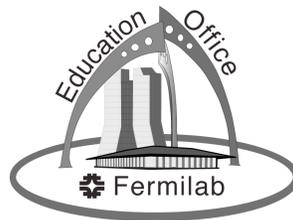




# **Insect Workshop and Field Trip for Grades 1-2**

## **Sampler**



## Introduction

Insects are everywhere . . . from the highest mountains to the shores of the deepest oceans; from the hottest deserts to the coldest regions of the Earth. They are in the soil beneath your feet, the air above your head, the water you splash in, and even on you. Insects have inhabited the earth for hundreds of millions of years. Currently, there are more than one million different identified species of insects in the world—making up more than half of all living things on this planet! Scientists believe this may only be a fraction of what exists and that there may be more than four million insects that have yet to be discovered. Perhaps there is a student in your classroom who will discover a species of insects not yet known to man!

Without insects to pollinate plants, serve as food for other living things, decompose organic materials, till the soil and prevent overpopulation of arthropods, the world we live in today would not be the same, or might not even exist. “So important are insects and other land dwelling arthropods that if all were to disappear, humanity probably could not last for more than a few months” states Edward O. Wilson of Harvard University. These facts give good reason as to why this generation needs to be taught the connection that exists between humans, insects and the natural environment.

Insects belong to a group of animals called arthropods. There are five major classes of arthropods, and insects belong to the largest group. Insects are characterized by having three body segments—the head, the thorax, and the abdomen. They have six legs and usually two pairs of wings attached to the thorax. Insects display antennae and most have compound and/or simple eyes. Scientists classify insects into groups. Species that have scientific names can be recognized anywhere in the world regardless of what language is spoken. Currently there are 32 different orders of insects. Eight of the more common orders are *Coleoptera* (which means sheath-winged), *Diptera* (two-winged), *Hemiptera* (half-winged), *Homoptera* (same-winged), *Hymenoptera* (membranous-winged), *Lepidoptera* (scaly-winged), *Odonata* (strong-jawed) and *Orthoptera* (straight-winged).

All living things experience a life cycle. A life cycle is a repeating process of birth, growth, reproduction and death that occurs among every living species. Most animals including fish, mammals, reptiles, birds and silverfish have very simple life cycles. *Simple life cycles* consist of three stages—birth, young and adult. Less than 1% of all insects have simple life cycles. Some animals have a slightly more complicated life cycle called an *incomplete life cycle*, characterized by a three-stage cycle—egg, nymph (young stage when most of the feeding is done) and adult (final breeding stage). Approximately 10% of insects fall into this group, and include insects such as dragonflies, damselflies, milkweed bugs, water bugs, cicadas, aphids, praying mantises, grasshoppers and katydids. Most insects (approximately 90%) undergo a *complete metamorphosis* passing through amazing changes to become an adult. They have four stages in their life cycle—egg, larva (young stage when most of the feeding is done), pupa (inactive with no feeding between larva and adult) and adult (final breeding stage).

There are five main roles insects play: 1) decomposers, 2) pollinators, 3) soil tillers, 4) producers and 5) population controllers. Insects play a very important role in the health of our environment. As decomposers, insects rid the world of decaying organic matter and replace it with nutrients that feed the soil and are used by plants. Pollinators such as bees, beetles, flies, wasps, butterflies and moths, become covered in pollen. As they move from plant to plant, feeding, they pollinate or fertilize plants. Soil tillers turn over the soil, allowing air and water into the ground, helping make it

better suited for growing plants. Insects produce materials that are useful to people and other living things. Honeybees give us honey to eat and beeswax that can be made into candles, the larva of the silkworm moth produces silk that can be made into cloth, and fly maggots have been used in medicines to help clean and treat wounds. Insects known as population controllers hunt, capture and eat other insects. In this way, they help reduce the number of insects that might destroy our gardens and crops. As you can see, insects are busy at work in our world.

Hundreds of species of wildlife, such as mammals, birds and insects are now found at Fermilab. Prairie restoration began in the Main Ring at Fermilab in 1975. Dr. Robert Betz, former professor of biology at Northeastern Illinois University, Raymond Schulenberg, former curator of plant collections at Morton Arboretum, and a few dedicated Fermilab employees piloted the project. Thus began a project that eventually led to over 1,100 acres of prairie being restored on the Fermilab site. Many of the insects present are vital to the success of the prairie plant community as they pollinate, till the soil, and are food which support the population of larger animals. Conversely, the diverse prairie plant population should encourage the presence of many different kinds of insects.

