Extension
UNIVERSITY OF WISCONSIN-MADISON

Upham Woods Outdoor Learning Center
N194 County Road N, Wisconsin Dells, WI 53965
(608) 254-6461 • https://fyi.extension.wisc.edu/uphamwoods/

UPHAM WOODS

Water Stories Workshop: Make your H_2Own Story!

This assignment is meant to get students using science and their observational skills to create a story that everyone can read and understand. Getting students to perform science and be scientists while having a way to create a story out of their findings is a great combination of the STEM fields and the humanity fields. This assignment is further created to get students into an outdoor classroom where oftentimes learning or doing science can be more fun and memorable. Creating stories about all the bugs you find, the plants and fish in a stream or lake, or all the birds you see flying overhead is an awesome way to share your science with the world!

STEM for All Video Showcase Activity:

The National Science Foundation's "STEM for All" program is a platform where projects that involve science, mathematics, engineering, and or computer science from all around the United States are showcased as videos on the "STEM for All" website. This free presentation of videos about STEM-related projects is a great way to highlight all the work many people and organizations are doing around the country and to further celebrate the students involved in the projects.

Click here to access the "STEM for All" website! Once on the website homepage, explore the different videos present, links available, and tabs on the page. After you have looked around the homepage, search "Water Stories Summit" (https://stemforall2020.videohall.com/presentations/1707) to watch Upham Woods' video on creating water stories! If you have any questions or thoughts on what you see in the videos, you can comment by clicking on the "New Post" tab under the video and then type your question or comment in the text box.

To help you follow along with the Upham Woods video, here are some questions to organize your thoughts!

- Why is getting kids involved with the STEM fields (science, engineering, computer science, mathematics) important? Do you have any interest in these fields?

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Email: uwcomplianceoffice@wisc.edu.

- What factors – human or environmental – can affect water quality?
- How have you formed a personal connection with water?
- What are some ways you could share what you learn about water and water quality?
    - Why is it important to create stories out of science? Why might this be useful?

Aqua Words Activity (for rainy days!):

Objective: This activity is designed to help you use your vocabulary and your relationship with water to explain how and why water and water ecosystems are significant to you!

What you will need:	What you will do:
Pencils, pens, colorful writing utensils! Magazines or newspapers Pictures Paper Glue	1. Think of different words or phrases that relate to water (river, stream, rain, shower, ocean, fish, boats, etc.) 2. Write the words out on a piece of paper. Draw lines between what words relate to each other and water. This will start to construct a word tree! 3. Use pictures of the words or phrases that you find in magazines or newspapers You can make a collage of what water means to you with pictures instead of constructing a word tree

Macroinvertebrates Foray Activity:

Objective: Learn how to find and identify macroinvertebrates that live in the bodies of water in your community!

Background: Macroinvertebrates (bugs you can see without a spine) have different sensitivities to pollutants. The presence or absence of certain bugs can teach us about the water quality of that water body.

What you will need:	What you will do:
Mesh net or sifting device (spoons work, too!) Ice cube tray for sorting out your critters Boots or waterproof sandals. HYPERLINK "http://clean-water.uwex.edu/pubs/pdf/wwwc.pdf" Species identification key	1. Find any size body of water 2. With your sifting device, scoop and poke around in areas that appear to have a lot of decaying or dead biotic material (dead plants, old logs, muck, mud) 3. Lift your sifting device out of the water and check out what critters you may have caught! 4. Sort critters into separate sections of the ice cube tray full of water 5. Use the species identification keys to identify your critters Try several spots – see how many different species you can find!

- Questions:
    - What kind of critters did you find?
    - Were there a lot of one kind or was there a lot of different ones?
    - What kind of habitat did you find the most organisms?

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Personal Sentinel Activity:

Objective: Learn how to write in a way to communicate to people with all types of backgrounds.

What you will need:	What you will do:
News that allows you to learn about an aquatic environmental issue Paper to make a newspaper article by hand Microsoft Word to make one on the computer!	1. Research an issue in current events that deals with water management, water quality, fisheries, or just water in general (examples include storm water pollution, invasive species, etc.) 2. Create a newspaper article with pictures and a story about the issue – be sure to include both sides of the issue, if you can! 3. Include a headline and pictures – be creative!

Creating Your H_2Own Water Story:

Now that you explored the outdoors and had your own adventure with some wacky water critters, write up a story about your experience! This can be in any format, including drawings, poems, skits, short stories, songs, etc. Make sure to include what you did, your findings, and some final thoughts on the experience of conducting science!

An example of a story created about an aqua-adventure can be found here to help inspire you if need be (just scroll to the bottom of the page from the link to find the water stories!).

After you have completed your water story, please share it with us on our Upham Woods Earth Stories Exchange Facebook Group! You can find the group page by searching "Upham Woods Earth Stories Exchange" in Facebook. Once you share your story, we will share one of our own earth stories from Upham Woods back with you!

