

Title: BUGS ABOUT INSECTS

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Environmental Education Team

Grade Level: 5-8

Concepts:
2. Ecosystem
3. Carrying Capacity
10. Economic Gains

Disciplines:
1. Science

Objective:

Students will discover some of the great variation in insects by collecting and observing insects residing in major habitat types.

Students will use various methods for collecting insects which will expose for them habitats in which insects live.

Students will note variation in detail within the common body plan for insects by describing different insects of interest.

Rationale:

Insects comprise over one half the kinds of living things found on earth. They are the dominant species in every habitat but salt water. Man's existence is profoundly affected by insects: mosquitoes, fleas, lice, etc., feed directly on man, which has spread the plague, typhus, malaria and yellow fever over the ages.

Insects compete with man for food by eating his crops. Most insects don't concern man at all and many are helpful. They produce honey, pollinate crops, produce silk to name a few benefits.

Materials Needed:

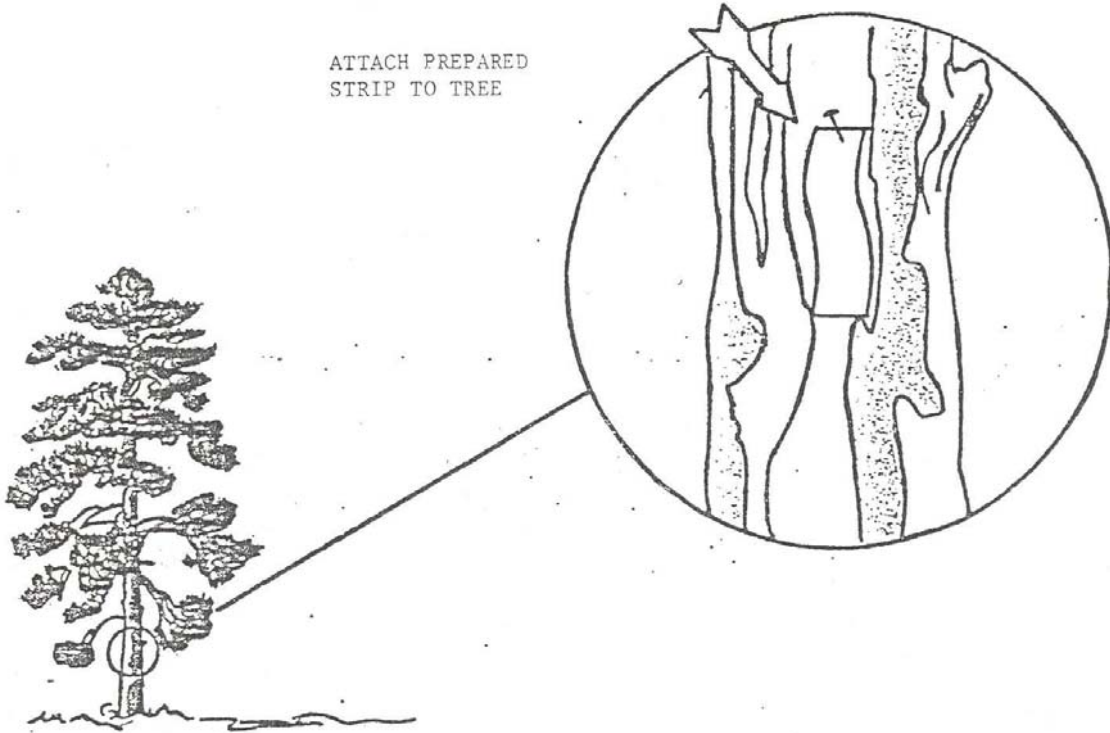
Collecting jars, sweep nets, beating sheet, insect sieve, pinning materials; aquatic nets, identification books, (Peterson Guide to Insects, Peterson Guide to Butterflies, How to Know the Insects, How to Know the Immature Insects, How to Know the Beetles, How to Know the Grasshoppers, Pond Life Golden Guides, Golden Guide to Butterflies and Moths, plus several books on insect natural history), clipboards, can traps, trowels, white enamel pans, hand lens. Copies of study sheet, pencils, bait (sugar syrup or molasses, bits of meat.)

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STRIP OF COTTON FABRIC SOAKED IN
SYRUP MOLASSES MIXTURE

ATTACH PREPARED
STRIP TO TREE



INSECT GRABBER

Purpose: To attract and catch a variety of insects for observation.

