

Module I
DISCOVERY



Complete Module I before starting other modules. These four activities give you basic information needed for future activities -- like what is and what isn't an insect. Have fun and explore.

WHAT AN INSECT IS

It isn't always easy to tell when something is an insect. Flies, mosquitoes and butterflies ARE insects. This activity will help you understand why.

NEEDED:

Paper and drawing materials

LEADER DOES:

- 1- Look over INFORMATION YOU WILL NEED.
- 2- If possible, find a large, detailed illustration of an insect to pass around, or show a film (see RESOURCES).
- 3- Involve members in discussing the characteristics of insects.

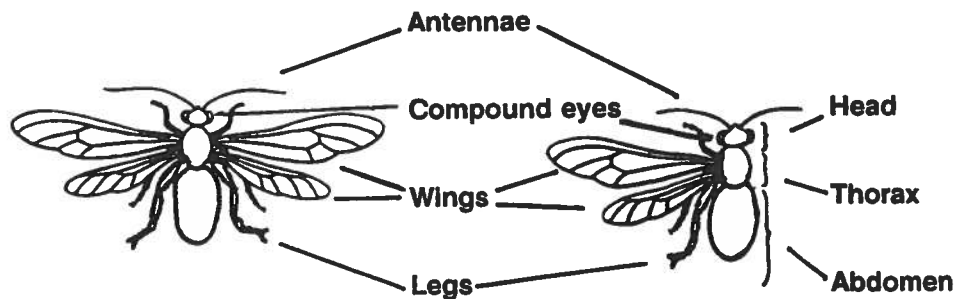
MEMBERS DO:

- 1- Discuss what insects are like.
- 2- Choose an insect you are familiar with and draw a picture of it.
- 3- Label these body parts -- legs, wings, antennae, head, thorax, abdomen and compound eyes.

GOING FURTHER:

Create a three-dimensional insect using things you find around the house like cardboard, plastic bags, wire, styrofoam, cloth, twist ties, pipecleaners, etc. After you're finished, label the insect's body parts.

INFORMATION YOU NEED:



Sketch of an Insect Showing Body Parts

In their adult form, all insects have:

- Bodies divided into three parts -- head, thorax, and abdomen;
- Three pairs of legs, attached to the thorax;
- One pair of antennae, attached to the head.

Most insects also have two pairs of wings, attached to the thorax. However, wings are completely absent in some insects like lice, fleas and ants. Others, like houseflies, have only one set of wings.

RESOURCES:

Handbook of the Insect World. Hercules Powder Co. (May be available from your county 4-H office.)

How to Know the Insects by H. E. Jacques. William C. Brown Co.

Insects by Casey Horton. Gloucester Press, 1984.

Insects: A Guide to Familiar Insects. Golden Nature Guide.

Films available from Bureau of Audio Visual Instruction (BAVI), P. O. Box 2093, Madison, WI 53701-2093:

- "Insects and their Homes"
- "Insects: How to Recognize Them"
- "The Insect Alternative"

WHAT'S NOT AN INSECT?

Some animals look like insects -- but are not. This activity will help you know the difference.

NEEDED:

- String or yarn
- Six large index cards or heavy paper
- Paper punch
- Paper and pencil or pen

LEADER DOES:

- 1- Look over INFORMATION YOU WILL NEED section.
- 2- Involve members in discussing what insects are and what they aren't.
- 3- Help members construct mini-scrapbooks using index cards and string.

MEMBERS DO:

- 1- Discuss what small bug-like creatures are not insects.
- 2- Make your own mini-scrapbook, labeling the pages as follows:
 - Cover -- "The Non-Insect Mini-Scrapbook"
 - Page 1 -- "Spiders"
 - Page 2 -- "Centipedes"
 - Page 3 -- "Millipedes"
 - Page 4 -- "Earthworms"
 - Page 5 -- "Other"
- 3- On each page draw the animal named, choosing your own for "Other" (options include snail, crayfish, sow bug). Under each give at least one reason why the animal is not an insect.

