Collecting Insects: Entomology Collecting Guide

Adapted from *Behold and See 5* by David Beresford, Ph.D.

Supply List

- 10–20 different insects
- small notebook & pencil
- insect net
- ethyl acetate OR nail-polish remover
- 1–2 wide-mouthed glass jars with lids (to be used as killing jars)
- several cotton balls OR other absorbent material
- a sheet of aluminum foil
- #3 insect pins
- styrofoam board, about 5" x 10" or larger
- utility knife*
- several strips of paper, about ½" x 4"
- sheet of card stock paper to make ½" x 1" labels
- cigar box, shoebox, or a display box from a hobby store

Optional:

- clear envelopes
- small triangular cards, about 1"
- water-soluble white or wood glue OR clear nail polish
- small vials filled with rubbing alcohol (ethanol) for storing soft-bodied insects like caterpillars
- mothballs or naphthalene flakes* to repel carpet beetles
- a small cardboard box, about 2" x 2"

**Use with parental supervision.*

Collecting

Collect a minimum of 10 different insects, ideally about 20. You may wish to choose a theme for your collection, such as butterflies, pond insects, or night-flying insects attracted to light.

Spiders, because they have more than six legs, are not insects. Do not collect them. **Use caution if you collect bees or wasps.**

Carry a small notebook and pencil with you at all times. When you find a specimen, note the date, time of day, location (town and state), and type of habitat. You will be tempted to ignore this advice, but resist this temptation and *always use your notebook*.

Look everywhere! Insects are found in soil, under rocks and bark, in compost piles, abandoned nests, in flowers, weeds, shrubs, and water—both still and running. A very good insect net can be made using either mosquito netting or other material (e.g. "bridal veil") attached to the frame of an old badminton racquet. Some collectors dye their nets green, but I have not found that this helps. Rather, the large dark object seems to scare the insects away, particularly butterflies.

Use your net to sweep across the tops of weeds and flowering plants in parks, fields, gardens, and along fence rows. Even if you cannot see any insects before you sweep your net, you will be surprised that a few sweeps of the net will catch some that you did not see.

There are as many specialized ways to collect as there are entomologists (people who study insects)! For example, you may wish to try sugaring for moths. This involves painting a mixture of beer and molasses onto a tree trunk or fence post during the late afternoon. Then, in the evening or early night, check the trunk for any moths that have arrived. Light traps also work well, as does collecting beetles and moths attracted to outside lights at night.

Killing

The killing fluid used is ethyl acetate, which is the main ingredient in most inexpensive nail-polish removers. (Indeed, I prefer to use nail-polish remover as the killing fluid rather than more expensive chemicals.)

With parental supervision and sufficient ventilation, prepare your killing jar. Place several cotton balls, or other absorbent material, at the bottom of a wide-mouthed glass jar. Pour ethyl acetate into the jar, enough to dampen the cotton balls. Then cover the cotton balls with a layer of aluminum foil so the insects can't hide among the cotton balls. This will make it easier to get the insects out.

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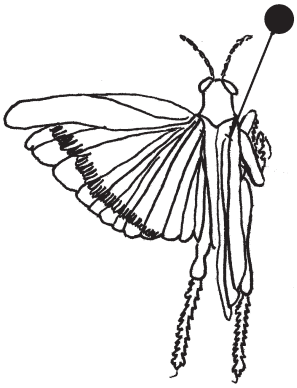
If a substance kills insects, it usually is not good for you to inhale! Clearly label the jar as a killing jar, even though ethyl acetate is not considered highly toxic for humans.

Set the insects you have caught inside the jar, on top of the aluminum foil. Try not to get any fluid on the insect; it will mat scales (if your specimen is a moth or butterfly) or damage some colors.

A separate jar should be used for moths or butterflies to prevent other insects from being covered in their scales. You can immobilize butterflies or dragonflies before killing them by pinching them sharply on the sides of the thorax, or middle part of the insect's body, between your thumb and forefinger. (Do not use this method with moths, as it will only crush them.)

Screw the lid on securely and make sure you keep insects in the killing jar for a few hours after they stop moving. It can be irksome to have an insect "return to life" late at night after being mounted on a spreading board.

