

## Your 4-H Insect Collection

An insect collection is a great way to get involved in the 4-H Entomology Project. This packet contains information to help you start your collection, including:

- Suggested fair projects
- Making a collecting jar
- Pinning insect specimens
- A key to commonly found insects
- Labeling your insect specimens
- Making an insect display box
- Fair display tips for insect collections



Developed by Paula Huff  
Oconto County 4-H Youth Development Agent  
University of Wisconsin Extension, 2003

An EEO/Affirmative Action employer, University of Wisconsin-Extension provides equal opportunities in employment and programming, including Title IX and ADA requirements. Bee graphic from the University of Florida 4-H Program

# Entomology Fair Projects

## Insect Collections

If you are doing an insect collection, consider doing a “themed” collection, such as one of the following:

- Insects collected at night vs. those collected during the day
- Insects found near the water
- Colorful insects
- Carnivorous insects and their prey
- Insects that spend their larval stage in the water
- Nest-building insects
- Insects that are attracted to light

Collections must not contain specimens of bees, or any endangered or threatened species.

# Entomology Project

## Tools of the Trade

### Collecting Insects for Display –Kill Jars

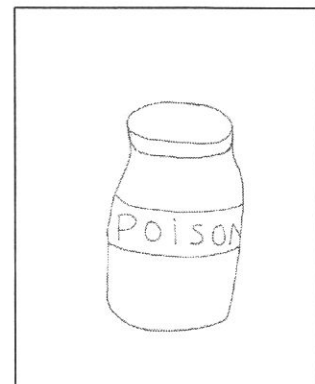
Insect collectors have two basic options for killing their insects quickly.

The easiest method is to simply place the insect in a plastic vial or an envelope, and put it in the freezer. Don't leave them in the freezer too long or they may become brittle.

The other method is to use a kill jar. Kill jars can be made relatively easily, and used safely by youth who understand the implications of handling chemicals. The chemical recommended for this kill jar is ethyl acetate (fingernail polish remover). Even though this is a relatively common household product, it is important that collectors follow safe handling procedures when dealing with this chemical, including taking precautions to make sure that the fumes are not inhaled, and always following good hand-washing practices following use.

### Directions for making a Kill Jar

1. Obtain a clear glass jar with a screw-type lid. A small jam or jelly jar is perfect.
2. Wrap masking tape or duct tape in strips around the sides and the bottom of the jar. This will help prevent the jar from shattering should it be dropped.
3. Write POISON in big letters along the side.
4. Mix a small amount of plaster of Paris with water, in the proportion recommended on the package. The right consistency is about that of a milkshake.



5. Quickly pour the plaster mixture into the bottom of the jar. Leave the lid off until the plaster is set.
6. When the plaster is set, you can ready the kill jar by adding a small amount of ethyl acetate (fingernail polish remover) to the plaster—just enough to lightly wet the plaster. The plaster will absorb the chemical, and your jar will be ready.

---

Always keep the lid tightly on the jar. You will need to recharge (add more ethyl acetate) your jar occasionally.

Large insects will need to be left in the jar longer than smaller insects, and the time will depend on the strength of your chemical. Pin your insect as soon as possible. Insects that are left too long before pinning often become brittle. It's best to do it on the same day.

Make sure that you note where and when you collected your insect. That information is an important part of your display.

# Entomology Project

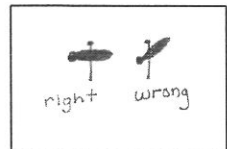
## Pinning Insect Specimens

Scientists have a certain way of pinning insects that allows them to closely study the specimen. This special way of pinning preserves the important diagnostic characteristics of the insect. With proper pinning and labeling, your insect specimen has the potential of adding to scientific knowledge.

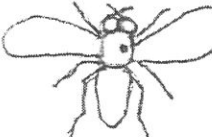

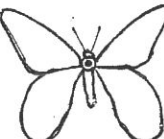
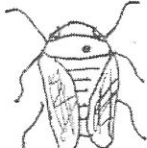

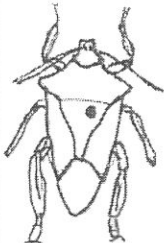
Insects should be pinned with special insect pins that can be obtained through scientific supply houses like Carolina Biological (1-800-334-5551).

