



Insects Pre-visit

Classroom Activities

Brief Synopsis

Insects are the most successful animal life on earth. The wide variety of insects makes it possible for them to live in all kinds of habitats. Students will complete a worksheet and discussion about different tools used for insect collection in different habitats. For an extension, the students will study the eight most common insect Orders as a way to prepare to play a memory-style game to match up the Order descriptions with their pictures.

Ages: Designed for 5th–8th grade

Time Considerations: 20 min. and 45 min.

Materials:

- Copies of worksheets
- Pencils
- Scissors for extension activity
- Glue (optional)
- Cardstock (optional)



Vocabulary: Classification, Habitat, Identification, Order, Taxonomy.

Outcomes:

1. Students will be able to match the appropriate tool for collecting insects in various habitats.
2. Students will understand how insects are organized into taxonomic groups.
3. Students will be able to name the eight most common insect Orders in Minnesota.
4. Students will be able to recognize which Order an insect belongs to by its picture.

Minnesota Academic Standards:

Science: 4.IV.B.1, 7.IV.B.2, 4&5, 7.IV.C.4, 7.IV.E.3-5

Math: 4.V.B.1

Language Arts: 4.I.A.1, 4.I.B.1&2, 4.III.A.1&2, 5.I.A.1, 5.I.B.1, 5.III.A.1&2, 6.I.B.4, 6.III.A.1&3, 7.I.A.1, 7.I.B.1&5, 7.III.A.1, 8.I.B.1, 5&8, 8.III.1, 2&7, 9-12.I.B.4

Revised Mar 2007

Set-up

To conduct the first activity you will need to photocopy the attached **worksheet**, one for each student, and have a **pencil** available for each student. For the second activity, you will need to photocopy the attached **game sheet**, one for each 2-3 students and have **scissors** available for each small group. An additional option is to have your students **glue** the cards on to **cardstock** to make them more sturdy.

Activity 1: Insect Habitats

Background: Insects are everywhere! They can be found in all kinds of habitats all over the world. Some scientists believe that there are a many as 10 million different kinds of insects in the world, most of which haven't been identified yet.

Each of these different kinds of insects can be found in nearly any habitat type in Minnesota. In order to capture them and identify which Order each insect belongs to, it is important to use the correct collecting tools for each setting.

Procedures:

1. Hand out the *Collecting Tool and Habitat* worksheet to each student.
2. Have them take their time to decide which collecting tool would be best for each habitat.
3. Explain that they should be able to defend their answers as to why each tool would be best for each habitat.
4. When all students have had enough time, have the class share their answers in a discussion. Include the following questions:
 - Which tool and habitat would they most like to use?
 - Which one do they think would catch the most insects or the highest diversity (variety) of insects?
5. Assess your students' abilities
 - Do your students give good reasons for using each tool at a different habitat?
 - Would any of the tools be useful at more than one habitat?

Activity 2: Insect Orders

Background: An important way of knowing how many kinds of insects there are in the world is to have a system to group them together by how similar, or closely-related they are. This is called taxonomy or classification. All living things are first grouped into Kingdoms, then each Kingdom is divided into Phyla (Phylum plural), then each Phylum into Classes, then Orders, then Families, then Genus, then Species. Sometimes there are sub-groupings which make this system a little more confusing.

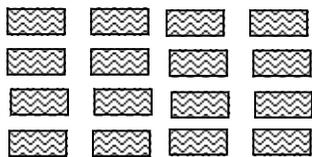


For learning about insects in Minnesota, it is generally easiest to identify insects to their Order. The eight insect orders most commonly found in Minnesota are:

- Coleoptera** (coe-lee-OP-ter-ra) Meaning Sheathed-winged
- Diptera** (DIP-ter-ra) Meaning Two-winged
- Hemiptera** (hem-IP-ter-ra) Meaning Half-winged
- Homoptera** (hom-OP-ter-ra) Meaning Same-winged
- Hymenoptera** (hi-men-OP-ter-ra) Meaning Membranous-winged
- Lepidoptera** (leh-pih-DOP-ter-ra) Meaning Scaly-winged
- Odonata** (oh-doe-NA-ta) Meaning Teeth, Strong Jawed
- Orthoptera** (or-THOP-ter-ra) Meaning Straight-winged

Procedures:

1. Have the class split in to groups of two or three.
2. Hand out a copy of the *Insect Order Cards* to each group.
3. Have them study the sheet, reading the descriptions of each Order and practicing the pronunciation of the names.
4. When each group thinks they have learned the eight Orders, have them cut out the cards on the black lines. It is important that the cards are cut fairly straight and are kept uniform in size.
5. After the cards have been cut out, they will be used in a slightly more difficult version of Memory. Students will not be matching up two pictures together. Instead, they will be matching up the name of an insect Order with the picture of a representative from that Order. Notice that the picture cards are labeled with the name of the insect pictured and the Order cards have example members listed, with the name of one example **bolded**. The bolded name on the Order card is the same name as labeled on the picture card.
6. Students will place all sixteen cards face-down in a grid pattern:



7. Each student will take a turn consisting of choosing two cards to turn over (one at a time) trying to make a match. If a student successfully makes a match, they keep those cards and get another chance to make a match by turning over two cards (one at a time). A turn is over when a match is not successfully made. It is important that all that are playing pay close attention to cards being turned over as it could help them later on in the game. The game ends when all the pairs have been successfully made. The player with the most cards wins.
8. Assess your students' abilities:
 - Are your students able to differentiate between the eight most common insect Orders?
 - Can they find any of the characteristics in the drawings of the example insects?
 - Are they able to remember the meaning of the Latin names to help them remember what kinds of insects belong to each Order?

Teacher Tips

- Print the 5th and 6th page of this document back-to-back, unless you are gluing them on to cardstock, then you only need page 5.
- You may want to cut out the cards yourself in advance so they are cut uniformly.
- You may have your students glue them on to cardstock or note cards to make them more sturdy.
- If you cut the cards out in advance, you may need to hand out full sheets as well to allow students to learn the different Orders before they play the game.



Additional Resources

<http://www.earthlife.net/insects/orders.html>

This allows you to click on the name of an insect order and learn all about that group of insects. Lots of great background information.

<http://www.uky.edu/Ag/Entomology/ythfacts/bugfun/collecti.htm>

A website designed for kids to navigate and learn about different ways to capture insects in different settings.

<http://members.aol.com/YESedu/kidsfun.html>

This webpage gives suggestions for other insect related activities for kids at different age levels.

<http://www.ivyhall.district96.k12.il.us/4th/kkhp/1insects/buginfo.html>

Basic introduction to insects and their lifecycles.

Match the collecting tool with the habitat:

During the *Insects* class at Eagle Bluff, you will be capturing insects in several different types of habitats. Each habitat has unique vegetation and other features, requiring a different type of tool for each one.

Read the descriptions of the tools below and draw a line from the tool to the picture of the habitat in which you think it would work best.

Debris Sifter

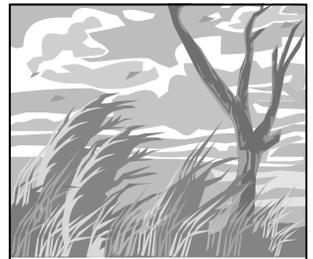
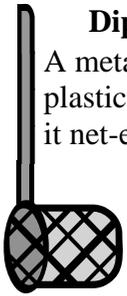
A plastic container with large holes in the bottom and a white cover. Dry leaves can be scooped into the container and then shaken so the insects living in the leaves fall out the holes in the bottom onto the white cover.



Young Forest

Dip Net

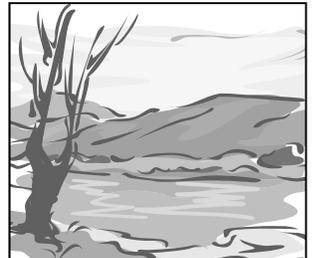
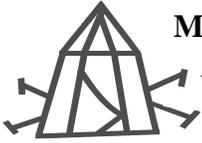
A metal-handled net with strong plastic netting. It is used by holding it net-end down and swirling it in shallow water or bumping it along the bottom to catch swimming and crawling macroinvertebrates.



Grasslands

Malaise Tent

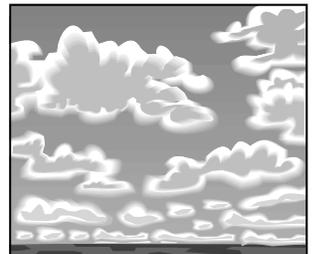
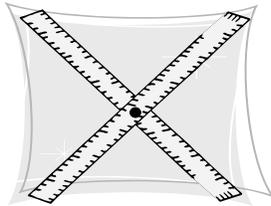
A fine mesh tent with one side held open and a light placed inside at the top. The light attracts flying insects in to the tent overnight. The insects cannot find their way out, trapping them in the morning.