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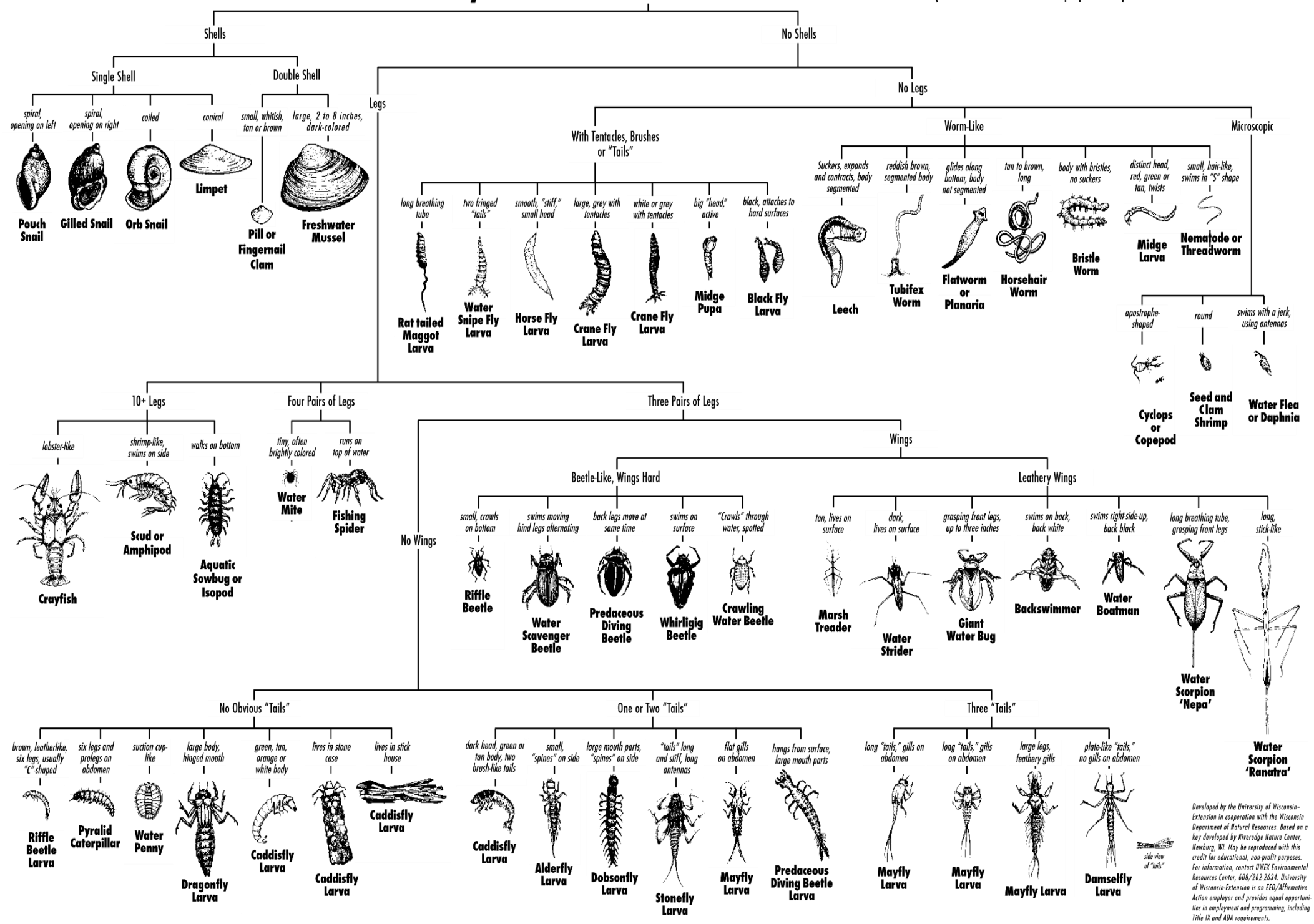
Key to Macroinvertebrate Life in the River

(Sizes of illustrations are not proportional.)



Developed by the University of Wisconsin-Extension in cooperation with the Wisconsin Department of Natural Resources. Based on a key developed by Riveredge Nature Center, Newburg, WI. May be reproduced with this credit for educational, non-profit purposes. For information, contact UWEX Environmental Resources Center, 608/262-2634. University of Wisconsin-Extension is an EEO/Affirmative Action employer and provides equal opportunities in employment and programming, including Title IX and ADA requirements.

Group 1: These are sensitive to pollutants. Circle each animal found.

