubes that extend from the outside world into the body. Special openings, called spiracles, allow oxygen to flow into these tubes, and carbon dioxide to flow out. There are a total of ten pairs of spiracles on the outside of the insect’s body; two pairs are on the thoracic segments and the other eight pairs are on the abdominal segments.
CURRICULUM GUIDES
Bug Wise (Pamela, Hickman, Addison-Wesley) (8.95)
Insects: A Learning Works Mini-Unit for Grades 1-4 (Beverly Armstrong) (5.95)
Creepy Crawlies Thematic Unit (Teacher Created Material, Inc.) (7.95)
Creepy Crawlies for Curious Kids (Teacher Created Material, Inc.) (5.95)
Entomology (Zephyr Learning Packet) (19.95)
Ecology, Learning to Love Our Planet (Zephyr Learning Packet) (19.95)
The Original Backyard Scientist (Jane Hoffman) (13.00)
The Insect Appreciation Digest (Tom Turpin, Entomological Foundation) (13.00)
Teacher and Student Insect Identification Study Guide (Gary Dunn, Young Entomologists' Society) (6.95)
Six-Legged Science: Insects in the Classroom (Gary Dunn, Young Entomologists' Society) (6.95)
The Insect Workbook (Anna Leahy, Entomological Society of America) (Insects: Make It Work!)
Hide a Butterfly Teacher's Guide (preschool - K) (Great Explorations in Math and Science, Lawrence Hall of Science, UC Berkeley)

BOOKS
Be a Bug Detective (Charman & Erskine, Derrydale) (10.00)
Invisible Bugs and other Creepy Creatures That Live With You (Susan Lang, Sterling Publ.) (12.95)
Creepy Crawlies (Sterling Publ.) (9.95)
Amazing Insects, Eyewitness Juniors #26 (Knopf) (7.99)
Joyful Noise: Poems for Two Voices (Paul Fleischman, Harper & Row)
Entertaining with Insects (R.L. Taylor and B. J. Carter, Salutek Publ.)
Looking at Insects (David Suzuki w/Barbara Hohner, John Wiley) (9.95)
The Insect Appreciation Digest (F. Tom Turpin, Entomological Foundation)
Insect (Laurence Mound, Alfred A. Knopf)
Extremely Weird Insects (Sarah Lovett, John Muir Publications)
Pet Bugs: a Kid's Guide to Catching & Keeping Touchable Insects
Amazing Insects (Eyewitness Junior Book Series)
Ninety-nine Gnats, Nits, and Nibbles (May Berenbaum, Univ. Illinois Press)
Ninety-nine More Maggots, Mites, and Munchers (May Berenbaum, Univ. Illinois Press)
A Shimmer of Butterflies
Insects Do the Strangest Things
Insects: Photobook
The Pratical Entomologist (Rick Imes)
Observing Insects (Donald Stokes, Little, Brown)

(8.00)
(9.95)

CATALOGS
Y.E.S. International Entomology Resource Guide
(1915 Peggy Place, Lansing, MI 48910)
(Ecological Society of America)
Buggy Bookstore Catalog (Young Entomologists' Society
(1915 Peggy Place, Lansing, MI 48910 ph. 517-887-0499)
Insect Lore (1-800-548-3284)
Rainbow Mealworms (1-800-777-9676)

POSTERS
Our Earth Alphabet
Beetles
Butterflies

(12.00)
(10.50)
(10.50)

EQUIPMENT AND SUPPLIES
Acorn Naturalists, 17300 E. 17th St., Ste. J-236, Tustin, CA 92680
BioQuip Products, Inc., 17803 La Salle Ave., Gardena, CA 90248
Carolina Biological Supply Co., Gladstone, OR 97027
Student Science Service, 622 W., Colorado St., Glendale, CA 91024
Turtox/Cambosco, 8200 S. Hoyne Ave., Chicago IL 60620
Ward's Natural Science Establishment, 11850 Florence Ave., Sante Fe Springs, CA 90670

SOCIETIES AND ORGANIZATIONS
The Coleopterists Society, Field Museum of Natural History, Roosevelt Rd. at Lakeshore Dr., Chicago, IL 60605
Entomological Society of America, 9301 Annapolis Rd., Lanham, MD 20706
The Lepidopterists Society, 3838 Fernleigh Ave., Troy, MI 48083
Lorquin Entomological Society, c/o The Insect Zoo. Natural History Museum, 900 Exposition Blvd., Los Angeles, CA 90007
Pacific Coast Entomological Society, California Academy of Sciences, Golden Gate Park, San Francisco, CA 94118
Sonoran Arthropod Studies, Inc., P.O. Box 5624, Tucson, AZ 85703
The Xerces Society, 10 SW Ash St., Portland, OR 97204
Young Entomologists Society, 1915 Peggy Place, Lansing, MI 48910