Materials: Strips of cloth, tack, different baits.

Procedure: 1. Cut several strips of cloth from an old sheet.

2. Dip these strips into different baits. such as syrup, sugar
Water, molasses mixture, or honey. Also try smearing jelly
or other such substances into cloth.

3. Tack these strips to various trees in an area which you are
sampling. Try placing them in a bush, beside a stream, by a
light bulb at night, or over water.

E.T.
BUGS ABOUT INSECTS

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INSECT NET

WOOD SHOOT TO
MAKE HOOP

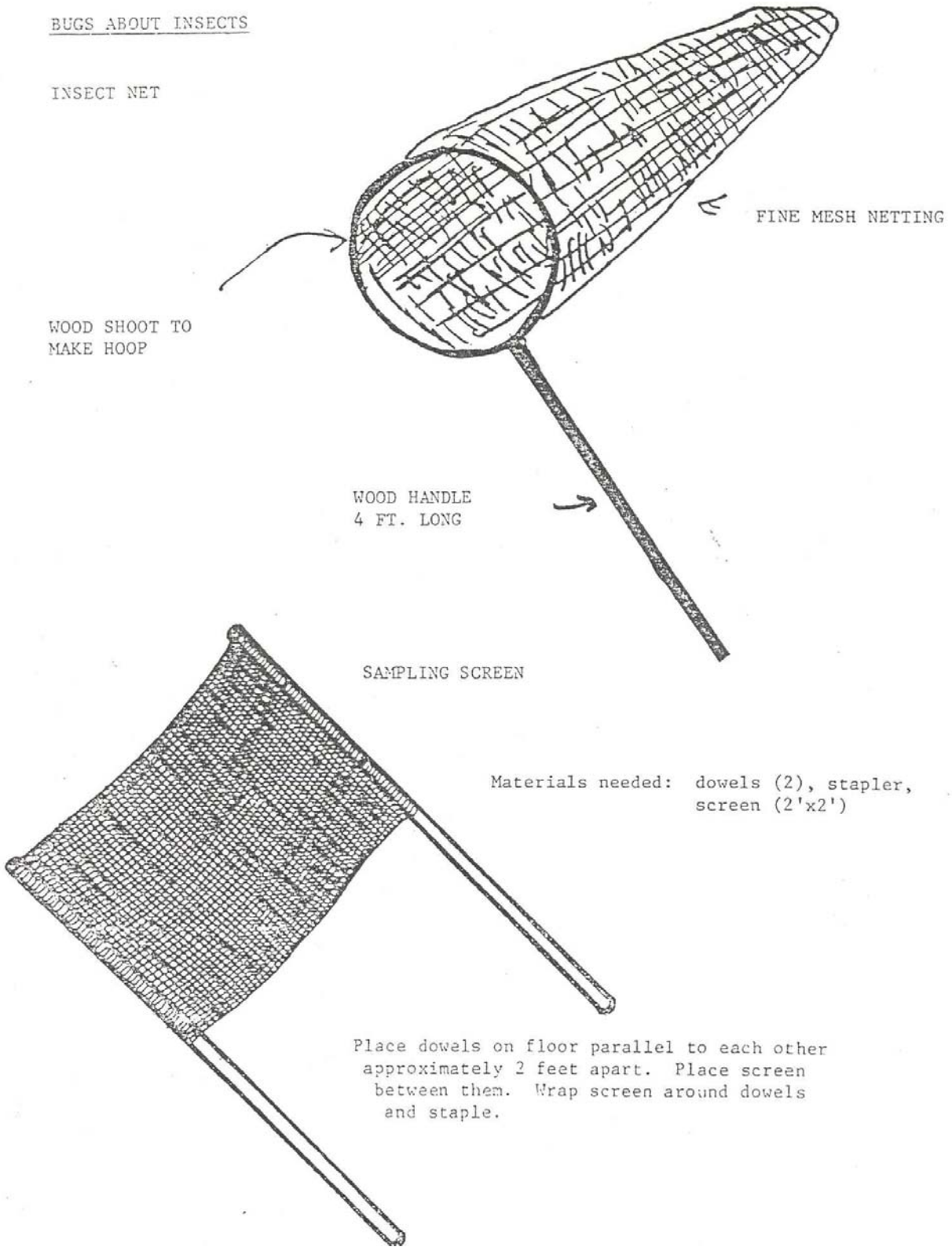
WOOD HANDLE
4 FT. LONG

FINE MESH NETTING

SAMPLING SCREEN

Materials needed: dowels (2), stapler,
screen (2'x2')

Place dowels on floor parallel to each other
approximately 2 feet apart. Place screen
between them. Wrap screen around dowels
and staple.