In a natural wooded area, decomposing logs and leaf litter are in the process of returning food and nutrients to the soil. The insects and their relatives aid fungi and other organisms in this decomposition. Areas under the bark and logs provide homes for these organisms. Decomposers visible to the naked eye may be observed at the on-site Fermilab visit.

Some species of insects live in and around the wetland areas. Examining invertebrates living in the water can help determine the quality of the wetland. A wide variety of diversity of invertebrates generally indicates better water quality.

It is never too early to teach the ideas of conservation and thoughtful consideration of our actions on the environment. Unless people understand the interconnections between all living things, they may initiate action that could have devastating consequences. If people develop an appreciation for insect populations and an understanding of the benefits they provide, they will be more likely to consider the effects of using pesticides or of introducing non-native species into the environment. Children are exposed to negative attitudes toward insects very early in life; after all, bees and wasps sting, “bugs” bite, and ants, flies and other “bugs” get into our food. Only 3% of known insects are actually pests. The true number is probably much less than 1% since insect pests are much more visible than their helpful counterparts.

There are many delights awaiting the curious child, quite possibly in their own backyard. At some point, most children love collecting caterpillars, chasing butterflies, capturing lightning bugs, digging for ants or touching pill bugs to see them roll into a ball. Taking advantage of this natural curiosity, it's up to us, as adults, to teach children about the natural wonders all around us and how our actions can greatly affect the overall health of even our own backyard environment. Children need to be taught to observe without disturbing wildlife and should be encouraged to always put living things back where they were found.

# Overview

At Fermilab, an exciting example of our past and our future, we search for elusive particles that make up our universe. These particles have been around since the beginning of time. Future discoveries at Fermilab will lead to a better understanding of how the universe is made and how it works.

Well known as a national physics laboratory, Fermilab was also designated as a National Environmental Research Park in 1989. Fermilab's restored prairies, forests, ponds and grasslands are home to many insects. Insects have been around for millions of years, and like the particles, many are elusive.

The goal of *Insects at Work in Our World* is to provide young learners with the opportunity to observe and study insects to be apprentice entomologists. The engaging hands-on, interactive focus of this instructional unit is these elusive “critters” and the need to protect them and their environment.

## Research Component

Students prepare for field studies at Fermilab by gathering background information and practicing skills of observing, questioning, sorting, keeping records and sharing information. They keep their work in an insect journal. They conduct field studies collecting, sorting and comparing insects from several habitats and discuss their findings.

When students learn interesting facts about insects and become more familiar with their habits, the “fear factor” is often removed from working with live specimens. By collecting and observing live specimens, students are often motivated to do further research on their own to find out more about the insects they have observed.

## Essential Knowledge

- Entomologists are scientists who study insects.
- Insects have characteristic structures and behaviors that separate them from their closest relatives.
- Insects are divided into groups according to similarities and differences.
- Throughout their life cycles, the structures of insects change and may look very different from one stage to another.
- The five main jobs of insects are decomposers, pollinators, soil tillers, producers and pest controllers.

## Developing Scientific Thinking Processes and Skills

1. Observing:
  - a. Scientists use observation as a powerful tool to learn about nature.
  - b. Scientists make accurate drawings with details about the subject.
  - c. Scientists keep detailed and accurate records of their work.
2. Using tools in science:
  - a. Scientists use field guides and models to learn about and identify things in nature.
  - b. Scientists use magnifying lenses and microscopes to examine objects closely and see details they might not see otherwise.
3. Communicating:
  - a. Scientists work in cooperative groups, discussing observations and ideas.

- b. Scientists keep a record of their findings by writing detailed descriptions and making accurate drawings.
  - c. Scientists share descriptions of their work with others.
4. Comparing and organizing:
- a. Scientists use knowledge gained from discussion to add to their journals.
  - c. Scientists organize objects according to their similarities and differences.

### Class Time

Student interest is best generated through scientific inquiry, “doing science.” We divide class time into three sections.

