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Welcome to 4-H Entomology



Welcome to the 4-H entomology project area. Entomology (en-toe-mol-o-gee) is from the Greek word **entomo**, meaning insect. Entomology is the science dealing with the study of insects. It will introduce you and your 4-H members to many new and exciting experiences. As well as being fun, it will help you and your club learn about the important and fascinating world of insects. You may even help a 4-H member prepare for a career in entomology. You can help your 4-H'ers to understand the role of insects in world ecology and economy and to discover the different careers related to this field.

How to Use This Manual

This manual offers many ideas to help you as a 4-H entomology leader. These include suggestions for group lessons, extra information on techniques, possibilities for field trips and demonstrations and a list of resources. This guide is designed to help you:

- Understand your role and responsibility as a 4-H leader.
- Develop competency in subject matter knowledge and teaching techniques.
- Know what resources are available to help you.
- Know how to guide youth in project selection, design, development and implementation.
- Involve other adults as potential leaders.
- Learn answers to questions leaders frequently ask.
- Understand beginning and advanced 4-H member skill levels.

The 4-H Entomology Leader's Guide is also designed to help you teach the key concepts covered in the 4-H Entomology Member's Manuals. The chapters of this leader's guide correlate with the topics covered in the following Member's Manuals:

- **Manual 1: Basic Entomology** (4-H 1335)
- **Manual 2: Advanced Entomological Techniques** (4-H 1336)
- **Manual 3: Insect Life Cycle Studies** (4-H 1406)

Before your first club meeting you should become familiar with the 4-H Entomology Leader's Guide and all three Member's Manuals.

4-H Entomology Project Objectives (Core Curriculum)

Like all 4-H projects, the 4-H insect project is designed to help members become self-directing, contributing and productive members of society. While learning about different aspects of the project, young people will also acquire many life skills:

- They develop their **communication** and **organizational** skills by giving demonstrations and speeches, and by learning to exchange ideas.
- They explore **decision-making** and **problem-solving** by learning that alternative solutions to problems do exist.

- They discover how to **cope with change** by evaluating new concepts and thinking about how these concepts can affect them individually and as part of a group and the larger community.

- During all of this, members gain a sense of accomplishment and control, both of which increase their **self-esteem**.

This seemingly “hidden 4-H agenda” ensures that 4-H’ers in an insect project become well-rounded in life skills and their knowledge of insects.

WHAT WILL MEMBERS DO?

By taking part in a 4-H insect project, members will:

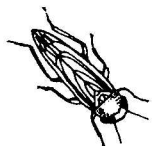
- Discover why insects are important in the world. They will learn about beneficial and harmful insects, and the roles these “bugs” play.
- Develop, and help others develop, a healthy, realistic attitude toward insects (such as discovering that not all insects are bad).
- Recognize the distinguishing characteristics of insects.
- Learn the parts of different types of insects.
- Learn about the growth patterns and developmental stages of insects.
- Learn how to identify and classify insects into orders, families, genera and species.
- Learn about different kinds of collecting methods and equipment.
- Learn different ways to preserve, label, store and display insects.
- Explore different types of insect collections.
- Discover what is involved in rearing different kinds of live insects.
- Learn how to develop and conduct a scientific experiment.
- Learn about existing entomology clubs and organizations.

- Explore the role of pesticides in agriculture, horticulture and home environment, and learn about principles of integrated pest management.

- Learn about the many types of careers related to entomology and the role of amateurs in entomology.

- Integrate their insect project with other project areas such as photography, environmental education, crop and soil sciences, FOLKPATTERNS and animal projects (such as livestock or dog projects).

- Explore many life skills including health and safety, leadership, self-evaluation and reference skills (knowing how to consult other sources of information), as well as those “hidden” skills listed previously.



Role of the Leader

As a 4-H insect project leader you should have an interest in both insects and young people. Your goal should be to help your 4-H'ers fulfill as many of the objectives listed on page 2 as possible. The satisfaction of seeing members increase their knowledge of insects and benefits from the other components of a well-rounded project will be immeasurable!

As the 4-H leader you are the key person in your club. The success or failure of your entomology program depends a great deal on your interest and initiative, but the whole load should not rest on your shoulders. Your job is to help your club members plan and carry out a program based on their needs, interests and abilities. That's a big job, of course!