E.T.

BUGS ABOUT INSECTS

Background Information to Teachers:

There are more than one million species of insects on earth occupying most habitat areas except the open ocean. All are members of local food chains and significant food sources to various predatory animal forms. Many are directly beneficial to man such as the bees and butterflies which pollinate many crops.

Some insects are harmful to man, mostly because man has set up ideal habitat conditions for their needs or has destroyed natural predators. Some are highly irritating to us, however, they fit into natural food chains; like mosquitoes which are an important food to birds and lizards. Some are carriers of disease such as dengue fever, intestinal parasites, etc. The elm bark beetle carries the Dutch elm disease which has killed many trees in the United States.

Most insects are neutral to man's interest but play some key role in the living community in which each resides. Each has a niche or place in the community. We should learn more about insects, their variety and their ecological function. We must learn to respect their place in the environment and learn the most ecologically sound way to reduce the impact of those insects seriously harmful to man.

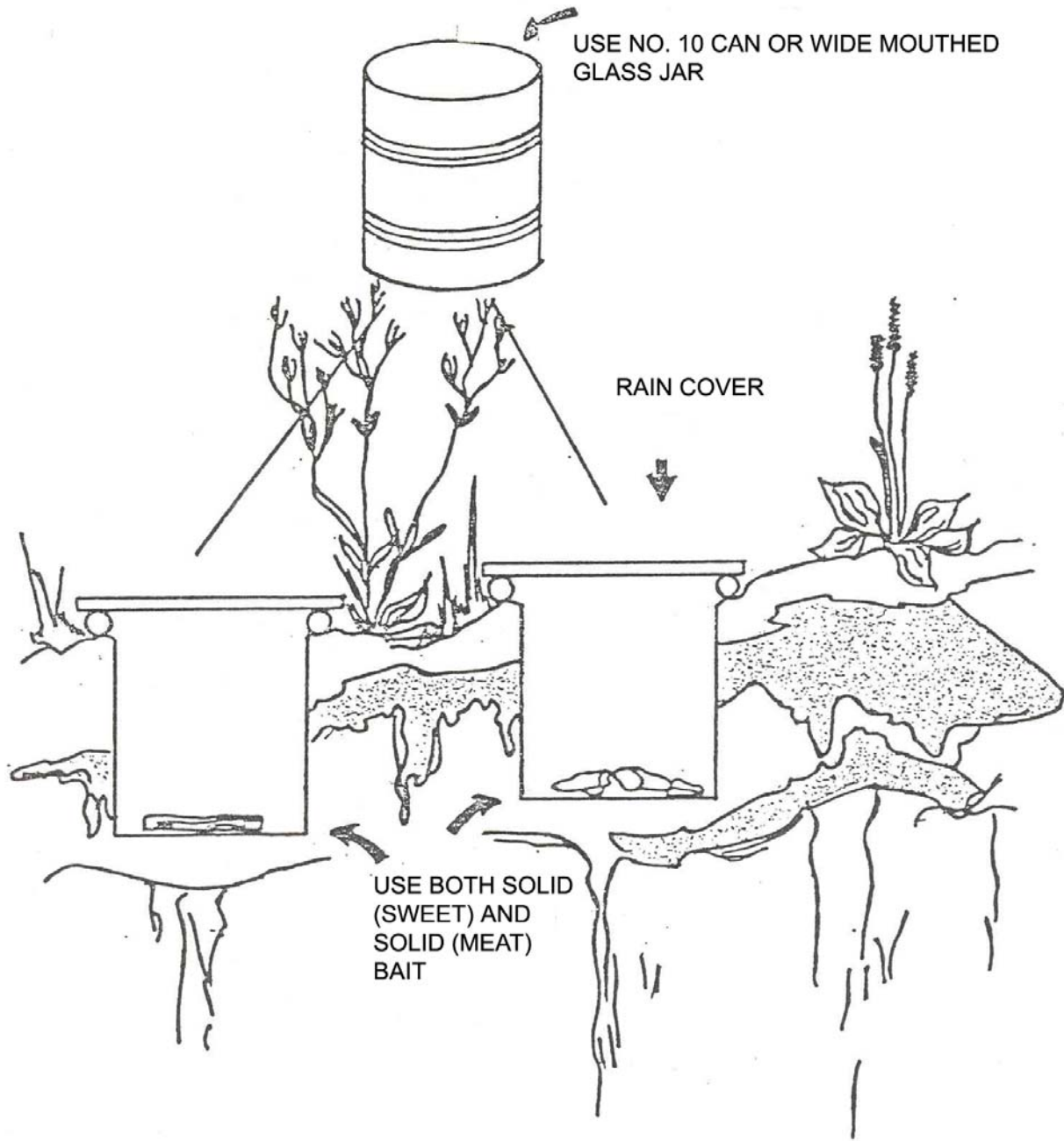
Directions/Activity:

Permit students to find as many insect types as possible. Demand that insects be released except those you wish to kill and take back to the classroom for mounting.

Insects may be killed at the laboratory by using a few crystals of moth balls or ice in the cotton filled sections of the collecting jars.

Bees pollinating flowers usually do not sting unless greatly disturbed. Nevertheless, request that students use caution. Keep allergic children away from areas where bees are active.

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INSECT TRAP

Materials: No. 10 can or wide-mouth glass jar, scrap wood, bait.

- Procedure:**
1. Dig a hole to accommodate can or jar
 2. Set container in hole so that the mouth is flush with the soil.
 3. Bait trap with either a solid sweet bait such as a candy bar or sugar cube, or a solid meat bait
 4. Place a scrap piece of wood over trap to protect from rain and keep small mammals out. Raise lid slightly with supports on two ends so that beetles can reach the trap.
 5. Check trap occasionally, removing trapped insects.

E.T.

BUGS AROUND INSECTS

I. Pre-Trip Activities:

- A. Make drawings of the basic body plan of an insect.
- B. Learn about eight important groups of insects (orders).
- C. How many legs do insects have, how many wings?
- D. List the different types of insects of which you can think.
- E. How do insects help man?
- F. What insects are harmful to man?
- G. What insects are neutral to man normally?
- H. What do insects eat?
- I. What can you find out about insect life styles?
- J. What are "grubs", larvae, pupae, cocoons?
- K. Investigate the world of social insects such as bees and ants.

II. Field Activity:

Team Organization: Students should be organized into teams-of three. One net and one catching jar will be assigned to each team, also one clipboard and field sheet and five tin cans, bait, and one hand trowel.

E .T.

Name_____

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STUDY GUIDE

A. Insect Trapline

Teams ,will set out five tin can traps ,with a small amount of bait in each can. Locate the traps in different habitats. With a trowel dig a hole, set the baited can in the ground so that the top is level with the ground and leave the trap until later.

If staying overnight, set traps in the evening. If coming for all day, set traps early in the day and collect them before leaving.

Set traps in woods, in rotten wood or stump, under bushes, in the open field. Note the following information when you collect the trap.

CAN #1 Habitat_____

Number of insects in the can_____

Number of insect types in can_____

Describe one insect_____

CAN #2 Habitat_____

Number of insects in the can_____

Number of insect types in can_____

Describe one insect_____

CAN #3 Habitat_____

Number of insects in the can_____

Number of insect types in can_____

Describe one insect_____

CAN #4 Habitat_____

Number of insects in the can_____

Number of insect types in can_____

Describe one insect_____

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CAN #5 Habitat_____

Number of insects in the can_____

Number of insect types in can_____

Describe one insect_____

Count the total number and types of each insect. Select one of each type and place in collecting jar. Release all other insects. Take collecting jar to your teacher to show the variety you have found. The teacher may select insects for mounting in the laboratory or classroom.

B. Each team will use the "sweep net" to catch insects on and around the vegetation. Do not chase after butterflies. Watch for sitting insects and sneak up on them with the net. Use the net properly by sweeping it through the grass. Have the instructor demonstrate the proper use of a sweep net. Protect the net from damage by sharp twigs, etc.

1. Meadow Habitat

For five minutes, "sweep" the net through the grass and around flowering plants. Be careful of bees, wasps, etc. You may select one insect of each type to place in the collecting jar. Count the number of insects of each type captured. Release all other insects.