Pond or Lake

Beating Sheet

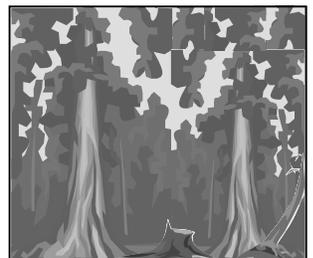
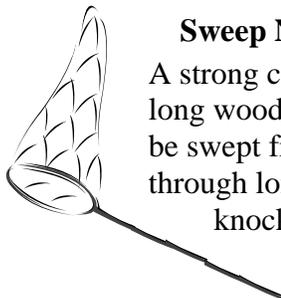
A piece of light-colored fabric, held open by two crossing yardsticks is placed on the ground to catch insects shaken off of shrubs and bushes.



Open Air

Sweep Net

A strong canvas net with a long wooden handle. It can be swept from side to side through long grass, knocking insects into the canvas net.



Mature Forest

Answer Sheet: Match tool with habitat...

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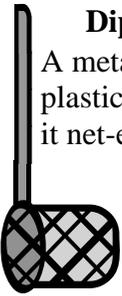
A plastic container with large holes in the bottom and a white cover. Dry leaves can be scooped into the container and then shaken so the insects living in the leaves fall out the holes in the bottom onto the white cover.



Young Forest

Dip Net

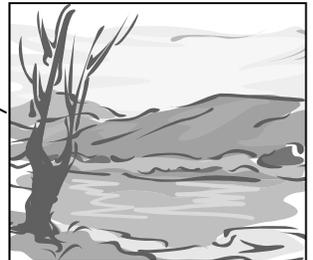
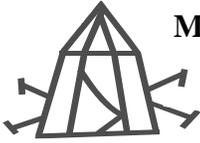
A metal-handled net with strong plastic netting. It is used by holding it net-end down and swirling it in shallow water or bumping it along the bottom to catch swimming and crawling macroinvertebrates.



Grasslands

Malaise Tent

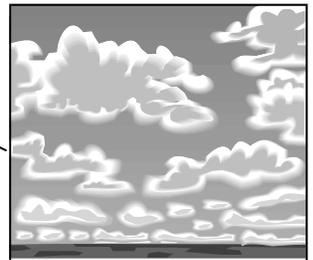
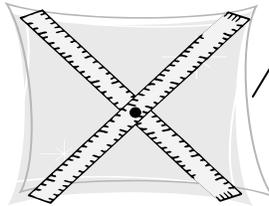
A fine mesh tent with one side held open and a light placed inside at the top. The light attracts flying insects in to the tent overnight. The insects cannot find their way out, trapping them in the morning.



Pond or Lake

Beating Sheet

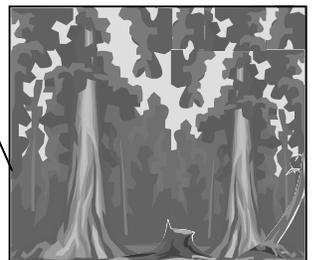
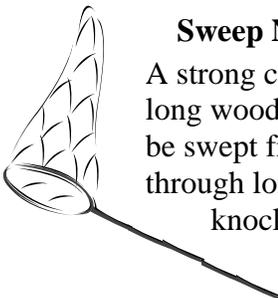
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Open Air

Sweep Net

A strong canvas net with a long wooden handle. It can be swept from side to side through long grass, knocking insects into the canvas net.



Mature Forest

Hymenoptera (hi-men-NOP-ter-ra)

- Means Membranous-winged.
- 4 clear wings.
- Hind wings smaller than front.
- Most have narrow waists

• Chewing or sucking mouthparts.

Example Members:

- Bees
- Ants
- **Wasp**



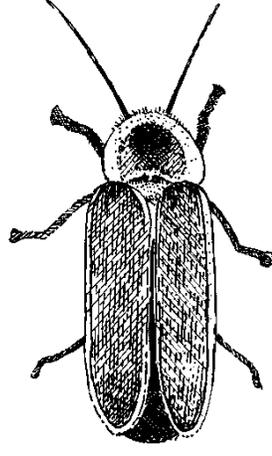
Wasp

Coleoptera (coe-lee-OL-ter-ra)

- Means Sheath-winged.
- 4 wings.
- Front wings clear, under front wings.
- Hind wings clear, under front wings.
- Wings form line down back when folded.
- Chewing mouthparts.