#### **Engaging the Students**

Generate student interest by confronting their understanding with an interesting artifact or question. For example, students could examine insect models, live insects, preserved insect collections or pictures.

Facilitate a discussion by asking students “what they know and what they would like to find out.” Set up a way to post and track student input. As a rule:

- Post items throughout the unit.
- Accept all comments and questions. Consolidate similar items.
- Return to questions that students can answer through their research and post answers.
- Replace or remove items that students learn are no longer relevant or appropriate.

#### **Investigating**

Provide students (ideally in pairs) with specimens, tools and time to investigate. Refer to the postings and remind students of the purpose of their investigations. Give each student an opportunity to use all the tools. Have each student record the observations made by all members of the group in his or her journal. Their journals should include written observations and detailed drawings where appropriate. They could also attach pictures or other materials they acquire. A dictionary in the back of the journal allows students to keep a list of new words and their meanings.

#### **Sharing and Summarizing**

Have research groups share the findings. Facilitate discussion among the groups to help students determine which observations were accurate. Post the accurate findings. Compare these findings to the postings done prior to their investigations. Facilitate a discussion to determine whether or not the earlier postings are valid. Eliminate any information from the postings that the students have agreed are incorrect. Have students add the corrected information to their journals. Revisit the student’s questions to determine if any of them were answered by their investigations. If so add this information to their journals. An appropriate book related to the lesson may be read to the students. As students investigate and increase their knowledge about insects, they will be acting as apprentice entomologists, scientists who study insects. Putting students in this role will increase their desire to practice scientific inquiry by asking questions, investigating to answer their questions. It will entice them to want to share their findings with their classmates and to want to find out more.

Like all scientists, entomologists must keep detailed records of their research and findings. During class, students will record questions, drawings and notes in their science journals, which may be reviewed as part of unit assessment.

## **Teaching Tips**

### Cooperative Learning Strategies

Scientists often work collaboratively to share knowledge and solve complex problems. Often the task of collecting the specimens is difficult for small children, and they are better able to accomplish this task with the help of others. Working in small groups to collect and observe specimens allows students the opportunity to interact with other students to accomplish their goal of gaining information from live specimens. Shared observations add to the experience.

### Collecting Insects

Fermilab's prairies, ponds, forests and grasslands are excellent environments in which to study insects and their relatives. The diversity of plants in these communities provides habitats for many species of insects. An on-site visit to Fermilab gives students the opportunity to compare insects from these different habitats. The docent-led field trip enhances the learning that has taken place in the classroom.

If an on-site visit is not possible, habitats in the schoolyard or nearby should be used to enhance classroom learning. As the students work in these habitats, it is important to emphasize that the surroundings should be disturbed as little as possible and that all specimens be returned to where they were found.

### Recording Data

Scientists keep a journal of their work. Each student should be provided with a journal for recording data. By referring back to the data in their individual journal, the student will be able to add to the discussion when comparing and organizing class data. A sample journal cover and page is provided at the end of this section. The dictionary pages may be added to the back of the journal to allow students to keep a record of new words they learned while doing science.

### Live Insects in the Classroom

Live insects and their habitats may be ordered from a science supply house (see Resources). Live insects used in the Metamorphosis Live Exploration should be ordered before beginning the unit of study. This allows students to make and record observations of the live specimens while performing other explorations and activities in the unit.

**Insects at Work in Our World**  
**What is an Insect?**  
**Illinois Learning Standards**

<b>Explorations and Activities</b>	<b>LA</b>	<b>LA</b>	<b>LA</b>	<b>LA</b>	<b>LA</b>	<b>Math</b>	<b>Math</b>	<b>Math</b>	<b>Math</b>	<b>Math</b>	<b>Science</b>	<b>Science</b>	<b>Science</b>	<b>Fine Arts</b>	<b>Fine Arts</b>	<b>Fine Arts</b>
<b>GOAL</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>	<b>11</b>	<b>12</b>	<b>13</b>	<b>25</b>	<b>26</b>	<b>27</b>
Insects and Entomologists	A, B, C		C	A, B	A, C						A	A	A			
Create an Insect	A					B, D	A, B				A	A			B	
Using My Senses			A	A, B												
Hop to It!						A, B, C, D	A, B			A, B						
Fascinating Facts	A, B		A, B, C	A							A					
Insect Riddles			A	A, B							A					
Insect or Not an Insect	A										A					
Insects in the School Yard	A		B	A, B	A, B						A	A, B				

