

## PROGRAM OVERVIEW

Indoors, students are introduced to the variety, diversity and small size of common aquatic invertebrates, including insects. Students will review the life cycles (metamorphosis) of aquatic insects. Following this, they will create a food chain incorporating aquatic invertebrates and discuss the importance of these small animals.

Outdoors, students will hike to Westwood Lake where they will learn a basic sampling technique and use observational skills to identify aquatic invertebrates. A sampling of the smaller invertebrates will be taken back to the nature center.

Returning indoors, students will be able to share what was discovered in the water with the other groups. Some of the smaller invertebrates will be magnified by use of a micro video system .

## TRIP PREPARATION

- ◆ It is essential that the students be dressed for being outside, on the trails and wooden decking for about 60 minutes. Long pants are highly recommended due to the possibility of slivers.
- ◆ Please assist us by having each child and adult accompanying the class wear a nametag.
- ◆ Please see “Recommended Pre-trip Activities” on page 2.

## COMMENTS? QUESTIONS?

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## PROGRAM GOALS

- ◆ Become familiar with aquatic invertebrates, especially insects.
- ◆ Learn a basic sampling technique and use observational skills to identify & classify aquatic invertebrates.
- ◆ Understand the importance of aquatics invertebrates in a food chain.
- ◆ Identify the life cycles (metamorphosis) of insects.

## SLP LEARNER OUTCOMES

*Practice in these areas provided*

- ◆ Examine characteristics and different stages of the life cycle of insects.
- ◆ Compare and contrast the different types of insects.
- ◆ Demonstrate basic needs of insects.

## ACTIVITIES TO ENHANCE YOUR FIELDTRIP TO WESTWOOD HILLS NATURE CENTER

### RECOMMENDED PRE-TRIP ACTIVITIES

- ◆ Discuss complete and incomplete metamorphosis. Some insects have four lifecycle stages: egg, larva, pupa, adult (complete metamorphosis). Other insects only have three lifecycle stages: egg, nymph, adult (incomplete metamorphosis).
- ◆ Discuss the fact that some insects' lives begin in the water and subsequently transition to land. The following are two examples:

The **mosquitoes** undergo complete metamorphosis; the first three stages are aquatic and the adult is on land.

The **dragonflies** undergo incomplete metamorphosis; the first two stages are aquatic, and the adult is on land.

- ◆ Introduce the concept of simple food chains. Some aquatic food chains include:

Snapping turtle < frog < minnow < underwater plants < sun

Great Blue Heron < sunfish < dragonfly nymph < mosquito larva < algae < sun

### ADDITIONAL ACTIVITIES & EXTENSIONS

- ◆ Using the attached sheet of "What Eats What?", have the students build (write, draw or role play) aquatic food chains.
- ◆ Set up an aquarium with pond water for a one-week classroom observation. Be sure to include sunlight, plants and a variety of invertebrates. Have students keep a chart of what they observe (How do the animals move? What animals are seen near the surface of the water? In the middle? On the bottom? Has anything been eaten?). Afterwards, return the water and organisms to the pond from which they came.
- ◆ Discuss the various ways the students will be using water this summer—boating, swimming, fishing, exploring, etc. Is it alright to drink water from a lake, a pond, or a river? Where does the water come from? Introduce the idea of a watershed.

# WHAT EATS WHAT?

This:	Eats this:	And is eaten by:
Algae	Sunlight	Tiny water creatures, minnow, tadpole, scud, snail, water worm, bullhead, mosquito larva
Bacteria	Dead creatures	Tiny water creatures
Bullhead	Snails, scuds, leech, dead creatures, water worms, dragonfly nymphs, algae	Hérons, turtles, raccoons, muskrats, leech, ducks
Cattails	Sunlight	Scuds, bacteria, bullheads, turtles, muskrats
Dead creatures	-----	
Diving beetle	Tadpoles, scuds, water worms, dragonfly nymph, leech, minnows	Raccoons, muskrats, herons, ducks, turtles, dragonfly nymph, sunfish, frog
Dragonfly nymph	Diving beetle, tadpole, scuds, water worms, minnows, mosquito larva	Diving beetle, ducks, raccoons, turtles, sunfish, bullhead
Duck	Duckweed, diving beetle, scud, snail, water worm, dragonfly nymph, minnow, leech, bullhead, underwater plants, mosquito larva	Leech
Duckweed	Sunlight	Snails, minnows, tadpoles, ducks, turtle
Frog	Scud, minnow, diving beetle	Raccoons, leech, heron, turtle, muskrat
Heron	Frog, diving beetle, tadpole, minnow, diving beetle, sunfish, bullhead	Leech
Leech	Turtles, bullheads, ducks, sunfish, frog, heron, muskrat, snail, minnow	Diving beetle, duck, turtle, bullhead, raccoons
Minnow	Underwater plants, duckweed, scud, algae, water worms, tiny water creatures	Ducks, diving beetles, turtles, frogs, leeches, herons, sunfish, dragonfly nymph, raccoons, muskrats
Mosquito larva	Algae,	Sunfish, minnows, ducks, bullheads, dragonfly larva
Muskrat	Cattails, bullheads, minnows, underwater plants, dead creatures, frogs, diving beetles	Leech

## WHAT EATS WHAT? continued

This:	Eats this:	And is eaten by:
Raccoon	Tadpoles, diving beetles, snails, dragonfly nymph, bullhead, frogs, sunfish, leech	Leech
Scud	Dead creatures, algae, tiny water creatures	Minnow, sunfish, duck, dragonfly nymph, diving beetle, turtles, bullheads, frogs
Snail	Cattail, underwater plants, algae, duckweed, tiny water creatures	Raccoon, leech, bullhead, ducks
Sunfish	Diving beetle, scud, leech, water worms, dragonfly nymph, mosquito larva, tadpoles	Hérons, raccoons, leech, turtles
Sunlight	-----	Cattails, algae, underwater plants, duckweed
Tadpole	Algae, duckweed, underwater plants	Diving beetles, herons, raccoons, sunfish, dragonfly nymph
Tiny Water Creatures (Daphnia, copepods, etc)	Bacteria, algae	Scuds, water worms, minnows, snails
Turtle	Dead creatures, minnows, bullheads, sunfish, tadpoles, underwater plants, dragonfly nymph, diving beetle, frogs, scuds, leeches, duckweed	Leech
Underwater plants	Sunlight	Minnows, snails, turtles, ducks, tadpole, muskrat
Water worm	Tiny water creatures, algae	Minnows, sunfish, dragonfly nymphs, bullheads, diving beetles, ducks