Example Members:

- June beetles
- Asian lady beetles
- **Lightening Bug**



Lightening Bug

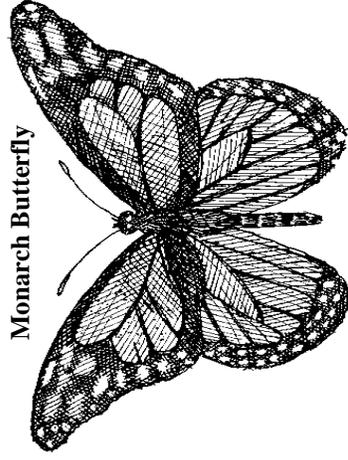
Lepidoptera (leh-pih-DOP-ter-ra)

- Means Scaly-winged
- 4 wings
- Wings covered in scales, giving them color.
- Sucking mouthparts.

Example Members:

- Moths
- **Butterflies**

Monarch Butterfly

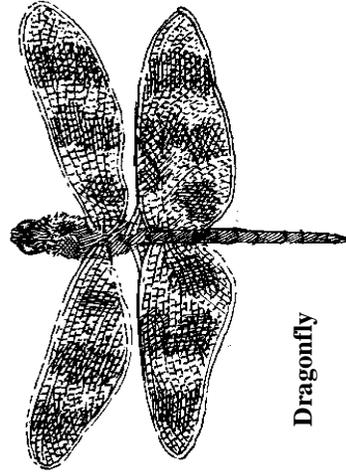


Odonata (oh-doe-NAY-ta)

- Means Teeth, Strong-jawed
- 4 wings, long, narrow and finely netted.
- Large eyes.
- Chewing mouthparts.

Example Members:

- Damselflies
- **Dragonflies**



Dragonfly

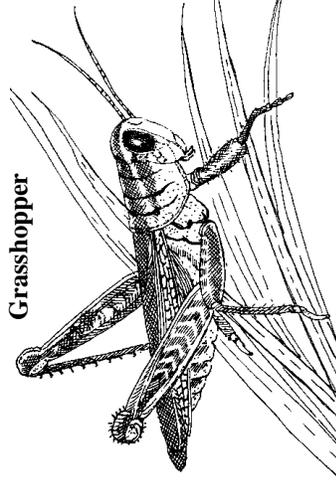
Orthoptera (or-THOP-ter-ra)

- Means Strait-winged
- 4 wings when present.
- Front wings leathery and straight.
- Hind wings folded like a fan.

• Chewing mouthparts.

- Some have powerful jumping legs.
- Crickets
- Katydid
- **Grasshoppers**

Grasshopper



Diptera (DIP-ter-ra)

- Means Two-winged.
- 2 clear wings.
- Has 2 club-shaped parts instead of hind wings.
- Sucking mouthparts.

Example Members:

- Mosquitoes
- Gnats
- **House Fly**



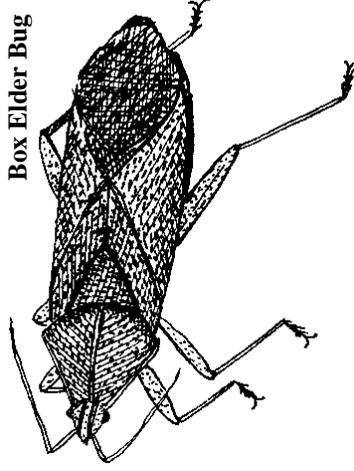
House Fly

Hemiptera (he-MIP-ter-ra)

- Means Half-winged
- 4 wings.
- Wings form "X" on back when folded.
- Front wings half leathery and half membranous.
- Sucking mouthparts.

Example Members:

- Stink bugs
- Shield Bugs
- **Box Elder Bug**



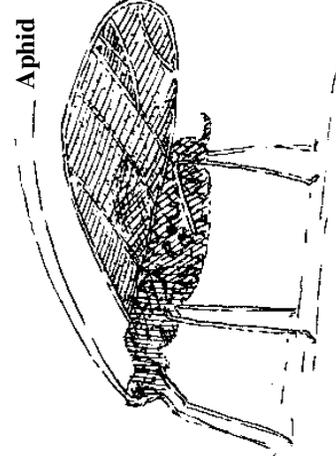
Box Elder Bug

Homoptera (ho-MOP-ter-ra)

- Means Same-winged
- 4 wings.
- Front wings clear or leathery.
- Wings folded over back like a roof.
- Sucking mouthparts.

Example Members:

- Leafhoppers
- Treehoppers
- **Aphid**



Aphid