Once you are sure the insects are dead, it is time to pin and spread them. Insects killed using ethyl acetate stay relaxed for spreading for about 24 hours, so that is how long you have to complete the steps on the next pages.



Grasshopper with pin placed off center through the right side

Pinning

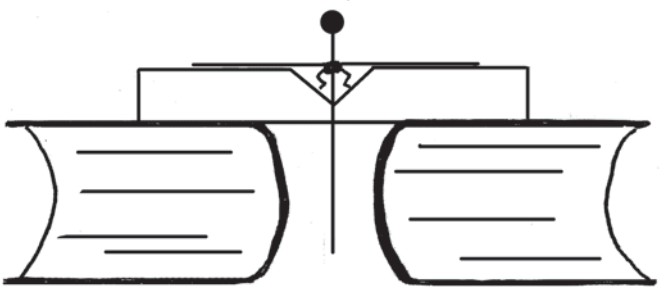
Pinning preserves insects for further study. Ideally, you should get some #3 insect pins for this from an online collecting or biological supply store, because regular straight pins rust and break off. I will assume you have the right kind of insect pins, but if you cannot find pins, then you can glue dried insects to cards the size of postage stamps. (This is how beetles used to be collected.)

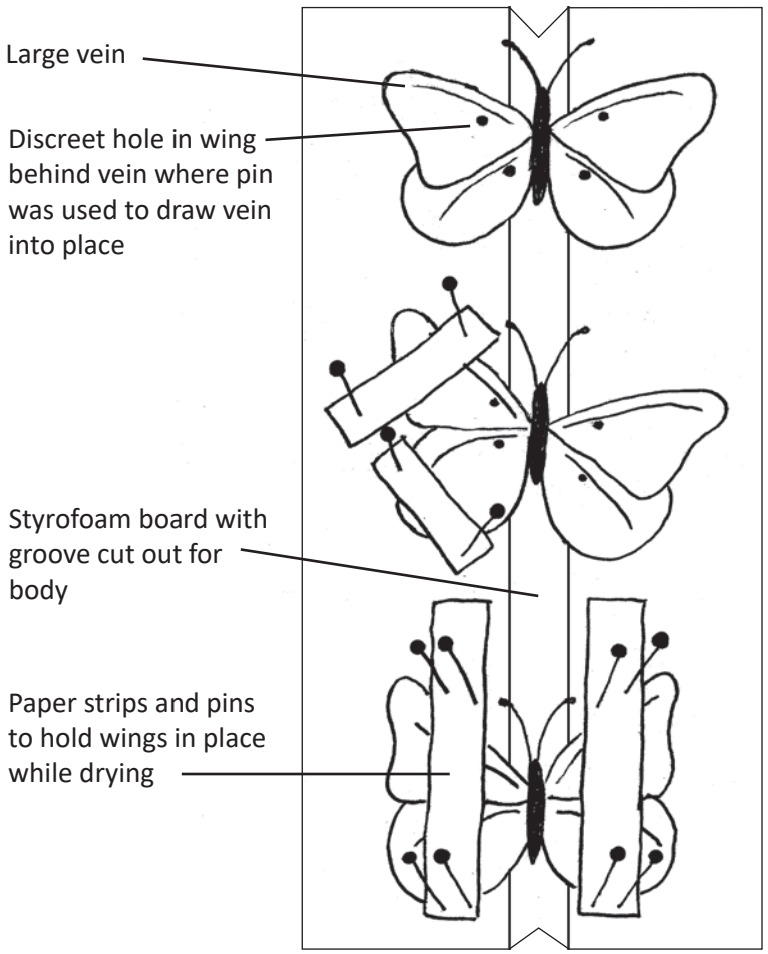
Push the pin through the insect from the top. Pins are placed off center, through the right side, so that the left side at least is undamaged. Many insects are identified by features that occur along the mid-line, or axis of symmetry, so it is important not to damage this area.

The top of the insect should be 1 cm from the head of the pin, with room for identification labels spaced below for easy reading. Obviously, large bodied insects must be placed higher on the pin.