INFORMATION YOU NEED:

TABLE OF NON-INSECTS

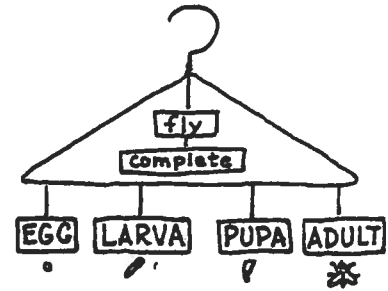
	Insects	Spiders	Millipedes	Centipedes	Crustaceans (sow bugs, etc.)
Body Divisions	3	2	2 distinct	2 distinct	2 distinct
Legs	3 pair (6)	4 pair (8)	2 pair per segment	1 pair per segment	variable
Antennae	1 pair	0	1 pair	1 pair	2 pair
Wings	2 pair (usually)	0	0	0	0

CHANGING FORMS

Almost all insects begin life as small eggs. After hatching, they go through several changes in form called metamorphosis. You will learn about insect life cycles in this activity.

NEEDED:

- String
- Clothes hanger
- Stiff paper
- Crayons or markers



LEADER DOES:

- 1- Provide a life-cycle chart (see next page) for each member.
- 2- Guide members in discussing the changes insects go through. Ask if they have seen insects in any form other than as adults. What is the difference between complete and incomplete metamorphosis? Have they ever seen a cocoon become a butterfly?
- 3- Have youth leader explain how to make a life cycle mobile (see the diagram).

MEMBERS DO:

- 1- Discuss what happens to insects as they go from eggs to adults.
- 2- Choose a familiar Wisconsin insect and build a mobile illustrating its life stages.

GOING FURTHER:

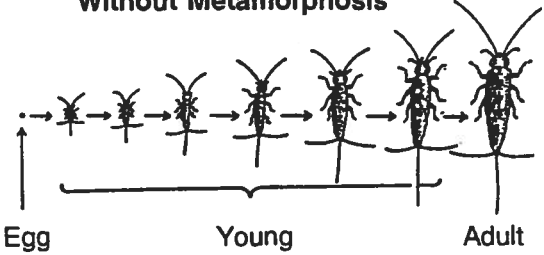
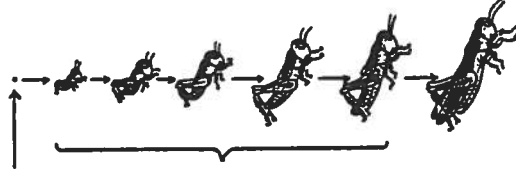
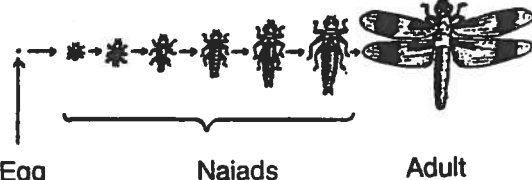
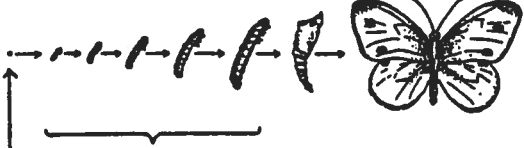
Make a poster as a fair display which shows the life cycles of several insects, giving examples of each type of life cycle shown on the chart.