- | | | |
|-----------------|--------------------|----------------------------|
| _____Bees | _____Butterflies | _____Dragonflies |
| _____Mosquitoes | _____Jack Spaniard | _____Beetles |
| _____Flies | _____Leaf Hoppers | _____Grasshoppers |
| _____Crickets | _____Moths | _____Other |
| _____Lace Wings | _____Other | _____True Bugs (Hemiptera) |

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2. Brush and Wood Habitat

Go to a brushy wooded area and again "sweep" the vegetation for a short time. Count the number of insects of each type.

Select one of each type to place in the collecting jar and release all others. Be careful not to damage the net.

- Bees Butterflies Dragonflies
- Mosquitoes Jack Spaniard Beetles
- Flies Leaf Hoppers Grasshoppers
- Crickets Moths Other
- Lace Wings Other True Bugs (Hemiptera)

3. Waterbugging

DO NOT USE WEEP NETS IN WATER

Use an aquatic dip net at the edge of a pond. Collect samples of aquatic insects and insect larvae. Note the kinds of insects found. Insects have six legs. Larvae may have six legs or may not have apparent legs. You will find animals which are not insects. Stay alert. Sample insects may be kept in water in the enamel pans. Release all other back into the water.

- Dragonflies Water Striders
- Dragonfly Larvae Giant Water Bug
- Springtails Back Swimmers
- Water Boatmen Mosquito Larvae

D. Beating About the Bush

Using the beating net, one team may place the white sheet under a bush or low tree and beat the leaves with sticks. Insects will fall into the white sheet. They should be quickly picked from the sheet and placed in the collecting jar. Release all but one of each type.

Number of types of insects _____

Describe carefully two insects you have found in this exercise

#1 _____

#2 _____

E. Bugs in the Woodwork

Option: The teacher may wish to use the exercise Nature's Recycling System for a more complete study of wood decomposing animals.

In an area where old logs and stumps are on the ground, probe with your trowel for examples of different types of wood rotting insects and their larvae. Stay alert. You will find many non-insect animals.

How many types of animals did you find? _____

Describe two insects found in this exercise.

#1 _____

#2 _____

F. Dirt Bugs

One team will use a trowel or small shovel to search for insects inhabiting the soil. From a likely area dig soil down about 3-4 inches. Sift it through the insect sieve, identify and count the insects of each different type. Try a grassy area, pond edge, soil at the edge of the rain forest, and a place where there is leaf litter. Place one insect of each type in the collecting jar. Release all others.

Habitats Sampled _____

Number or insect types found _____

Describe two insect types

1 _____

#2 _____

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G. Counting Up

Turn your collection over to the teacher. Teams will check each collecting jar to view the variety of insect types collected. Try to determine how many kinds of insects were found today.

Number of insect types found _____

The teacher may select insects to be taken back to the classroom. If they must be killed for mounting, use moth balls as a killing agent.

If there is time, students may mount killed insects by pinning them and placing them on a spreading board. This is a good exercise for a small number of students.

Students may more carefully observe collected insects in the classroom using a hand lens, microscopes, and insect books.

H. Habitat Review

Discuss back in class.

Pond

1. Why do some insects live within certain areas of a pond?
2. Are some insects found in all areas of a pond?
3. What are jobs or functions of insects in a pond community?
4. Are the pond insects dependent on each other?
5. Why are some insects in a pond more numerous than others?

Meadow

1. Why do certain insects live in certain areas of the meadow?
2. What attracts bees to the meadow?
3. What are the jobs or functions of the meadow insects?
4. How does the false coffee insect gall complete its life cycle?
5. Which insects are most numerous in the meadow and why?

Forest

1. Are the insects of the forest and meadow all the same?
2. Does the forest cover provide more protection than the meadow?
3. What is the primary job of the wood dwelling insects?
4. Are there more poor flyers in the woods than in the meadow?

Soil

1. How are the insects different from those in the meadow and forest?
2. What do insects do in the soil community?
3. Why would you find more insects in one soil type than another?

III. Post Trip Activities:

1. Investigate the ecological role of insects. Build food chains involving insects in the wild.
2. Investigate how agriculture has created good breeding conditions for pest insects.
3. Find out about natural methods of insect control.
4. Investigate pesticide safety for farm operators.
5. Mount and exhibit the variety of insects collected during your field studies.
6. Read a book about insects and their habits.
7. Invite an entomologist from USDA to talk to the class.