Stonefly Larva

Dobsonfly Larva

Alderfly Larva

Water Snipe Fly Larva

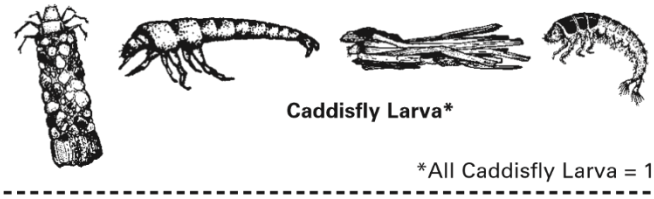
No. of group 1 animals circled:

Relative Size Key:

+ = larger than picture

- = smaller than picture

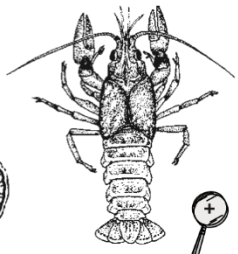
Group 2: These are semi-sensitive to pollutants. Circle each animal found.


Caddisfly Larva*

*All Caddisfly Larva = 1

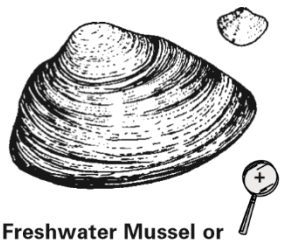
Dragonfly Larva

Water Penny

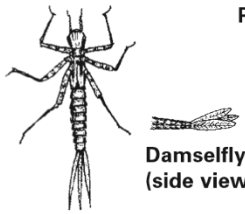

Crawfish

No. of group 2 animals circled:

Crane Fly Larvae


Freshwater Mussel or Fingernail clam

Mayfly Larva


Damselfly tail (side view)

Damselfly Larva

Riffle Beetle Larva*

Riffle Beetle Adult*

*All Riffle Beetles = 1

Group 3: These are semi-tolerant of pollutants. Circle each animal found.

Black Fly Larva

Non-Red Midge Larva

Snails: Orb or Gilled (right side opening)

*All Snails = 1

Amphipod or Scud

No. of group 3 animals circled:

Group 4: These are tolerant of pollutants. Circle each animal found.

Pouch Snail (left side opening)

Isopod or Aquatic Sowbug

Bloodworm Midge Larva (red)

Leech

Tubifex Worm

No. of group 4 animals circled:

For more information, call (608) 265-3887 or (608) 264-8948. Download and print data sheets from watermonitoring.uwex.edu/wav/monitoring/sheets.html

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Water Action Volunteers

Recording form for the Citizen Monitoring Biotic Index

Name: _____Date: _____

Stream Name: _____Time: _____

Location:_____ Site: _____

(County, Township, Range, Section, Road, Intersection, Other)

At this point, you should have collected a wide variety of aquatic macroinvertebrates from your three sites. You will now categorize your sample, using the chart (other side) to help you identify the macroinvertebrates found. The number of animals found is not important; rather, the variety of species and how they are categorized tells us the biotic index score. Before you begin, check off the sites from which you collected your sample (see right).

- ☐ Riffle Sampling
- ☐ Snag Areas, Tree Roots, Submerged Logs
- ☐ Leaf Packs
- ☐ Undercut Banks

You should have removed large debris (e.g. leaves, rocks, sticks) from your sample and placed this material in a separate basin (after removing macroinvertebrates from it).

1. Check the basin with the debris to see if any aquatic macroinvertebrates crawled out. Add these animals to your prepared sample.
2. Fill the ice cube tray half-full with water.
3. Using plastic spoons or tweezers, (be careful not to kill the critters – ideally, you want to put them back in their habitat after you're finished) sort out the macroinvertebrates and place ones that look alike together in their own ice cube tray compartments. Sorting and placing similar looking macroinvertebrates together will help insure that you find all varieties of species in the sample.
4. Refer to the *Key to Macroinvertebrate Life in the River* and the *Citizen Monitoring Biotic Index* to identify the aquatic macroinvertebrates:
    A. On the back of this page, circle the animals on the index that match those found in your sample.
    B. Count the number of types of animals that are circled in each group and write that number in the box provided. Do not count individual animals in your sample. Only count the number of types of animals circled in each group. C. Enter each boxed number in work area below.
    D. Multiply the entered number from each group by the group value.
    E. Do this for all groups.
    F. Total the number of animals circled.
    G. Total the calculated values for all groups.
    H. Divide the total values by the total number of types of animals that were found: **TOTAL VALUES (b.) / TOTAL ANIMALS (a)**.
    I. Record this number.

SHOW ALL MATH (Use space below to do your math computations)

No. of animals circled from group 1 _____ x 4 = _____

No. of animals circled from group 2 _____ x 3 = _____

No. of animals circled from group 3 _____ x 2 = _____

No. of animals circled from group 4 _____ x 1 = _____

Total Animals (a): Total Value (b):

Divide totaled value (b)_____by total no. of animals (a) _____for index score:

Index Total

How Healthy is the stream?	
Excellent	3.6+
Good	2.6 - 3.5
Fair	2.1 - 2.5
Poor	1.0 - 2.0

Report your results online at **www.uwex.edu/erc/wavdb** *or submit your data to your local coordinator. Call your local monitoring coordinator if you have questions about sampling or determining the Biotic Index Score.*