RESOURCES:

Films available from Bureau of Audio Visual Instruction (BAVI), P. O. Box 2093, Madison, WI 53701-2093:

- "Life Cycle of a Honeybee"
- "Life Cycle of a Wasp"

METAMORPHOSIS OF VARIOUS INSECTS

<p><u>Examples</u> Silverfish Springtail Chewing Lice Sucking Lice</p>	<p style="text-align: center;">Without Metamorphosis</p> <p><u>Orders</u> Thysanura Collembola Mallophaga Anoplura</p>  <p style="text-align: center;">Egg Young Adult</p>	<p>Young resemble adults These never have wings</p>
<p><u>Examples</u> Grasshoppers Termites Booklice Thrips True Bugs Aphids Earwigs</p>	<p style="text-align: center;">Gradual Metamorphosis</p> <p><u>Orders</u> Orthoptera Isoptera Corrodentia Thysanoptera Hemiptera Homoptera Dermaptera</p>  <p style="text-align: center;">Egg Nymphs Adult</p>	<p>Young resemble adults All stages on land Adults have wings</p>
<p><u>Examples</u> Mayflies Dragonflies Stoneflies</p>	<p style="text-align: center;">Incomplete Metamorphosis</p> <p><u>Orders</u> Ephemera Odonata Plecoptera</p>  <p style="text-align: center;">Egg Naiads Adult</p>	<p>First two stages are in water Adults have wings</p>
<p><u>Examples</u> Lacewing Beetles Scorpion Fly Caddisfly Moths, Butterflies Flies Fleas Wasps, Bees</p>	<p style="text-align: center;">Complete Metamorphosis</p> <p><u>Orders</u> Neuroptera Coleoptera Mecoptera Trichoptera Lepidoptera Diptera Siphonaptera Hymenoptera</p>  <p style="text-align: center;">Egg Larvae Pupa Adult</p>	

INSECT IDENTIFICATION

Insects are classified or identified by their special characteristics. This game will help you learn how entomologists tell insects apart.

NEEDED:

- Two or more (depending on the number of members) copies of the "Insect Key" photocopied and taped together
- Colored pencils, or light-colored markers or crayons

LEADER DOES:

- 1- With youth leader's help, prepare enough copies of the Insect Key so that members can refer to them when they divide into teams for the Bug Hunt. Note that for ease in duplication, the Insect Key has been printed on four separate pages. Reassemble by taping pp. 10-11 together to form the "winged" specimens of insects and pp. 12-13 for the "wingless" specimens.
- 2- Practice using the key; find your own answers to the questions listed on the bug.
- 3- Explain the hunt (read MEMBERS DO) and how to use the key for identification and classification. Allow 15 to 20 minutes for the teams to finish.

MEMBERS DO:

- 1- Using the Insect Key, find which five insects best fit the five descriptions on the insect. When you think you have an answer, write it down and color that part of the insect drawing.

GOING FURTHER:

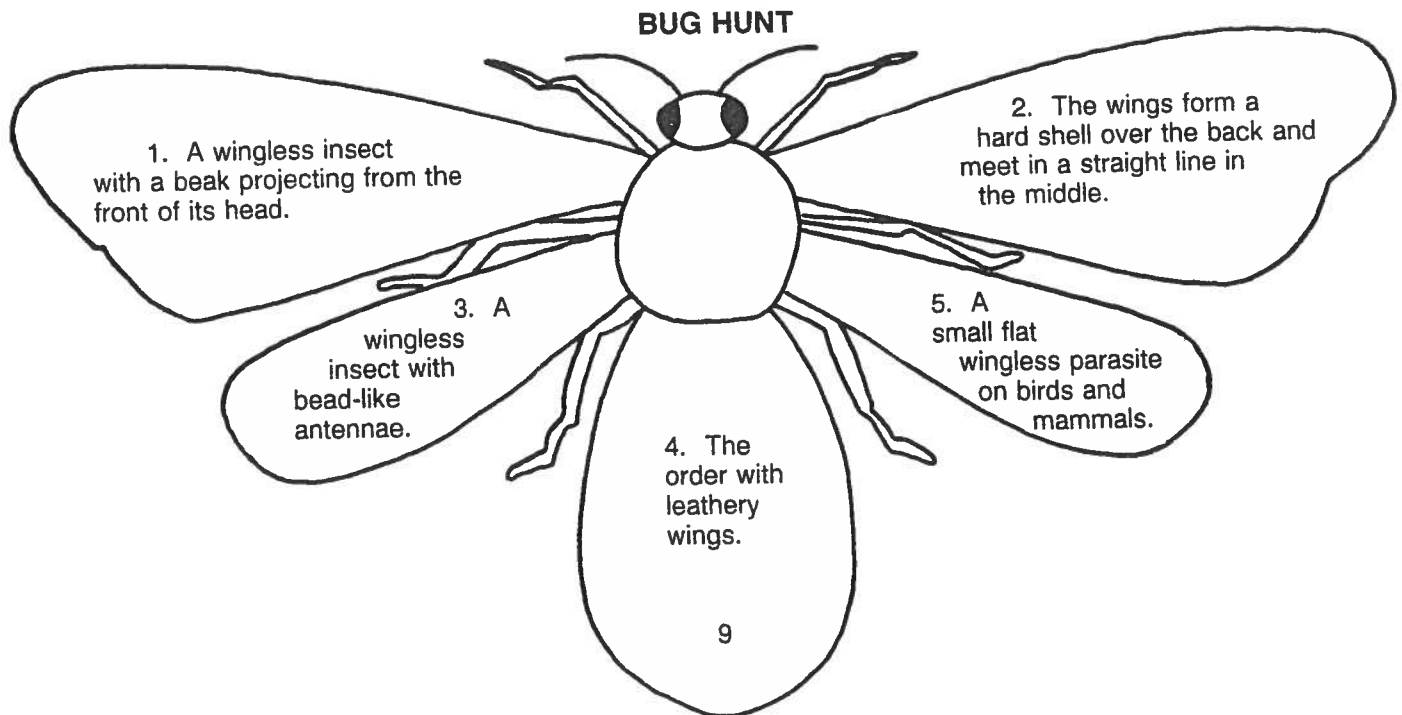
Practice using the key at home. Choose familiar insects and classify according to scientific classification as follows:

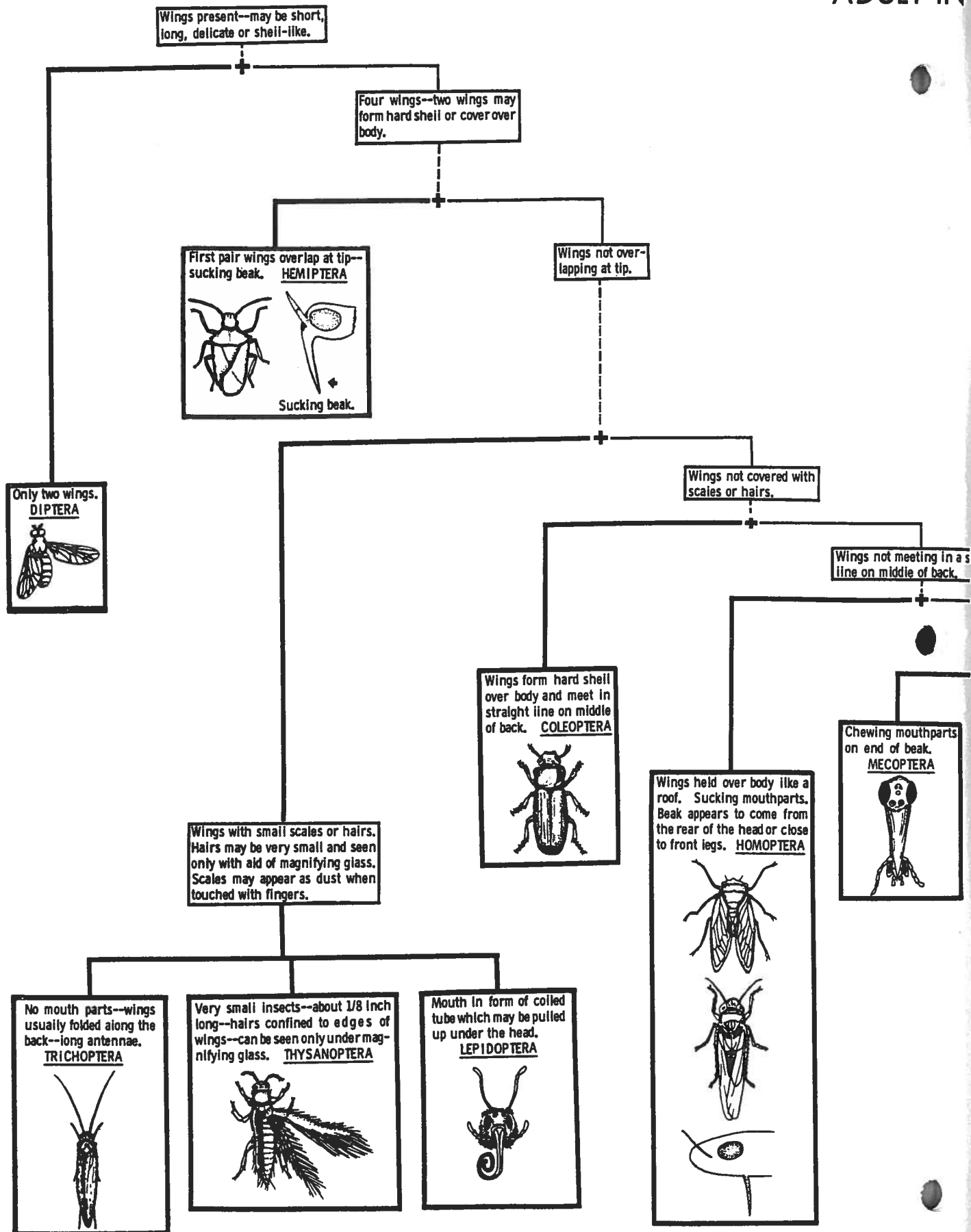
Kingdom _____ Phylum _____ Class _____ Order _____
 Family _____ Genus _____ Species _____ Common name _____

NOTE: The key provided with this activity will help you identify and classify insects only to order. Specialized books, such as those listed in the "What An Insect Is" activity, are need if you wish to identify insects to family. To accurately identify insects to genus and species requires specialized books and years of training.

RESOURCES:

- Film available from BAVI, P. O. Box 2093, Madison, WI 53701-2093:
- "Order of Insects"