One of the first things to realize is that you don't have to be an entomology expert to be a good 4-H entomology leader. If you're able

to create learning opportunities and find information and answers when needed, then you're all set. You'll learn the rest right along with your 4-H members!

There are many sources of help in connection with your entomology program. Your county Cooperative Extension Service staff can provide you with publications, training aids and other assistance as needed. They have access to all the resources of Michigan State University and the United States Department of Agriculture. For additional sources, refer to the **Resources** section near the end of this guide.

Your role as an entomology leader will vary depending on the age and experience level of your 4-H'ers. Your greatest asset is your own ingenuity. You are not expected to know everything, and help is available.

LEADER OPPORTUNITIES

There are other opportunities for you to consider as a 4-H leader. Each year there are workshops for leaders in your county or region where you can learn from experts and share ideas and experiences with other leaders. Through these workshops you can improve your knowledge of insects and also learn ways to enhance your leadership skills. The 4-H program focuses on expanding the life skills of leaders as well as members. Check with your county Cooperative Extension Service office for dates and locations.

Another opportunity available is serving on the State 4-H Natural Resources and Environmental Education Developmental Committee. This committee sets the focus and goals of the entomology project for the whole state. For more information on how you can get involved, contact your county Extension staff.



Working With Youth

WHAT DO THEY WANT TO LEARN? WHAT DO YOU WANT TO TEACH?

Many times people think of 4-H entomology as only the collecting of insects for fair exhibition. It is in fact much broader than that! There are numerous opportunities for young people to learn things about entomological science other than collecting, and to develop other entomological skills. (See **Appendix A** for suggested fairbook guidelines to get an idea of what other opportunities might be available for fair exhibiting.)

Another thing to keep in mind is that not all the activities or learning experiences you do with your 4-H'ers need to lead to a fair project. As 4-H leader you are encouraged to get your members involved in fun and valuable learning experiences that may not turn into projects for the fair. For instance, an observation study of live insects in their natural environment can

be a fun and valuable learning experience for your club members. (More information on conducting observation studies can be found in **Member's Manual 3: Insect Life Cycle Studies**, 4-H 1406.)

When working with 4-H'ers you are encouraged to:

- Offer experiences to each child according to his or her needs, interests, abilities and goals.
- Help young people build creativity, confidence and positive values.
- Appreciate the natural expression of each child.
- Refrain from imposing adult standards on children and their entomology projects.
- Provide recognition for project or personal development.

SPECIAL NEEDS AND CONSIDERATIONS

One of the first things you'll want to consider is the age, experience level and size of your group. Keep in mind that attention span, comprehension level and hand-eye coordination is going to vary greatly between children of different age groups.

Working with 5- to 8-year-olds

Kids in the 5- to 8-year-old age group have a natural curiosity about everything. For this reason they are at an ideal stage for learning about the insect world!

You should have a variety of action experiences planned for your 5- to 8-year-old 4-H members. Don't expect to hold their attention for longer than 10 minutes at a time while providing instruction or other information. Experts advise that there be one adult or teen helper for every six children.

Some activities you may wish to do when working with this age group include:

- Creating insect models using materials like pipe cleaners and bottlecaps.
- Making insect puppets.
- Putting together a scrapbook about insects. (You may want to use themes such as what do they look like or where do they live.)
- Learning about butterfly gardens and plants.
- Exploring insect terraria and zoos.
- Taking a field trip to look and listen for insects.
- Identifying recorded insect sounds and songs.
- Doing block printing (an older youth or adult would need to do the carving).
- Making stencils (insect cut-outs).
- Making jigsaw puzzles (cut up a picture of an insect and put it back together).
- Learning songs, plays, skits or stories made up about insects.
- Playing board games, card games or insect bingo.

4-H Kaleidoscope: Just Outside the Door materials are available for working with 5- to 8-year-olds in entomology. Contact your county Cooperative Extension Service staff for more information.

Working with pre- and early adolescents

Children in this age group desire independence, yet they want and need direction from adults. To provide balance between these two opposing needs, a 4-H leader can encourage members to get assistance from teen leaders, other adult leaders, parents and peers. Another characteristic of this age group is a desire for group activity, so you might have members work in small groups. With the younger members of this age group (9- to 12-year-olds) you may find it best to separate boys and girls for project work, since 9- to 12-year-olds tend to prefer being with members of their own sex.