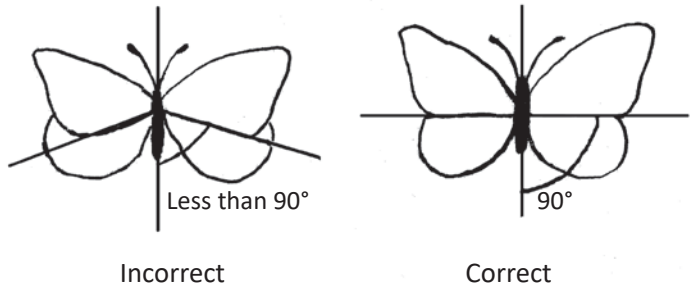
Spreading

After pinning, an insect should be spread—wings and legs and antennae as needed—to appear lifelike, or at least so that features are not obstructed by curled legs. Use a styrofoam board for spreading. With parental supervision, use a utility knife to cut out a groove for the bodies of butterflies and dragonflies so that their wings can be spread out.

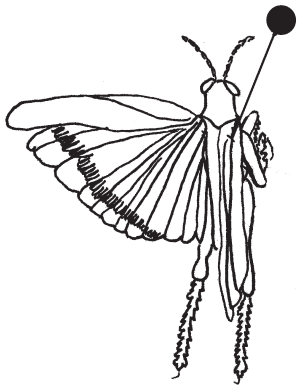




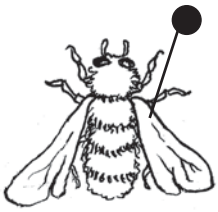
Spreading can be daunting at first, but the process is actually very simple. First, pin the butterfly. Then set it so that the wings are adjacent to the top of the foam board. You can use a pin to draw the wings into position, by inserting a pin directly behind the large vein running parallel with the top edge of the wing. Then, using strips of paper, hold the wings in their final position as they are brought into place.



Butterflies and moths are mounted so that the hind edge of the front wing is perpendicular to the body. Dragonflies and other large winged insects are mounted with the wings perpendicular to the body. (If you would prefer not to pin, these insects can be kept in clear envelopes instead.)