SECT SPECIMENS

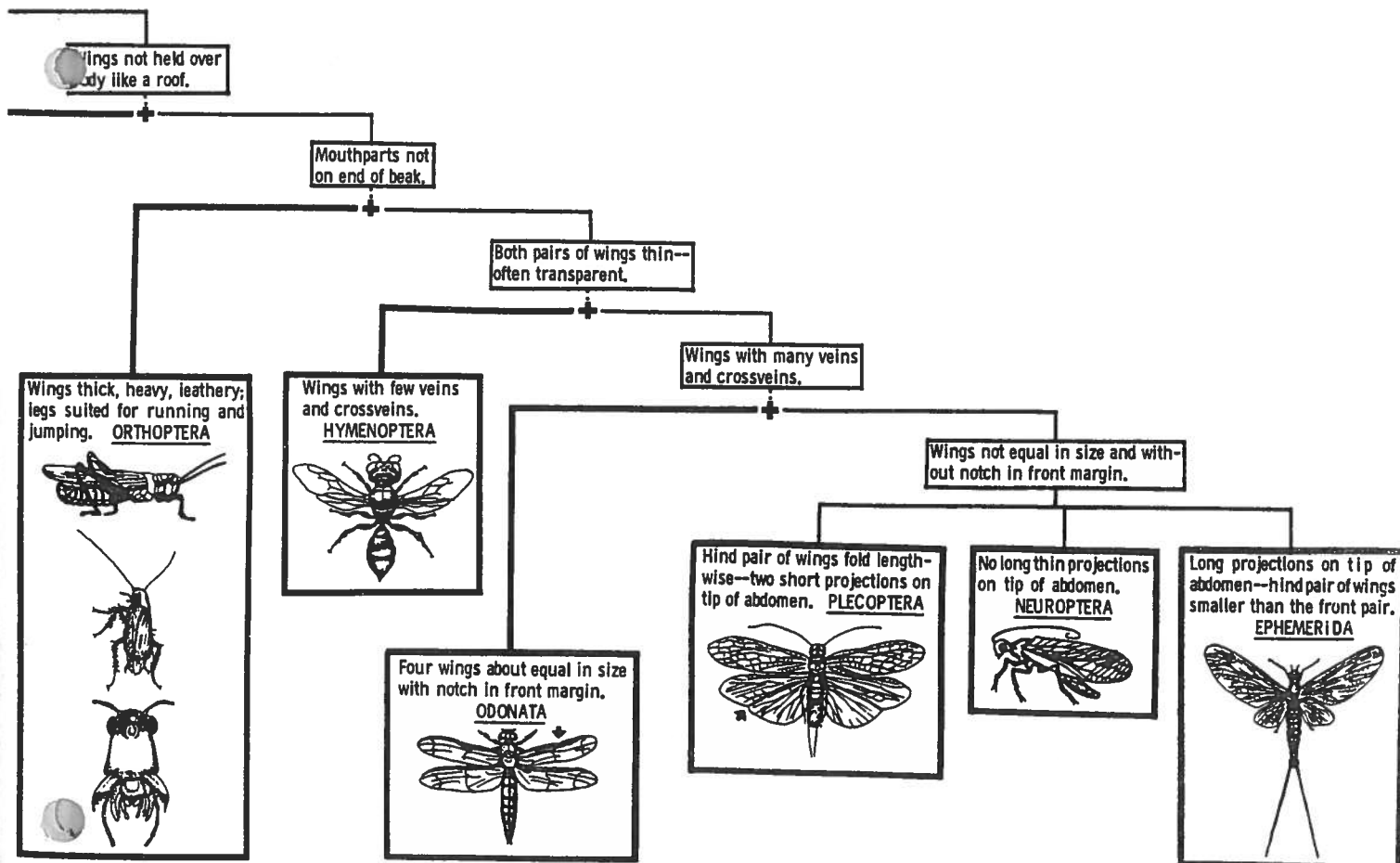
Winged

HOW TO USE THIS KEY

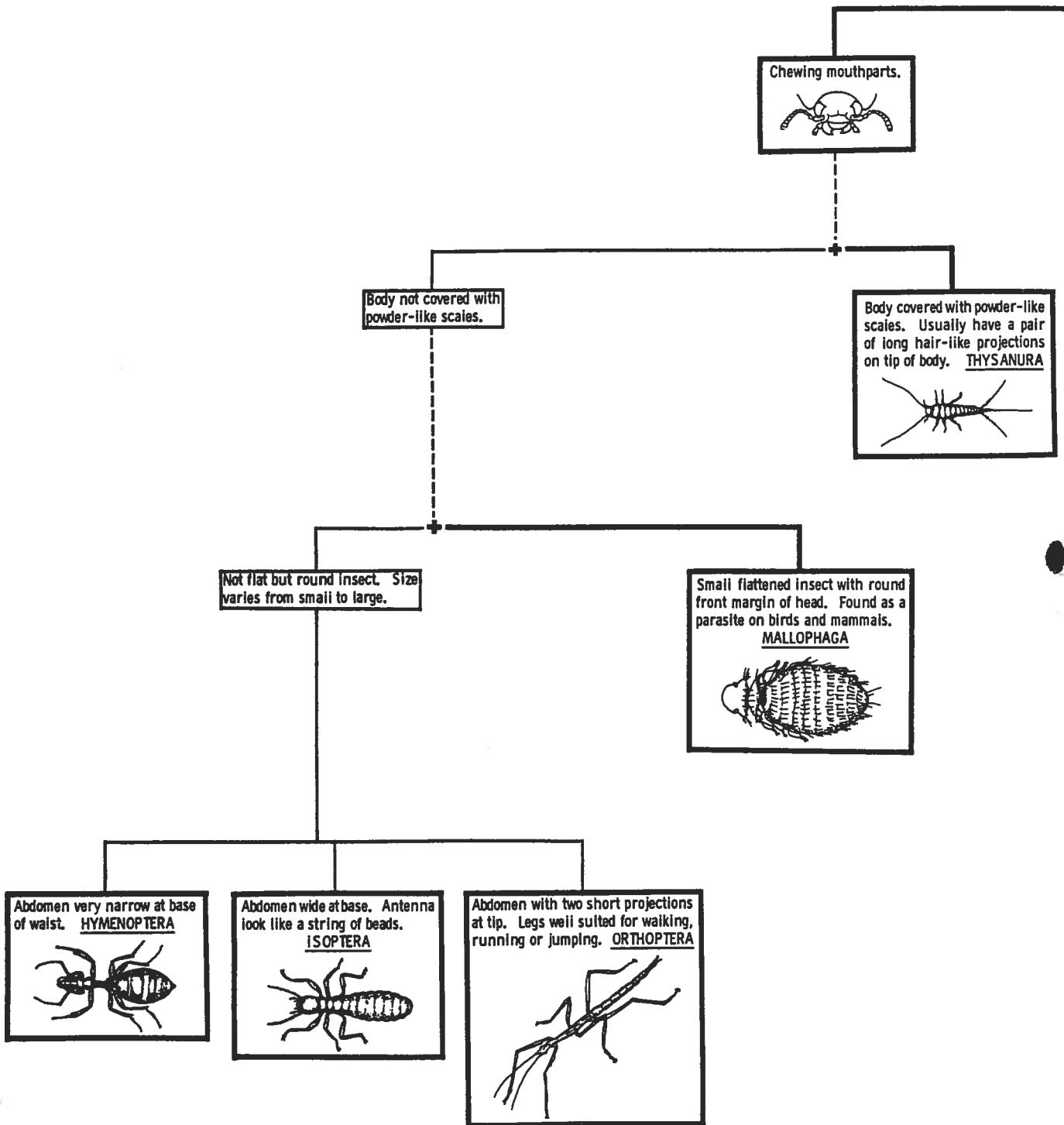
This key is designed to help identify only adult insects so make certain you have an adult insect. Special keys are required to identify immature insects.

If the insect has wings--use this side of the key. If the insect is without wings use the other side. Insect wings vary in their appearance from very delicate membranes to hard-leathery shell-like structures. Starting at the top, follow the broken line to the crossroad (+). At the crossroad you must go either one of two or three ways. Always try the heavy line first. If the description fits your specimen and an order name is in the box, you have identified your specimen. If the description does not fit your specimen, then go back to the crossroad (+) and take the other road. This description should fit your specimen. Continue following the line to the next crossroad and repeat the procedure by again taking the heavy line to the order.

straight



No wings pres



INSECT SPECIMENS

Key

present in adult state.

Mouthparts not chewing--
may be piercing, sucking
or siphoning.



Body flattened sideways (compressed).
Legs are fitted for jumping. Small dark-
colored insects. SIPHONAPTERA



Body not flattened sideways.
Legs not fitted for running
or jumping.

Mouthparts have a long beak.

Mouthparts not jointed. May be
fleshy or beak may appear absent.

Antennae not hidden in pits but
visible from above. Legs have one
claw. ANOPLURA



Antennae hidden in pits of head--
not seen from above. Body looks
like a tick. DIPTERA



Beak projects from the front part of head. HEMIPTERA



Beak appears to come from the rear of the head or close
to front of legs. HOMOPTERA

