



## Class Summary

### Quick Facts

Outside: 1 hours 30 minutes

Grade: 4-8th

Offered: April though October

Physical Activity: 1/4 mile walk including a steep hill

Other: No special skills required

### Concepts

- Form and Function • Identification
- Diversity • Human Impact

### [Minnesota Academic Standards >](#)

- Science • Math • Language Arts

### [Classroom Activities >](#)

- Pre-Activity: *What's Your Function?*
- Post-Activity: *Portable Pond*

### STEM Components

- Identify / Classify
- Illustrate
- Observe / Study / Examine
- Describe
- Explain

### IB Profiles

- |   |  |
|---|--|
| <input checked="" type="checkbox"/> Inquirers     | <input type="checkbox"/> Open-minded           |
| <input checked="" type="checkbox"/> Knowledgeable | <input checked="" type="checkbox"/> Caring     |
| <input checked="" type="checkbox"/> Thinkers      | <input type="checkbox"/> Risk-takers           |
| <input checked="" type="checkbox"/> Communicators | <input type="checkbox"/> Balanced              |
| <input checked="" type="checkbox"/> Principled    | <input checked="" type="checkbox"/> Reflective |

Revised Dec 2011

### Outcomes, students will:

1. Observe and study how physical adaptations are beneficial to aquatic invertebrates.
2. Understand how a diversity of organisms promotes a healthy ecosystem.
3. Illustrate how macroinvertebrates can be used to study the affects of human actions on aquatic ecosystems.

### Brief Synopsis:

Participants will catch and identify examples of a variety of aquatic organisms, learn how their adaptations allow for survival in an aquatic habitat, and explore how bio-indicators (organisms sensitive to environmental changes) help humans understand how our actions can impact aquatic ecosystems.

### Outline:

#### Creature Feature (10 minutes)

A set of cards illustrating the unique features of some local aquatic creatures will be used by the class to match up what the features look like with how the features help each creature survive better in the water. Understanding how form and function fit together will help each student better identify the creatures they will find while exploring the pond.

#### Exploring the Pond (1 hour)

Using various nets, hand lenses, ID keys and pictures, students will capture and identify aquatic invertebrates found in Eagle Bluff's pond. The edges of the pond are muddy and students may get mud on their shoes, or choose to barrow a pair of rubber boots. Creatures will be studied and returned to the pond unharmed in order to illustrate respect for these small creatures.

#### Invertebrate Observations (45 minutes)

Each pair of students will select one captured creature to bring back to the classroom laboratory. Once inside, the creatures will be examined and observed to find out how the creatures use their features for survival. After careful observation, each duo will create and share a short presentation to describe the discoveries of their creature to the rest of the class.

#### Macroinvertebrate Mayhem (30 minutes)

Aquatic species are often sensitive to changes in their habitats, making them bioindicators for the health of that habitat. A tag-style game will be played in which each student becomes a different species of macroinvertebrate trying to survive alterations to their habitat due to human activities. Specialized movements that correspond with adaptations of each creature slow down the more sensitive species, making them better targets for pollutants to effect.

## Outline

Preparation Before Class	(30 min.)
Introduction	(5 min.)
Creature Feature	(10 min.)
The Plan	(15 min.)
Exploring the Pond	(1 hour)
Invertebrate Observations	(45 min.)
Macroinvertebrate Mayhem	(30 min.)
Conclusion	(15 min.)

## Weather Considerations

If lightning should occur, bring already collected Invertebrates inside the classroom and have groups rotate around all buckets to capture with spoon and ID. Macro-invertebrate Mayhem could be played in DC 20, etc. Alternative Activity: Dragonfly Pond

## Equipment

- Greeter Grabber: Creature Feature cards (24)
- Pond Dipping Materials: Plastic spoons (10), Hand lenses (5), ID sheets (5), Bug viewing jars (10), Pond Life Observation Log sheets, Freshwater Invertebrates Booklets (10), Clear Collecting Tub (5), Large bag nets (5), Medium Bait Well nets (5), Small Dip nets (10)
- Invertebrate Observation: Freshwater Invertebrates Book, Stereoscopes with dust covers (10), Glass viewing bowls (10), Plastic Petri dishes (10), Eye droppers (10), Pencil case (25 pencils), Zooplankton Sheets (2)
- Mayhem Materials: Cards (26), Clipboard with marker, Red Rubber Balls (4)
- Dragonfly Pond (4 sets)
- Computer with Camera
- Posters: Macroinvertebrate Mayhem Poster, Pond Life I Poster, Pond Life II Poster, Pond Life III Poster

Aquatic Macroinvertebrates

## Class Framework

### Topic:

Aquatic Macroinvertebrates

### Theme:

Animal adaptations help them survive the pond ecosystem, make them identifiable, and create diversity.

### Universal Concepts and Generalizations:

1. Form and Function: Macroinvertebrates living in an aquatic ecosystem have adaptations to help them survive.
2. Identification: The physical characteristics of a macroinvertebrate aids in its identification.
3. Human Impact: Human actions can have a positive or negative affect on the diversity of aquatic organisms.
4. Diversity: Macro-invertebrate diversity is an indicator of water quality.