4-H leaders working with pre- and early adolescents should also try to outline directions in detail. Make record-keeping as simple as possible and ask for short narrative reports that will prompt members to review what they have learned.

Working with older or experienced members

Aside from a standard insect collection, most entomology projects are self-determined and allow 4-H'ers to select, plan, develop, carry out and evaluate a project of their own choosing. Older teenagers want and need the opportunity to do things for themselves. At the same time, they want and need ideas, suggestions and friendly, caring involvement from adults. Under your guidance, teens will decide on a goal they want to attain. They'll decide on activities to help them meet their goals and will carry out those activities. Members will keep records of their progress and evaluate their project when it's finished.

By participating in self-determined projects, 4-H'ers learn important skills that they'll use throughout their lives. (Life can easily be viewed as a self-determined project!) Through planning and carrying out a self-determined project, 4-H'ers will learn many important skills, such as:

- Setting clear and achievable goals.
- Making choices and decisions among available options.
- Planning how to meet established goals.
- Using community resources.
- Setting realistic timetables.
- Assuming responsibility for their own learning.
- Evaluating their progress toward meeting their goals.

Remember, these skills are what 4-H is all about, regardless of the 4-H project!

Whether you're working with individual 4-H'ers or with groups, you'll need to schedule planning meetings to get older 4-H'ers started on their projects. The suggested meeting activities listed throughout this guide should help you come up with project ideas for older or more experienced 4-H entomology members.

Once the 4-H'ers have decided what they want to do for their specific projects, you'll be "on the sidelines" as a coach. You can offer the members occasional advice, direction, support and encouragement as teens test their abilities to plan and carry out their projects.

Working with new members

Be sure to keep in mind the characteristics of their age group when bringing new members into a 4-H club. After initial introductions you may want to plan a group activity to get the new member into the mainstream of the club. You also might consider asking one of the other members to serve as a "buddy" for a new member until everyone is comfortable and familiar with each other.



Teaching Techniques

Following are some helpful teaching techniques to use in your 4-H Entomology club.

DEMONSTRATIONS AND SPEAKERS

Demonstrations by members and speeches by guest speakers are very effective teaching techniques for the entomology area. Encourage your members to give at least one demonstration during the year to their club members or to other groups. These can be simple, informal demonstrations which will get the group members more actively involved in learning. You can also invite parents and other resource people to demonstrate or speak about specific topics.

Topics for demonstrations or speeches can include insect habitats, collecting techniques, preserving and mounting, insect identification, insect rearing, beekeeping and careers in entomology. Other topics are included in the activity suggestions for the different meetings. The list of possibilities is endless!

FIELD TRIPS

A field trip is an excellent club activity. It's a good way to provide 4-H'ers with necessary hands-on experience and to expand their knowledge and interest in entomology. A trip requires some planning, and you may want to discuss possibilities with the group at one of the first meetings. This will allow time for planning and making arrangements. At the meeting prior to the field trip, ask your members what they would most like to do, see or learn. You can then assist your 4-H'ers in planning the activities so that the interests they mentioned are included.

Following are some ideas for field trips:

- Take a collecting trip in your backyard or neighborhood to see what types of insects live there.
- Take a collecting trip to a few different types of habitats or explore insect habitats during different seasons or at night. (Later compare how the insects of each habitat or season were different and similar.)
- Take a cocoon collecting trip in the winter and watch the cocoons hatch in the spring.

- Take a trip to a university, science museum or insect zoo with a large insect collection. Arrange to have the group take a look "behind the scenes" so they can see how the museum maintains and expands its collection.
- Visit a university entomology department for a firsthand view of current entomological concerns and research. Explore possible career opportunities in entomology.
- Tour a beekeeping farm and see how honey is made.
- Visit a pesticide research center or a pest control company and explore how insect pests can be controlled.

If you are taking your club collecting, here are a few things that you should have for a successful trip.

- Collecting jars—at least one killing jar and two containers for live stock.
- A net (if you have one; it's not absolutely necessary).
- Mosquito repellent.
- A container of drinking water.
- First-aid kit containing at least a couple of adhesive bandages.

