

Starting My Insect Collection

OBJECTIVE:

- After completing this activity, participants will:
 - Know how to use a net to collect insects.
 - Know where to look for insects.
 - Understand how to observe insects.
 - Know the basic techniques for creating an insect collection.

LEARNING & LIFE SKILLS:

- Observing
- Gathering and organizing information
- Conducting research
- Increasing fine motor skills (handling fragile items with care)
- Keeping records
- Being patient
- Completing a task

MATERIALS:

- Insect collecting net
- Plastic or glass jar with lid
- Notepad or notebook paper
- Pencil or pen
- "Insect Orders" sheet
- Insect identification book (available from your local library or bookstore)
- "4-H Entomology Labels" sheet
- Freezer
- Large shoebox or wooden insect collection box
- Entomology pins (preferred) or sewing pins
- Styrofoam sheets
- Michigan 4-H Entomology Series (optional)
- 4-H Entomology Record and Report (4H1393; optional)

AUDIENCE:

Ages 9 to 19

TIME:

30 minutes and up

SETTING:

- Collecting activity typically takes place outdoors in a variety of settings
- Insect pinning and display creation typically takes place in an indoor space with tables or desks

BACKGROUND INFORMATION:

You can see two sample insect collections below:



Insect collection in a standard entomology display case (created by Alex Lott of the Haslett Adventurers 4-H Club)



Insect collection in a shoebox (created by Steven Lott of the Haslett Adventurers 4-H Club)

All you really need to start an insect collection is a jar and a net, some pins and a few sheets of Styrofoam.

CAUTION:

Threatened & Endangered Species

Before you begin collecting insects, take some time to become familiar with any threatened or endangered species that may be found in the area in which you're collecting.

The **U.S. Fish and Wildlife**

Service maintains a list of threatened and endangered species at <http://endangered.fws.gov/wildlife.html#Species>. Do not collect any threatened or endangered insect species!

To create a simple insect collection that you could show at your county fair or school science fair, or just to enjoy at home, read and follow the steps outlined in this activity. For more detailed information on collecting, preserving and displaying insects, read the Michigan 4-H Entomology Series. These books were written in the 1980s so their design is somewhat dated, but the information in them is still accurate:

- **Basic Entomology** (4H1335) – This member's manual discusses what insects are, how they live and develop, and how to make an insect collection.
- **Advanced Entomological Techniques** (4H1336) – This member's manual acquaints the reader with unique collecting methods, advanced specimen preparation, specialty collections and ways to interact with other entomologists.
- **Insect Life Cycle Studies Member's Manual 3** (4H1406) – This bulletin is the third in the series. It is designed to introduce 4-H members to rearing live insects and studying insects in their natural environments. The manual helps members observe the behavior of insects, raise insects for profit or fun, or learn about insect life cycles under both artificial and natural conditions.
- **4-H Entomology Leader's Guide** (4H1479) – This bulletin is designed to help 4-H volunteers teach the key concepts covered in the Michigan 4-H entomology manuals. It offers many ideas to help volunteers, including suggestions for group lessons, extra information on techniques, possibilities for field trips and demonstrations, and a list of resources.

The Michigan 4-H Entomology Series can be found in Adobe PDF format on the Michigan 4-H Youth Development Entomology Web page at <http://www.msue.msu.edu/cyf/youth/eoe/entomology.html>

Common places to find insects

Insects inhabit every place on our planet except the ocean. Look for insects in these places:

- Under boards and rocks – Look for ants, crickets, beetles, termites.
- In or around streams, ponds, lakes – Look for mayflies, dragonflies, damselflies, stoneflies, caddisflies, aquatic beetles, true bugs, flies.
- Under loose bark, in logs and stumps – Look for termites, ants and beetles, particularly bark beetles, tiger beetles, wood boring beetles.
- On crops – Look for grasshoppers, beetles, flies, aphids, leafhoppers, spittlebugs, plant bugs.
- In the air – Look for butterflies, moths, flies, bees, wasps, beetles, leafhoppers, grasshoppers.
- In cellars and basements – Look for crickets, beetles, ants, bristletails.
- On livestock, pets, poultry – Look for fleas, sucking lice, chewing lice, flies.
- Around outdoor lights – Look for moths, beetles, true bugs, mosquitoes.
- Around dumps or piles of refuse – Look for cockroaches, earwigs, beetles, flies.
- On manure piles – Look for flies, beetles.
- In, around or on flowers and ornamental plants – Look for thrips, plant bugs, beetles, bees, wasps, ants, aphids, scale insects, walking sticks, insects galls, butterflies, moths.
- In houses – Look for crickets, cockroaches, beetles, ants, flies, mosquitoes, moths, termites, silverfish.
- In clothes, furniture, stored food – Look for clothes moths, carpet beetles, flour beetles, bean weevils.

PROCEDURE:

Collecting & Preserving Insects:

- I. Gather the supplies you'll need for this activity, including an insect net and collecting jar, paper and pencil or pen, entomology or sewing pins, a few sheets



of Styrofoam, a copy of the “Insect Orders” handout, and an insect identification guide.