The first thing that you will need to know about your insect BEFORE you pin it, is the order to which it belongs. You can use any simple insect key or insect guide to determine the order. The pin placement varies with insect order. The information on the next page shows where to place the pin for commonly found insect orders in our area.

Once you know where to put the pin, place the insect on a surface for pinning. Gently push the pin through the insect at the proper location. The insect should be level on the pin. This is harder than it sounds. It will take some practice until you can do this correctly nearly every time.



All insect specimens will benefit from a little extra “grooming” before they are dry. Smooth out antennae and legs so that they look as natural as possible. Some insects will need some additional work before their pinning is done. Butterflies and moths will need a great deal of specialized work to get their wings in the proper condition. Insects with long abdomens like butterflies and dragonflies may need a piece of stiff paper placed under their abdomens to prevent it from drying in a drooped condition. Simply remove the paper when the insect has dried.

Orders	Pinning Location	Example
Diptera (flies) Hymenoptera (bees)	Pin through thorax – slightly to the right of center. Try to pin in a line where the forewing joins the body.	
Coleoptera (beetles)	Pin through the right wing cover about ¼ of the way down the back.	
Lepidoptera (butterflies) Odonata (dragonfly) Neuroptera (lacewings)	Pin through center of thorax (or slightly to the right).  Wings need to be spread on Lepidoptera.	
Homoptera (cicadas)	Pin through the thorax to the right of center.	
Orthoptera (Grasshoppers and Crickets) Blattodea (Roaches)	Pin right through the middle of the thorax, slightly off-center. The right wing is often spread on grasshoppers. You will need a special pinning board to do so.	
Hemiptera (True Bugs)	Pin directly through the triangular area on the back (this is known as the scutellum), slightly to the right of center.	

*Key to the Most Commonly Found*  
**Adult Insects with Wings**

This key will NOT work for every insect you find, but it will help you identify to order MOST of the insects that you find. Start with box 1 and follow the directions related to your choice. When you get to an order name (in CAPITAL letters), you have most likely found your insect's order. Check in an insect book to see if you can find the picture of your insect to get its common name. Please note that in some older books, the Order Orthoptera will include the roaches, walking sticks and praying mantis. The classification system used here is the most current.

**Box 1.** Choose a or b.

- a. Insect has 2 wings (1 pair).....order DIPTERA
- b. Insect has 4 wings (2 pairs).....Go to Box 2.



**Box 2.** Insects with two pairs of wings. Wings may or may not be hardened into a shell over the body. Choose a or b.

- a. First pair of wings overlap at tip; sucking mouthparts; note triangle on back.....HEMIPTERA
- b. First pair of wings not overlapping.....Go to Box 3



**Box 3.** Choose a or b.

- a. Wings with scales.....LEPIDOPTERA
- b. Wings without scales.....Go to Box 4



**Box 4.** Wings without scales. Choose a or b.

- a. Wings meet in a straight line on the middle of the back; wings also form hard shell on back.....COLEOPTERA
- b. Wings not meeting in a straight line on middle of back...Go to Box 5



**Box 5.** Choose a or b.

- a. Wings held over body like a roof (note sucking mouthparts)  
.....HOMOPTERA
- b. Wings not held over body like a roof.....Go to Box 6



Box 6. Choose a or b.

- a. Heavy, thick legs used for running and jumping.....Go to Box 7
- b. Wings thin, often transparent.....Go to Box 8

Box 7. Choose a, b, c, or d

- a. Hind legs enlarged for jumping.....ORTHOPTERA
- b. Running legs; head hidden from above by a hood-like structure .....BLATTODEA
- c. Front legs enlarged (with spines) for grasping prey...MANTODEA



Box 8. Choose a or b.

- a. Wings with few veins and crossveins.....HYMENOPTERA
- b. Wings with many veins and crossveins.....Go to Box 9



Box 9. Choose a or b.

- a. Wings nearly equal in size (note notch in front margin)..ODONATA
- b. Wings not equal in size.....Go to Box 10



Box 10. Choose a, b, or c.

- a. Hind pair of wings fold lengthwise on body; two short projections from tip of abdomen.....PLECOPTERA
- b. Two long, thin projections from tip of abdomen.....EPHEMEROPTERA
- c. No projections from tip of abdomen.....NEUROPTERA



Paula Rogers Huff  
4-H Youth Development Agent  
Oconto County

An EEO/Affirmative Action employer, University of Wisconsin-Extension provides equal opportunities in employment and programming, including Title IX and ADA requirements.



