



# Frisch's Outreach: Insects and Their Relatives (Gr.1-3) Extensions

### At a glance

This program will help students discover that animals have very unique adaptations that some people may find disturbing yet those very same adaptations enable these animals to make important contributions to our world.

### Goal

This class is designed to familiarize students with the many unique adaptations insects and other arthropods possess.

natural balance of our world.

### Theme

Insects and other arthropods have unique adaptations that help them survive in many different habitats.

### Objectives

1. Students will be able to name the differences between insects and other arthropods.
2. Students will be able to identify at least three body parts of an insect.
3. Students will be able to describe the importance of insects and other arthropods in the

### Sub-themes

1. Insects and other arthropods are quite diverse in their adaptations.
2. The number of Insects and other arthropods is immense.
3. Insects and other arthropods are very beneficial to the natural balance in our world.

### Academic standards

Ohio Science Academic Content Standards	<i>First Grade Standards</i> Life Sciences-1,3,4 Scientific Inquiry – 1,2 Diversity and Interdependence of Life- 5 <i>Second Grade Standards</i> Life Sciences 1,3,5 Scientific Inquiry-1,2,3,5 Diversity and Interdependence of Life – 6
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	<i>Third Grade Standards</i> Life Sciences-2 Diversity and Interdependence of Life-2,6
Kentucky Core Content— Science	Life Science: Grades Primary through 4: <i>The Characteristics of Organisms:</i> SC-E-3.1.2, SC-E-3.1.3 <i>Life Cycle of Organisms:</i> SC-E-3.2.2 <i>Organisms And Their Environment:</i> SC-E-3.3.1 <i>Diversity and Adaptations of Organisms:</i> SC-M-3.4.1, SC-M-3.5.2

## Background

Insects and their relatives are among the most interesting and diverse animals in our world. Their numbers are as vast as the places they inhabit. About  $\frac{3}{4}$  of all known species are arthropods. Insects alone could number up to 10 thousand trillion.

When classifying animals scientists have divided all known animals on Earth into 26 large *Phyla* (a broad collection of animals with important common characteristics). There are far more species in Arthropoda than all other species combined. Arthropods (*Phyla-Arthropoda*) share the characteristics of an exoskeleton, jointed legs, and segmented bodies (except mites and most spiders) and molting.

Some of the classes of Arthropoda that may interest this group of learners could include Insecta (insects), Arachnida (spiders and their relatives), Merostomata (Horseshoe Crabs), Chilopoda (centipedes), Diplopoda (millipedes), Crustacea (crabs, lobsters, shrimp, crayfish).

When discussing some of the classes of Arthropods the class Insecta and Arachnida hold many people's fascination. These animals not only possess very extreme characteristics but can at times cause difficulty for other species. Crop and food stuff destruction can be caused by large numbers of some insects. Conversely, some insects can be extremely beneficial in maintaining the

natural balance of other insect populations and in the benefit of pollination. All members of this Phyla have a vital role in the natural balance of our world.

## Vocabulary

Abdomen- this posterior portion of the body contains organs digesting food, reproducing, and getting rid of waste

Antennae- the two "feelers" used to smell, feel, and in some cases taste and hear.

Arthropod- animals with jointed legs, an exoskeleton, and a segmented invertebrate body

Chitin- a tough semitransparent substance that forms part of the protective cuticle of some insects and other arthropods

Complete metamorphosis- growth stages that include egg, larva, pupa, adult

Ectothermic- an animal that maintains its body temperature by absorbing heat from its surroundings

Exoskeleton- an external skeleton, made of chitin, which serves as a supporting and protective structure

Head- the first segment of the adult insect's body. The antennae, eyes, and mouthparts are found here.

Incomplete metamorphosis-growth stages of egg, nymph, adult

Insect- an animal with three body parts (head, thorax, abdomen), one pair of antennae, six legs, two pair of wings (if any), one pair of compound eyes

Invertebrate- animal without a backbone (insects, crabs, worms)

Larva/Caterpillar- immature form of some animal that undergoes radical transformation into an adult

Metamorphosis. The larva spins a cocoon. The larval structure breaks down and reforms into adult organs.

Molt- when the exoskeleton becomes too small, it splits open around the head and down the back.

Nymph- the second stage of incomplete metamorphosis. The insect looks like a miniature adult. It has no wings and cannot reproduce.

Pollination- the transfer of pollen from the stigma of one flower to the stigma of another by wind, water, insects, birds,

Pupa/Cocoon/Chrysalis- non-feeding third stage of complete Metamorphosis. The larva spins a cocoon. Larval structure breaks down and reforms into adult organs.

Thorax- the body region between the head and the abdomen. This region bears the walking legs and wings.

Vertebrate- animal with a backbone

## **Assessment**

*Unsatisfactory*—student seems uninterested, does not participate, and does not answer questions

*Satisfactory*—student seems somewhat interested, participates to some degree, and attempts to answer questions when asked

*Excellent*—student seems very interested; participates willingly in all activities, and answers questions. Student offers his or her own questions.

## **Extensions**

Who Am I?

Play a "Who am I?" game. Tape a picture of an Arthropod on the back of a student without identifying it. Allow the rest of the class to see the picture. Encourage the student with the picture to ask the group yes/no questions as a means of identifying the Arthropod. The student's questions may focus around adaptations (ex. body coverings and behavior), habitat, food choice, etc.

And The Winner Is.....!

Organize a class or school wide "Beauty Contest". Through research find the contestants, but they must be animals (photos, drawings, sculptures, etc.) that people may find "Creepy". During the contest try to creatively let everyone know what each animal looks like. Also, be sure to creatively give each contestant a chance to show their wonderful attributes (how they move, eat, defend themselves, and especially how they benefit our natural world). Give everyone the chance to vote. You may even want to define categories so to have many "winners"!

My Life As.....!

Write journal entries detailing your life as an Arthropod (insect, arachnid, etc.)

Tell what each day would be like. What is easy about your life? What is difficult? Be sure to tell why your life is important to our natural world!

#### Insect Eye View

What would the world look like to an Insect? Pick a spot on the playground, classroom, or cafeteria and position yourself to experience it like an insect. Can you draw what you see from an insect's perspective?

#### My How You've Changed!

Imagine yourself as an Insect or other Arthropod! What would you look like? Draw, paint, sculpt or write about what you would look like! Be sure to let others know it really is you- but *slightly* different! What could you do now that you have all of those wonderful adaptations?

### Resources

Broda, Herbert, Schoolyard Enhanced Learning: Using the Outdoors as an Instructional Tool K-8, Stenhouse Publishers, 2007.

Ellen, Doris. Meet the Arthropods. The Children's School of Science, Massachusetts. 1996.

Louv, Richard. Last Child in the Woods: Saving Our Children From Nature Deficit Disorder. Algonquin Books, 2005.

Preston Mathem, Rod. The Book of Spiders, Eagle Editions, Quarto Publishing. 1998.

#### Websites:

ALA's Great Websites for Kids:  
Animals

<http://www.ala.org/gwstemplate.cfm?section=greatwebsites&template=/cfapps/gws/displaysection.cfm&sec=1>

Awesome Library – Kids

<http://www.awesomelibrary.org/Classroom/Science/Animals/Animals.html>

Awesome Library – Teachers

<http://www.awesomelibrary.org/Classroom/Science/Animals/Animals.html>

Cincinnati Zoo & Botanical Garden

[www.cincinnati-zoo.org](http://www.cincinnati-zoo.org)

ENature

[www.enature.com](http://www.enature.com)