2. Review the “Common Places to Find Insects” list in the “Background Information” section and decide where you’re going to start searching for insects.
3. Use your insect net to capture one or more insects, then transfer the insects to the collecting jar. Remember to use extra caution if you have caught a stinging insect. Insects that have fragile wings (such as butterflies or moths) or delicate antennae (such as long-horn grasshoppers) should be kept separate from heavy-bodied insects (such as large beetles) to protect their fragile features.
4. Be sure to take notes about your insect finds, including your name, the date and time, and information about where you caught the insect (such as under a log, in a sack of flour or on a stream bank). You may wish to use section I of the **4-H Entomology Record and Report** (4HI 393) to record this information.
5. Use the “**Insect Orders**” sheet or the key on pages 26 and 27 of the **Basic Entomology** manual (4HI 335) to help you decide which order the insect you’re observing belongs to. Record the order in your notebook. Now look in an insect identification book to further narrow down the likely identity of the insect.
6. When you’re done collecting for the day, the insects you have caught must be killed and prepared for pinning. Freezing is an easy way to kill insect specimens and keep their bodies supple until you’re ready to pin them. (Just make sure you have your family’s permission to keep jars of insects in the freezer before you start!)
7. Small-bodied insects should stay in the freezer for several hours and large-bodied insects for two or three days before they’re ready to be pinned. Remove the jar from the freezer and let the specimens thaw for about 15 minutes before you begin to pin them.

Pinning, Labeling & Displaying Insects

1. After the insect specimens have thawed, you’re ready to begin pinning and labeling them. While sewing pins will work to pin insects, entomology pins that are longer and thinner than sewing pins are highly recommended. You can buy entomology pins from college bookstores or science supplies stores.
2. Insects are generally pinned through the thorax (the middle section of the body), slightly to the right of the midline, in the region where the second pair of legs are attached. Pin your specimens at a uniform height on a Styrofoam sheet, with about one third of the pin exposed above the upper surface of the insect. Insects should be horizontal on the pin when viewed from both the front and the side.

See the information on pinning insects in “Preserving Your Insects” on pages 17 to 20 of the **Basic Entomology** (4HI 335) manual for step-by-step instructions. For information on pinning Lepidoptera (butterflies and moths) and Odonata (dragonflies and damselflies), see pages 18 and 19 of the same manual. To properly spread and pin butterflies and moths, you’ll need an insect spreading board, which is described on page 16 of the manual. Step-by-step instructions for making your own spreading board are at **Making a Spreading Board for Pinning Winged Insects**.

3. Use the **4-H Entomology Labels** and the **4-H Entomology Class and Order Labels** to label your collection. Either download the **4-H Entomology Labels** file and fill in on a computer or print the blanks and use black ink and your neatest handwriting to complete them. You can sort your collection in your display box by order, size, quantity, or whether the specimen is beneficial, harmful or immature. Use the order labels to clearly identify each grouping. Take a look at the two sample insect collections, one in a shoebox and one in a wooden display box, for possibilities.

THINKING IT OVER:

When your collection is complete, think about and perhaps write down the answers to these questions:

- Did you have any trouble finding or catching insects?
- Was it easy or hard to use your net to catch insects? What other method could you use to catch insects?
- How might using a specialized net (such as an aquatic or sweep net) instead of a general collecting net improve your collecting ability?
- What part of the insect collecting and display preparation was the easiest for you? The most challenging?
- How can you apply what you learned (for example, about organizing your insect collection) to a new situation?
- What other information do you want to learn about insects and insect collecting?
- Who can you talk to or where can you look for that information?

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Issued in furtherance of MSU Extension work, acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture. Thomas G. Coon, Director, MSU Extension, East Lansing, MI 48824.

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Insect Orders

"Scientific classification" is the system scientists use to describe, categorize and name living things. They use the classification system to help make sure they don't get confused about what plant or animal they're talking about. From broadest to most specific, the groups in scientific classification are kingdom, phylum, class, order, family, genus, species. Entomologists, or scientists who study insects, commonly focus on insect orders when describing groups of insects. The more common insect orders are listed on this sheet. Those listed in bold contain 90 percent of all insects.

The order names are usually combinations of Latin words. This chart gives the order name, the translation of its Latin name, and common examples of insects in the order. For example, *Coleoptera* is translated as "sheath wing," from the Latin word *Coleos*, which means "sheath" and *ptera*, which means "wing." The common name for members of this order is "beetle."

Order Name	Translation	Common Name or Common Examples
Lepidoptera	scale wing	moths, butterflies and skippers
Diptera	two wings	flies
Orthoptera	straight wing	grasshoppers, crickets, katydids, roaches, mantids and walking sticks
Odonata	toothed	dragonflies and damselflies
Coleoptera	sheath wings	beetles
Hemiptera	half wing	true bugs
Homoptera	same wing	aphids, leafhoppers, cicadas, whiteflies, mealybugs and scale insects
Hymenoptera	membrane wings	bees, wasps, sawflies, ants
Dermaptera	skin wing	earwigs
Ephemeroidea (or Ephemeroptera)	lasting but a day (short-lived wings)	mayflies
Mecoptera	long wings	scorpionflies and hangflies
Neuroptera	nerve wing	lacewings, ant lions and dobsonflies
Trichoptera	hair wing	caddisflies
Plecoptera	pleated wings	stoneflies
Thysanura	bristle tail	silverfish and firebrats
Isoptera	equal wing	termites
Mallophaga	wool eating	chewing lice
Anoplura	unarmed tail	sucking lice
Psocoptera	minute wing	book and bark lice
Thysanoptera	bristle wing	thrips
Collembola	glue peg	springtails
Siphonaptera	tube without wings	fleas