**Insects at Work in Our World**  
**Sorting Insects**  
**Illinois Learning Standards**

Explorations and Activities	LA	LA	LA	LA	LA	Math	Math	Math	Math	Math	Science	Science	Science	Fine Arts	Fine Arts	Fine Arts
<b>GOAL</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>	<b>11</b>	<b>12</b>	<b>13</b>	<b>25</b>	<b>26</b>	<b>27</b>
Sorting "Critters"	A, B, C		C	A, B	A, C						A	A	A			
Sorting Common Insects	A		C	A, B	A, C						A	A	A			
Illinois Common Insects	A		C	A, B	A, C						A	A	A			
Insect Orders Bingo				A												

**Insects at Work in Our World**  
**Insect Metamorphosis**  
**Illinois Learning Standards**

Explorations and Activities	LA	LA	LA	LA	LA	Math	Math	Math	Math	Math	Science	Science	Science	Fine Arts	Fine Arts	Fine Arts
<b>GOAL</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>	<b>11</b>	<b>12</b>	<b>13</b>	<b>25</b>	<b>26</b>	<b>27</b>
Life Cycles	A, B, C		A, B, C	A, B	A, C						A	A	A			

**Insects at Work in Our World  
Insect Jobs in Our World  
Illinois Learning Standards**

Explorations and Activities	LA	LA	LA	LA	LA	Math	Math	Math	Math	Math	Science	Science	Science	Fine Arts	Fine Arts	Fine Arts
GOAL	1	2	3	4	5	6	7	8	9	10	11	12	13	25	26	27
Insect Jobs in Our World	A, B, C		C	A, B	A, C								A, B			
Insects for Hire	A, B, C		C	A, B, C	A, B, C						A	A	A		B	
What Do You Do?	A			A												
Memory Cards				A												

**Insects at Work in Our World  
On-site Activities  
Illinois Learning Standards**

Explorations and Activities	LA	LA	LA	LA	LA	Math	Math	Math	Math	Math	Science	Science	Science	Fine Arts	Fine Arts	Fine Arts
GOAL	1	2	3	4	5	6	7	8	9	10	11	12	13	25	26	27
Pollinators on the Prairie	A										A					
Life on a Log	A										A					
Waders in the Water	A										A					
Insects and Their Adaptations	A										A					



# Table of Contents

On Beyond Bugs

Introduction

Overview

## **Science Journal**

Science Journal Cover

Science Journal Pages

Science Journal Dictionary

## Chapter 1

### **Science Exploration 1-1 Insects and Entomologist**

Create an Insect – activity

Insect Body Parts – worksheet

Insect Bodies - song

The Insect Song

Insect Parts – assessment

Using My Senses – activity

When I ... – worksheet

Walking on Ears – worksheet

Senses Chart – worksheet

Cricket Senses – assessment

Hop to It – activity

Hop to It – worksheet

Fascinating Facts – activity

Fascinating Fact Sheet

Charade Cards

Charade Cards with Examples

Insect Riddles – activity

My Insect Riddles

### **Science Exploration 1-2 Insect or Not an Insect**

Dragonfly Pieces

Insect or Not an Insect Game Cards

What Makes a Bug an Insect? – tool

### **Science Exploration 1-3 Insects in the Schoolyard**

Insects All Around – song

Venn Diagram with Answers

Venn Diagram – blank

Favorite Insect Survey – activity

Favorite Insect Survey – data sheet

## Chapter 2

### **Sorting Critters – Science Exploration**

### **Sorting Common Insects – Science Exploration**

## **Illinois Common Insects – Science Exploration**

Insect Order Bingo – activity  
Pieces to Cut Apart for Bingo  
Bingo Card 1-5  
Trading Cards – instructions  
Trading Cards  
This Insect House – worksheet  
Insect Orders Worksheet – answers  
Insect Orders Worksheet – assessment  
Order Posters