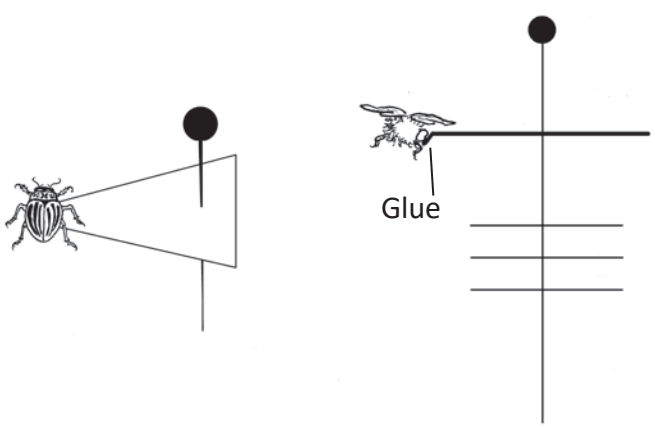


Grasshopper with one wing spread

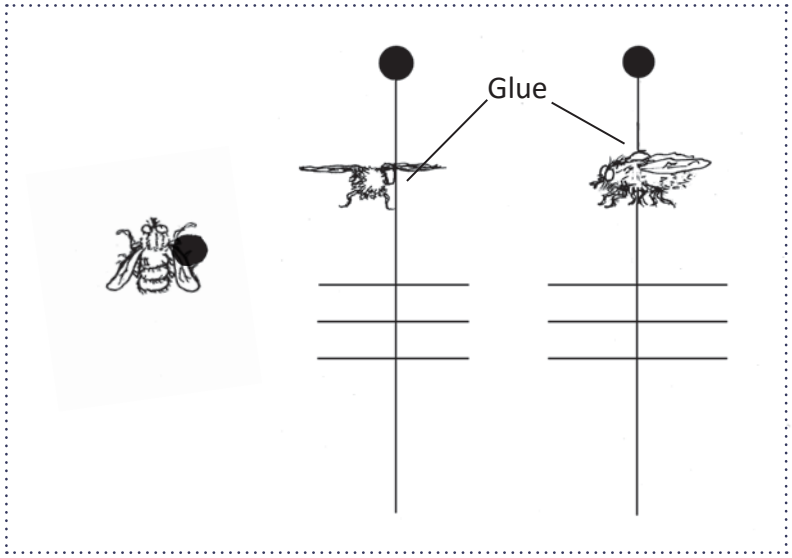


Bee with wings at 45° angles

Wasps and bees are often mounted with wings set at 45° from the body. (This varies; I prefer 90°.) Some grasshoppers are mounted with one side of the wings out and the other closed; it's your choice.



Small insects can be mounted on paper points and glued with white glue to the pointed part of triangular cards. These are then mounted on #3 pins.



Smaller Diptera (flies) can be glued directly to the sides of #3 pins. You may use clear nail polish to glue small insects, or a water-soluble white glue, or wood glue. For all these mounts, keep the pins to one side, ideally the right.

Soft-bodied insects such as caterpillars can be preserved in rubbing alcohol (ethanol) in small vials.

Labels

Labels are simply cardstock cut to standardized sizes, 1.3 cm by 2.5 cm (½ inch by 1 inch) or so. For labels, black ink is the best. Or, you can use pencil. Computer-printed labels are fine.

Three labels are necessary:

Identification label

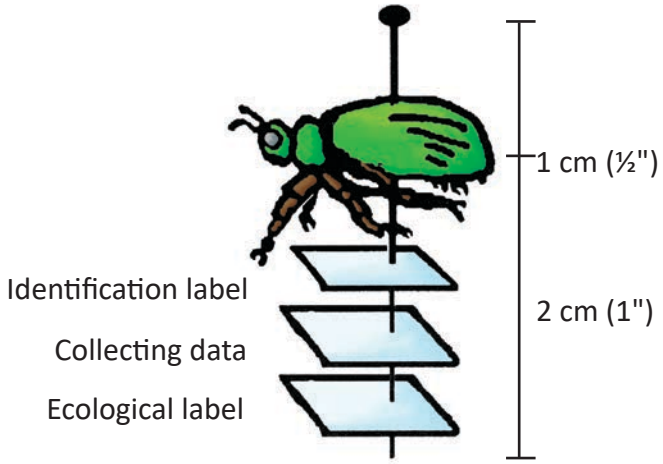
1. The name of the insect
2. Who identified it, if different from the collector. If identified by an app, list the name of the app.

Collecting data

1. Place collected (town and state)
2. Date collected
3. Who collected it

Ecological label

Biological or ecological information of note, such as caught in water, during the day, at night under a light, sweeping in an open field, under bark, etc.



