Upham Woods Grab and Go: Wacky Water Critters

Concept: Become familiar with the macroinvertebrates that inhabit our natural waterways and be able to identify at least one.

Age level: 1st grade – 8th grade

Education Standards:
3-LS1-1 3-LS4-2 3-LS4-3 3-LS4-4 4-LS1-1 4-LS1-1 MS-LS2-2

Success Indicator:
Youth will be able to accurately identify wetland macroinvertebrates and classify them. Students will also define, identify and understand the importance of adaptations. Youth will also be able to describe and understand the process of metamorphosis.

Time: 1 hour

Space: Next to a body of water with a gentle slope or a dock above fresh water

Materials:
-Plastic tubs (1 tub/ 2 students)
-With each tub:
- -2 plastic spoons
- -2 petri dishes
- -1 magnifying glass
- -1 dip net
- -2 pipettes
- -1 Critter Adaptation Sheets
- -1 ice cube tray
- -1 laminated Branching Key
- -1 pencil

Background Information:

A macroinvertebrate is any invertebrate that can be caught using a 500 µm net or sieve. These creatures are large enough to see with the naked eye, but small enough to overlook if you're not actively searching for them. Aquatic macroinvertebrates are often found in Wisconsin waterways and many are the larval stages of other insects. Macroinvertebrates are extremely important to the ecosystem because not only do they provide food for things living in the water like fish, but they also give us indications of water quality in the areas they inhabit. For example, caddisflies and mayflies cannot live in polluted water, so finding these invertebrates in a waterway is a great sign that the water is good quality.

Metamorphosis is a process that animals undergo on their way into adulthood. Many macroinvertebrates endure the same extreme changes that you think of when you picture a tadpole turning into an adult frog. This lesson will ensure a better comprehension of those scientific processes as well as understanding the concept of adaptations in using a real world example. Investigating macroinvertebrates will compel students to ask questions and make better connections to these concepts.

Prior to the Program:

** This program can be conducted outside, weather permitting. If there is a chance of thunder or lightening, use a dip net to collect macroinvertebrates for your students to then explore inside the classroom. **

1. Choose a location where there is plenty of room between each station. Set up each station so that every item listed in the *Materials* section is present.

2. Fill the plastic tubs with water about 1/3 full so that youth don't run the risk of falling in or getting wet.

Teaching the Program:

1. Put students together in pairs and instruct them to walk carefully to their designated station. Explain that in the interest of time, each student may only dip the nets in the water two times. They will then flip the net inside out into the plastic bins in order to investigate the invertebrates that they captured.
Safety Check: To ensure that younger students don't fall in, instruct them to lay on their bellies while using the dip nets. This is especially important if the program is held on a dock.

2. Have the students fill one of the petri dishes halfway up and then gently use a plastic spoon or eyedropper to remove and further investigate one macroinvertebrate.

3. Instruct the students to attempt identifying the macroinvertebrate using the magnifying glass and laminated Branching Key sheet that is located at their stations.

Discussion Questions:

1. Can you remember the difference between invertebrates/ vertebrates? What are humans? What are the aquatic critters?

2. Do the larval insects we investigated today live in the water as adults?

3. What is an adaptation? What are some adaptations you can think of that organisms would need to live in the water?

4. Based on the amount of macroinvertebrates we found today, do you think our water is polluted? Why or why not?

5. Do you think you'll find this many insects in the water during winter? Why or why not?

6. Is there a place near your house where you could compare/ contrast our findings with an area closer to your home? What could be different or the same about the two locations?

Teaching the Program (Continued) :

4. **Checkpoint:** Ask students to share what creature they identified using their sheet. What characteristics are the same/ different about everyone's wacky water critter? Walk around to see everyone's unique critters!

5. Continue to allow the students to try and identify as many macroinvertebrates as they can within a given time period (using your discretion.)

6. When the students have accomplished identifying some of the macroinvertebrates, teach them about adaptations and how they help organisms survive in their specific habitats.

7. Have each team fill up an ice cube tray with water and "organize" the macroinvertebrates based on their similarities. Ask if any students would like to share their classification system with the class.

8. Have the students start carefully pouring their creatures back into the plastic bins and then back into the water. Remind them that we only borrowed them for the day and that they have to go back to their habitats.

9. Once everything is tidy, pass out pencils and one Adaptation Sheet per team. Have the students begin to fill that out and have them share their critter and a few facts about them.

Wrap Up:

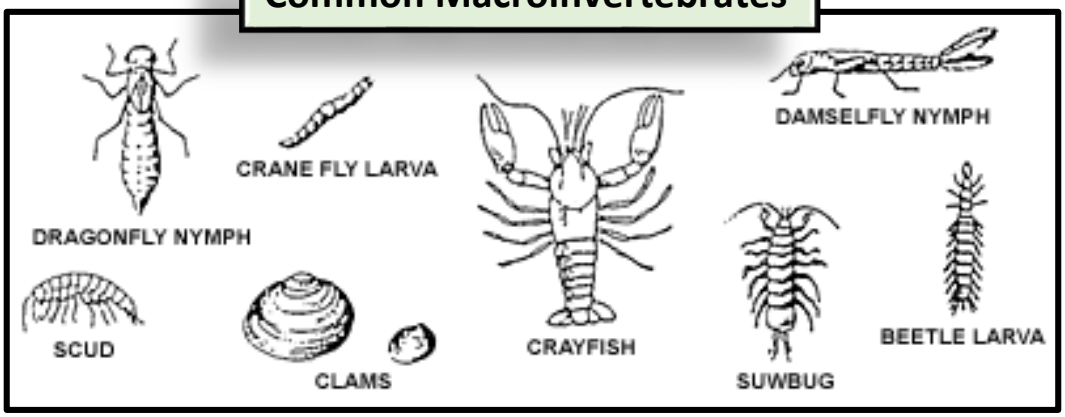
1. Have students share with you their favorite part of the day and one thing that they learned.

2. Ask students to describe in as much detail as possible, one adaptation that an aquatic macroinvertebrate possesses.

3. Ask them if they think the bugs in the water will turn into something else when they're adults and explain that all of the invertebrates you looked at today were "baby" insects. Explain the concept of metamorphosis.

4. Time permitting, have students draw one macroinvertebrate that they found during the program coupled with the adult version of the same macroinvertebrate.

Common Macroinvertebrates



…If You Have Extra Time

If you have time, play *Wetland Metaphors*! It compares household items to the role a wetland plays in the environment.

Sponge- Soaks up water and runoff
Pillow- Resting place for migratory birds
Strainer- Filters out toxins and pollutants
Soap- Cleans and purifies water
Bottle- Provides refuge for young wildlife

How many other household items can your group come up with?