### Chapter 3

#### **Science Exploration 3-1 Insect Metamorphosis**

Simple Metamorphosis - activity  
Incomplete Metamorphosis – activity  
Complete Metamorphosis – activity  
Butterfly, Butterfly – poem  
Caterpillar Song  
Look, I'm a Butterfly! – song  
Sorting Guide for Insects  
Working with Live Insects  
Mealworm Poem  
Insect Development – poster  
My Oh My a Butterfly – activity  
Butterfly Flip Book  
Growing and Changing – activity  
Teacher Narrative for Growing and Changing  
Look at Me! – assessment

#### **Science Exploration 3-2 Metamorphosis Live!**

Working with Live Insects  
Mealworm Poem

### Chapter 4

#### **Science Exploration 4-1 Insect Jobs in Our World**

Decomposers – poster  
Population Controllers – poster  
Pollinators – poster  
Producers - poster  
Soil Tillers – poster  
Decomposers – booklet page  
Population Controllers – booklet page  
Pollinators – booklet page  
Producers – booklet page  
Soil Tillers – booklet page  
Insects for Hire! – activity  
What Do You Do? – activity  
What Do You Do? – chant

What Do You Do? – character cards  
Memory - activity  
Memory Cards  
Go Fish – activity  
Go Fish Cards  
Bee Boogie – activity  
Bee Boogie Dance Instructions  
Insects and Birds – activity  
Insect Jobs – assessment  
Insects at Work in Our World – assessment

## Chapter 5

### **Science Exploration 6-1 Pollinators on the Prairie**

Pollinator on the Prairie Data Sheet  
Pollinator on the Prairie – student reflections

### **Science Exploration 6-2 Life in a Log**

Life in a Log Data Sheet  
Life in a Log – student reflections

### **Science Exploration 6-3 Waders in the Water**

Waders in the Water Data Sheet  
Waders in the Water – student reflections  
How Clean is the Water? – species indicator sheet

### **Science Exploration 6-4 Insects and Their Adaptations**

Insects and Their Adaptations Data Sheet  
Insects and Their Adaptations – student reflections

## Chapter 6

Insects and Language Arts  
Butterfly – poem  
Caterpillar Song – song  
Caterpillars – poem  
Five Fuzzy Caterpillars – finger play  
Insect Bodies – song  
Look! I'm a Butterfly! – song  
Mealworm Poem  
The Insect Song  
Insect Haiku  
Haiku Practice Sheet  
Cinquain  
Windspark poem  
Poetry Rubric

## Chapter 7

Insect Research  
Research Pages

## Science Exploration 4-1

# Insect Jobs in Our World

### Essential Knowledge

- Entomologists are scientists who study insects.
- Insects are divided into groups according to similarities and differences.
- The five main jobs of insects are decomposing, pollinating, soil tilling, producing and controlling pests.

### Skills

1. Observing:
  - a. Scientists use observation as a powerful tool to learn about nature.
2. Using tools in science:
  - a. Scientists use field guides and models to learn about and identify things in nature.
3. Communicating:
  - a. Scientists work in cooperative groups to discuss observations and ideas.
  - b. Scientists share descriptions of their work with others.
4. Comparing and organizing:
  - a. Scientists use knowledge gained from discussion to add to their journals.
  - b. Scientists organize objects according to their similarities and differences.

### Learner Outcomes

Students will be able to:

- Describe some jobs performed by people.
- Describe the importance of animals in our world.
- Name the five main roles of insects.
- Describe the importance of insects in our environment.

### Materials

- Items such as stethoscope, shovel, fire truck, police badge, hammer, weather map, map of stars, magnifying lenses, etc.
- Science journals
- Chart paper
- Sets of pictures of insects at work in nature
- “Insect tools” including a Q-tip (fuzzy body of a bee), small piece of pipe cleaner (jointed legs of an insect), plastic forceps (claws or jaws of an insect), and plastic pipette (mouthparts of an insect)
- Book, *Helpful And Harmful Insects*, by Aloian, Molly and Kalman
- Posters that describe the different jobs performed by insects
- Pages to create booklet describing the different jobs performed by insects
- Activity 1: Insects for Hire
- Activity 2: What Do You Do?
- Activity 3: Memory
- Activity 4: Go Fish
- Insect Job Description - assessment
- Insects at Work in Our World - assessment

## **Background**

When we hear the word “insect,” we often have negative thoughts—buzzing, stinging, biting, etc. Insects, however, play a very important role in the health of our environment. Some of the ways insects are useful include:

- Insects are valuable sources of food for birds, fish, toads, lizards, snakes and frogs, as well as many mammals.
- Insects produce useful things for us such as honey, beeswax and silk.
- Insects pollinate many food crops, flowers and plants.
- Insects are predators of pests that can destroy plants in our gardens and food crops.
- Many insects also play critical roles in recycling plant and animal materials, eliminating waste and keeping the soil healthy.