# Entomology Project

## Tools of the Trade

### Labels for your Insect Specimens

#### Insect Labels

An insect display is an important record of the insects that occur in any one area. To be of scientific value, the insect must be accompanied by a label which includes information about its collection. The label must include:

1. Location where the insect was collected  
(County, City, State)
2. Date that the insect was collected  
(written in scientific format like this: 14 February 2003)
3. Collector's name

Oconto Co., Lena WI  
14 February 2003 .  
P.R. Huff

The "locality label" is the one that is placed closest to the insect and, like the insect, must be at a uniform height on the pin. Those distances are easily made uniform with the help of a pinning block.

Locality labels must be small, legible, and permanent. A good size for a label is  $\frac{1}{2}$  x  $\frac{3}{4}$  inch. Cardstock is a good choice in paper because of its sturdiness. Using a very small font on your computer produces very neat, small labels. If you hand-print the labels, make sure that you use a permanent ink pen (not ball-point).

Labels should be pinned on the right hand side – centered between top and bottom, and about  $\frac{3}{4}$  of the width from the left-hand side (see dot on above labels).

For 4-H purposes, an additional identification label may be placed below the locality label (see box on right). This is the label that identifies the insect by common name and/or scientific name or order.

Darkling Beetle .  
Coleoptera

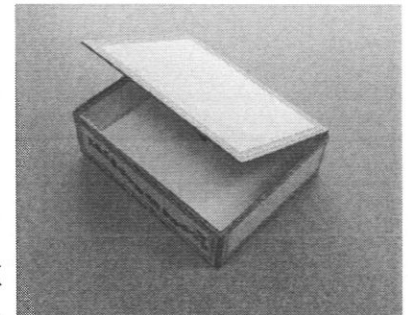
Or, if you prefer, identification information may be secured to the material on the bottom of the display box. These labels will be larger than those pinned with the insect. These should be able to be read easily by judges and other people who view your insects.

# Entomology Project

## Tools of the Trade Insect Display Boxes

### Display Box

A cigar box makes a good “starter” insect box. Contact paper can be used to cover the advertising. The box on the right was covered with contact paper and then decorated with ladybug stickers.



You will also need to add a base for the inside of the box. It must be a substance that you can stick pins into. The base can be cut to fit from Styrofoam or corrugated cardboard and should be glued securely to the bottom of the box. Your display background should be unobtrusive.

You will need to take precautions to protect your collection (from insects!). The easiest way to do this is to heat a pin (it will be HOT), put it through a moth ball, and pin it to the lower corner of your display box. Make sure that the moth ball doesn't touch the bottom of your box if you are using Styrofoam (it will melt). Follow all label precautions when handling moth balls. Freezing your collection overnight on occasion will also work as an alternative to chemical use. Caution: your insects may become brittle after freezing.

Your display needs to be covered with a transparent covering of plastic for display at the fair. Plastic wrap works well for this purpose.

Prepared insect boxes may also be ordered from scientific supply houses. More complex boxes may be built according to fair specifications. These plans are available from Oconto County UWEX.

# Entomology Project

## Fair Display Tips for Insect Collections

Insect displays in Wisconsin are composed of adult insects only, unless the lot specifically calls for immature insects.

The insect project is one of the few fair projects where you can show your collection again and again, simply by adding more insects. It is known as a “continuing collection”. The judge will expect that half of your collection is made up of “new” insects collected during the current project year.

Use the following checklist (with things that the judge will be looking at) to get your insect collection ready for the fair. Try to answer YES in every column!

	Yes	No	Maybe?
Are your insects correctly identified to order?			
Is the common name correct?			
Are your specimens in good condition?			
Do you have any duplicates?			
Are the wings spread properly on butterflies, moths and grasshoppers, etc.?			
Are specimens of uniform height on the pin?			
Are specimens level and straight on the pins?			
Are pins in the correct position for the insect order?			
Are labels neat and accurate ?			
Are labels of uniform height on the pin?			
Are your specimens properly grouped (orders together) and spaced?			
Is your background/mounting surface unobtrusive?			
Is your display covered properly with a protective cover of transparent material?			