- Food (a snack for midafternoon, or lunch if you will be out during the noon or evening meal).
 - A pack or cloth bag with shoulder or belt straps to carry equipment.
 - Proper clothing, such as a hat to shade your eyes, comfortable shoes, old clothes (slacks or jeans to protect you from berry bushes) and a jacket or raincoat, depending on the weather.
 - Paper or plastic bags for collecting host plant specimens.
- When you go collecting, make sure you

know where you are going and how to get back before you leave the starting point. Anyone, even someone experienced in navigating in the wilderness, can get lost. The trick is to find your way before you hike an extra hour or two. So look at a map and carry a compass, especially if you are going into hilly or wooded areas.

Also, know what the dangers are, such as poison ivy, snakes and poisonous spiders. If there are any in the area, learn how to recognize and avoid them, and know what to do if you encounter them.

CAREERS AND HOBBY EXPLORATION

There are many careers in the entomology field and even more ways to be involved as an amateur. Thousands of people have exciting, creative jobs that involve collecting, identifying, rearing, controlling and researching insects. As part of your group's experience, encourage members to research some of the careers. Take your club on a field trip to a museum, university or other facility. Your members could plan to ask questions about careers and the types of training needed for those careers.

Older 4-H'ers interested in entomology careers should contact their county Extension office to explore possible summer jobs or internships with either the county or Michigan State University.

For sources of information on entomology careers, have your members check the local library. You could also contact the 4-H entomology Extension specialist. A free career brochure can be requested from the Entomological Society of America (ESA). Refer to the **Resources** section of this guide for the ESA address.

Members who do not want to be professional entomologists can be actively involved as amateurs. They can join the Young Entomologists' Society (YES) or the Michigan Entomological Society (MES). (Refer to the **Resources** section of this guide for the addresses of these organizations.) Entomology can be a lifetime hobby that provides fun while traveling, activities for the entire family,

decorations for the home, topics for conversation and much more! Knowledge of insects can help you in making pest management decisions in your home, work place and on public policy issues. You may also be able to contribute to science.

Another way to gather career and hobby information is to ask someone active in entomology to speak at one of your meetings. To begin finding people from your area, contact your county Extension agriculture agent, the Michigan Entomological Society, the Young Entomologists' Society or look in the yellow pages under pest control services. Your members could prepare questions for the guest speaker before the meeting.



Planning and Conducting Your Club Program

There are a number of things to consider when making choices and plans about how to conduct your club program. For each club meeting and activity you should consider where it will be held, how much time it will take (including preparation, activity and clean-up time), what materials are needed and how they will be provided. You may also need to consider which season of the year is most appropriate for each activity.

This leader's guide provides a number of club meeting activities that relate to the concepts covered in the 4-H entomology member's manuals. These activities are discussed

in the order they appear in the member's manuals. However, they do not necessarily need to be done in that order. Additional activity suggestions not related to any particular sections of the member's manuals are listed in this guide under **Innovative Projects and Activities** (see page 21). You may wish to consult these ideas occasionally to plan them in between, along with, or instead of other meeting activities. Also, don't forget to ask the 4-H members and their parents for input. They'll have a wealth of ideas!

MEETINGS

Holding your meetings in a home—yours or a member's—is probably the most convenient for you. Space may be a factor to keep in mind depending on the type of meeting activity. A school, church or community center may also

make its facilities available. Or, if you're having a collecting trip, you may wish to simply gather in an open field or a local park! You should do this planning in advance.

TEEN LEADERS AS A RESOURCE

One excellent resource you shouldn't overlook is the older, more experienced club members! By actively involving teen leaders in your 4-H club you can satisfy their desire for adult leadership opportunities and provide assistance for yourself in working with the rest of the club. Teen leaders can serve as good role models for younger 4-H'ers.

To help your teen leaders to be effective, they should be 3 to 4 years older and consistently more mature than the 4-H members with whom they are working. (Otherwise their leadership could be rejected by the other members.)

APPROVAL OF PROJECT PLANS

One of the advantages of 4-H is that the 4-H leader and club have the flexibility to choose their own activities to best meet the needs of the group members. However, as you work

with your 4-H club, be sure that your materials and activities relate to the 4-H entomology project curriculum listed at the beginning of this guide.

PARENTAL INVOLVEMENT

Don't forget that parents are an important part of the 4-H family! Be sure to invite them to meetings and seek their involvement and support of club activities. Parents can also

help their children maintain accurate and up-to-date records. A useful aid for record-keeping is the **4-H Entomology Record and Report** (4-H 1393).