People’s lives would be very different without the benefits provided by insects. It is highly unlikely that people would be able to survive on earth without insects.

## **Class Time**

### **Exploration Part I**

#### **Engaging the Students**

- Facilitate a discussion of careers the students would like to have when they are older (ask students who are unable to give an answer to share with the group a job their parent performs) and record the jobs on chart paper.
- Ask students to turn to a partner and discuss the importance of all the jobs listed—why we need people doing these different jobs.
- Divide students into small groups and give each group items such as stethoscope, shovel, fire truck, police badge, hammer, weather map, map of the stars, magnifying lens, etc.

#### **Investigation**

Students will:

- Examine the items, identify jobs in which these tools might be used and discuss how these jobs benefit us.
- Record in their journals tools that entomologists use.

#### **Sharing and Summarizing**

- Have each group share their findings and post them on different pieces of chart paper, grouping similar information together.

### **Exploration Part II**

#### **Engaging the Students**

- Facilitate a discussion of the roles different animals play in our lives. Examples: We get food from chickens, pigs and cows. Dogs and cats give us pleasure. Horses can be used for traveling.
- Find out what students know and would like to find out about the jobs insects do that make our world a better place.

#### **Investigation**

Students will:

- Work in cooperative groups.

- Examine the sets of pictures of insects working in nature and record their observations of what they think the insects are doing in each picture along with an idea of how these insects are helping people.
- Explore a set of “insect tools” including a Q-tip (fuzzy body of bee), piece of pipe cleaner (jointed legs of an insect), plastic forceps (claws or jaws of an insect), and plastic pipette (mouthparts of an insect) that are used in doing their jobs.
- Record ideas about how insects use these “body parts.”

### **Sharing and Summarizing**

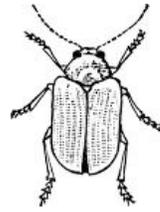
- Have each group share what they have observed the insects doing in the different pictures and post their findings on five different pieces of chart paper grouping similar information together.
- Facilitate a discussion on how insects might use their “tools” and add their ideas to the appropriate chart paper.
- Read book, *Helpful and Harmful Insects*.
- Add new learning from the book to the charts as needed.
- Elicit the five different jobs insects perform (pollinate, produce, decompose, till soil, control pests) and label each chart of information with the correct heading.
- Hang posters and/or create booklet describing the different jobs insects perform.
- Activity 1: Insects for Hire
- Activity 2: What Do You Do?
- Activity 3: Memory
- Activity 4: Go Fish
- Activity 5: Bee Boogie
- Activity 6: Insects and Birds
- Insect Job Description - assessment
- Insects at Work in Our World - assessment

## The Decomposers

These insects feed on and recycle the dead bodies of animals and decaying plants.



Fly



Beetle



Wasp

They help rid the world of decaying organic matter and replace it with nutrients that make the soil better for growing plants.

## The Pollinators

These insects collect pollen on their bodies as they drink nectar from flowers. When the insects look for more nectar from other flowers, they fertilize the flower with the pollen on their bodies. This process helps to make more plants.



Bees



Butterflies



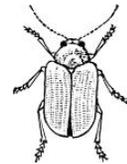
Moths



Flies



Wasps



Beetles

Species of bees, beetles, flies, wasps, butterflies and moths are all successful pollinators. They make good pollinators because they are drawn to plants and like the taste of the sweet nectar that plants produce. They also fly and are able to visit many plants in a short amount of time, transferring pollen from one plant to another.

## The Population Controllers

These insects hunt, capture, and eat other insects.



Ladybug



Praying Mantis



Dragonfly

All of these insects are helpful to people, plants, and animals. They help reduce the number of pest insects that eat flowers and crops and keep insect populations under control.

## The Producers

These insects produce or make something that is helpful to people.