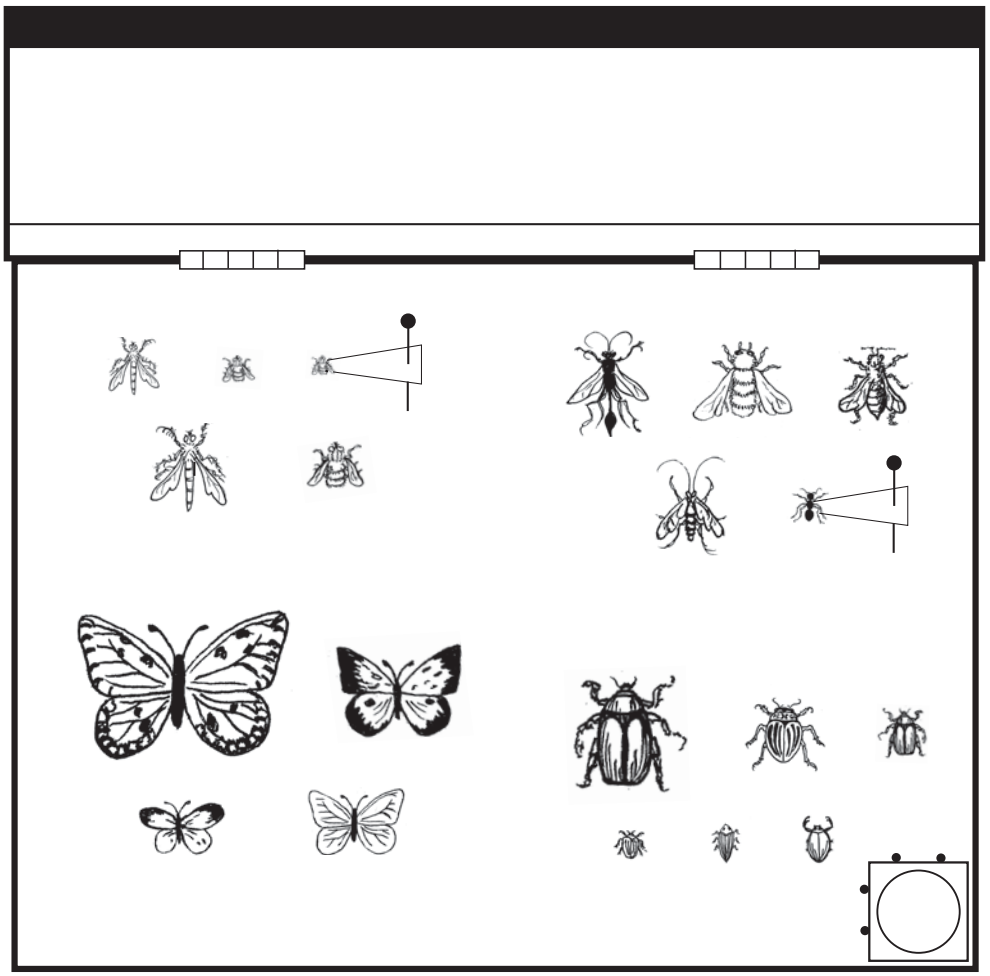
Make sure that labels are at a 90° angle to the pins, with the pins through the center of the labels. Pins should not go through lettering.

For specimens mounted in vials filled with rubbing alcohol (ethanol), penciled labels should be placed directly in the specimen vials. On no account should specimens be number-coded to a separate information page. The whole idea behind labels is that the information is kept *with* the insect.

Displaying & Preserving Your Collection

To display your collection, you can use a cigar box, a shoebox, or better yet, a box from a hobby store used for displaying such things. If you are not using a box from a hobby store, then glue two pieces of cardboard flat onto the bottom of your box to hold the pins in place. Your collection should be scientifically accurate but also aesthetically pleasing. That is, you should carefully place the specimens and labels so that your collection is nice to look at!

Keep your collection dry, cool, and sealed tightly. Carpet beetles, also called dermestid beetles, are everywhere, eating the dried skin and hairs between the cracks of your floor and furniture. These beetles will destroy any collection unless repulsed by mothballs or naphthalene flakes. **Note that mothballs and naphthalene flakes are now considered a health risk, and their use is not recommended any longer.** However, I do not know of any other way to protect insects from being destroyed by dermestids! If you wish to disregard this health warning, make a small cardboard box for the mothballs and keep this in place with pins within the collecting box. Every entomologist does this, but be sure to get your parents' permission.



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Behold and See Science

Firmly grounded in the belief that faith and reason are inseparable, the *Behold and See* science series has been written to teach **up-to-date** scientific knowledge within the context of our **Catholic** faith. Scientifically excellent, these texts allow students to progress rapidly in their understanding of scientific discoveries and the scientific method. More importantly, they gently but compellingly demonstrate God's active and foundational role in creation, and reflect on the proper use of scientific knowledge for the glory of God.

The *Behold and See* series, for **kindergarten to eighth grade**, is distinguished by an emphasis on **conceptual** understanding rather than just memorization of facts. Straight-forward explanations allow students to master concepts as simply and easily as possible, while the series' **hands-on** approach allows students to actually *do* science instead of just reading about it.

Unlike many science books, the *Behold and See* texts are also **homeschool family-friendly**. The abundant activities and experiments are based on materials readily available to the homeschooling family, and the experiment directions are written so that middle-school students can complete them with minimal parental assistance.

"Elizabeth testing *out her lung model from* Behold and See 4 *Respiratory System to see how breathing happens!"*
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