INSECT NEWSLETTERS
BugBits, PSU Department of Entomology, 501 ASI Bldg., University Park, PA 16802 ($5 annual subscription)
Danaus, California Monarch Studies, Santa Monica College, Life Sciences, 1900 Pico Blvd., Santa Monica, CA 90405
Flutterings, Rocky Mountain Butterfly Consortium, P.O. Box 280702, Lakewood, CO 80220
The Food Insects Newsletter, Department of Entomology, University of Wisconsin, Madison, WI 53706
the instar, Sonoran Arthropod Studies, Inc., P.O. Box 5624, Tucson, AZ 85703
The Monarch Newsletter, The Monarch Program, P.O. Box 178671, San Diego, CA 92177
Network, The Lorquin Entomological Society, c/o The Insect Zoo.
Natural History Museum, 900 Exposition Blvd., Los Angeles, CA 90007
Scarabs, 3889 Walnut Ave., Chino, CA 91710

SOME INSECT ZOOS AND BUTTERFLY HOUSES IN NORTH AMERICA
Birmingham Zoo Insectarium, 2630 Cahaba Rd., Birmingham, AL 35223
Butterfly Exhibit, San Diego Wild Animal Park, 15500 San Pasqual Rd., Escondido, CA 92027
Butterfly World, 3600 W. Sample Rd., Coconut Creek, FL 33073
Butterfly World, Marine World Africa USA, Marine World Pkwy., Vallejo, CA 94589
Cincinnati Zoo Insectarium, 3400 Vine St., Cincinnati, OH 45220
Cushings Butterfly Farm, 1512 Jenny Ln., Richmond, TX
Day Butterfly Center, Callaway Gardens, Pine Mountain, GA 31822
Fort Worth Zoological Park Insectarium, 2727 Zoological Park Dr., Fort Worth, TX 76110
L'Insectarium de Montreal, 4581 Sherbrooke Est, Montreal, Quebec, CANADA
Mackinac Island Butterfly House, Sawyers Greenhouse, 1308
McGaulpin, Mackinac Island, MI 49757
National Zoological Park, 3000 Connecticut Ave. NW, Washington DC 20008
Ontario Butterfly House, RR1, Hillsborough, Ontario N0B 1Z0, CANADA
Ralph M. Parsons Insect Zoo, Natural History Museum, 900 Exposition Blvd., Los Angeles, CA 90007
San Francisco Zoological Society Insect Zoo, Sloat Blvd. at the Pacific
INTERACTIVE SOFTWARE AND CD'S
Discovering Insects (Order through: Douglas E. Drenkow, Drenkow Media, 10306 E. Live Oak Ave., Arcadia, CA 91007)

VIDEOS AND MUSIC
What's Buzzin'
Rainbow Reader
Bugs Don't Bug Us (Insect Lore: 1-800-livebug)
Why Honey Bees? (Available through Ag Information Services at Penn State University: 814-865-6309)
"Tell Me Why" Video Series: Insects (Insect Lore: 1-800-livebug)
Insects, Bugs, & Squiggly Things (Cassette) (Insect Lore: 1-800-livebug)
Creepy Crawly Songbook (Hiawyn Ovan, Carl Davis, Satoshi Kitamura Fauvar, Straus, and Giroux)

PUDDLETS
- caterpillar/butterfly
- grasshopper
- ant
- dragonfly
- praying mantid

GAMES
The Pollination Game (Ampersand Press Insect Lotto (Safari, Ltd.)
Nectar Collector (Animal Town : 1-800-445-8642)
Bug Jug (Insect Lore: 1-800-livebug)
The Bug House (Insect Lore: 1-800-livebug)
Make Your Own Insect House (Insect Lore: 1-800-livebug)
The Bug Book and Bottle (Insect Lore: 1-800-livebug)
Insect Rummy (Safari Ltd.)
Ant Trails (Dan Gilbert, Great American Puzzle Factory)
Jungle Bungle Butterfly Game (Dan Gilbert, DaMert Company)
Jungle Bungle Beetle Game (Dan Gilbert, DaMert Company)

MISC
- Bug Kit Rubber Stamps (Rubber Stampede)
- Zoo Books

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(8.95)
(8.95)
(11.95)