Honeybees



Larva of the Silkworm Moth



Fly Maggot

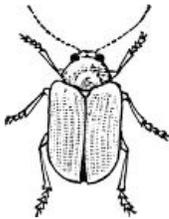
Honeybees give us honey to eat and beeswax that can be made into candles and other products.

The larva of the silkworm moth produces silk that can be made into cloth.

Fly maggots have been used to help clean and treat wounds.

## The Soil Tillers

These insects help to get air and water into the soil that helps to make the soil better suited for growing plants.



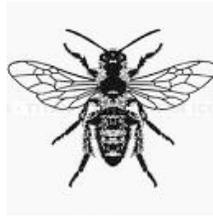
Beetle



Ant



Wasp



Digger bees

As these insects burrow, they turn over the soil, making holes that let air and water into the ground. Waste from these insects fertilizes the soil.

**(To be used with Science Exploration 4-1)**  
**Language Arts – Activity 1**

## **Insects for Hire!**

### **Materials**

- Insect job charts from Exploration 4-1
- Collection of insect-produced goods
- Nonfiction insect books with clear pictures of insects
- Post-it<sup>®</sup> notes
- Tagboard, crayons and markers

### **Activity**

1. Review insect job charts created in Lesson Part I.
2. Share with students the collection of insect-produced goods and allow time for exploration of and questions about products. (Why are these products important?)
3. Share with the students that they are now detectives on the hunt for insects at work.
4. Provide students with a collection of non-fiction books about insects and have them work in cooperative groups to find pictures of working insects. Mark the pages with a Post-it<sup>®</sup> note.
5. Have students choose one of the insects they find to create a “Help Wanted” poster advertising the job that the insect in their picture is performing. Posters will include a picture of the insect and a short description of the “work” being done in the picture.

**(To be used with Science Exploration 4-1)**  
**Language Arts – Activity 2**

## **What Do You Do?**

### **Materials**

- Character cards: 3-4 copies of each card depending on the number of students in the class
- Individual copies of *What Do You Do?* chant or a copy of the chant printed on chart paper

### **Activity**

1. Explain to students that they will be divided into six different groups. Some will remain as students and some will play the role of an insect.
2. Label the groups: the class, the pollinators, the decomposers, the soil tillers, the producers and the population controllers.
3. Have the students assigned to be insects hold the appropriate character card up to identify which insect group they are portraying.
4. Have students perform the chant with each group reading their assigned part.
5. Ask students to switch parts and repeat the chant until all students have had the chance to be a member of each of the five different groups.

# What Do You Do?

**Class:** Pollinators, pollinators, what do you do?

**The Pollinators:** We move pollen for the plants and you.

**Class:** Decomposers, decomposers, what do you do?

**The Decomposers:** We break down dead matter for the plants and you.

**Class:** Soil tillers, soil tillers, what do you do?

**The Soil Tillers:** We aerate the soil for the plants and you.

**Class:** Producers, producers, what do you do?

**The Producers:** We make useful things for other animals and you.

**Class:** Population controllers, population controllers, what do you do?

**The Population Controllers:** We limit the number of insects for the plants and you.

**Class:** Insects, insects, what do you do?

**All Insects:** We make the world a better place for you.



Population  
Controller

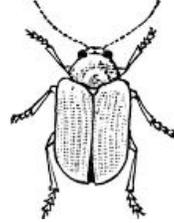


Population  
Controller

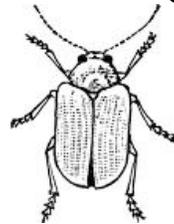




# Decomposer

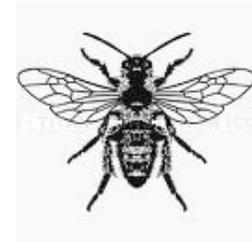


# Decomposer





# Producer

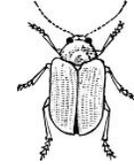


# Producer

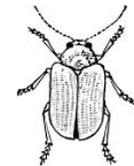




# Pollinator



# Pollinator





# Soil Tiller



# Soil Tiller



# Insects at Work in Our World

## Entomologist \_\_\_\_\_

Circle the **decomposers** with your **black** crayon.

Circle the **pollinators** with your **yellow** crayon.

Circle the **soil tillers** with your **brown** crayon.

Circle the **producers** with your **red** crayon.

Circle the **population controllers** with your **green** crayon.

