Title: Tools of the Trade and How to Use Them

Site: Possible water sites to investigate and test – South Chagrin Reservation, Doan Brooke, Shaker Lakes, Chagrin River Sites such as Daniels Park or Todd Field in Willoughby, Cuyahoga River Watershed areas. Any stream, pond, or river near your school would make a great place to begin.

State Science Content Standards:
1. Summarize that organisms can survive only in environments in which their needs (e.g., food, water, air, and a way to dispose of waste) can be met. The world has different environments, and distinct environments support the life of different types of organisms.
2. Use simple instruments to make observations (rulers, thermometers, watches, magnifiers, calculators and other appropriate tools) and to conduct investigations and communicate findings.
3. Evaluate observations and measurements made by other persons, and identify reasons for any discrepancies.

Specific Lesson Objectives:
1. Teachers will use the photos and/or video clips of the tools, along with their descriptions, to gain the background information needed to assist students with the investigation of macro invertebrates and water quality of a stream or river.
2. Teachers will be able to discern which of the items will be used to collect macro-invertebrate specimens, and will be able to construct a few of the basic collection tools with their students.
3. Teachers will gain an overall understanding of the basic tools necessary to lead their students through an inquiry activity involving the stream and its inhabitants.

Materials: Materials are listed with individual descriptions. The following list of book titles can be helpful to begin a discussion with your students about water and its importance to all living things. These are appropriate for grades K - 5, and are just a few of the many available books.

Ecology for Every Kid by Janice VanCleave's
Life in Ponds and Streams by Leslie Jackman
Rivers and Lakes by Martyn Bramwell
Water by Sally Hewitt
The Magic School Bus: Wet All Over by Joanna Cole
Vocabulary:

1. Kick Seine
2. Net
3. Scrub brush
4. Ekman Dredge
5. Surber Square Foot Sampler
6. pH Test
7. Nitrate Test
8. Phosphorus Test
9. Styrofoam Ball and String
10. Ziploc Bags
11. Critter Containers
12. Clipboard, Pencil, Data Sheets, Taxa Guide
13. Meter stick
14. Calculator
15. Hand- Held Magnifier
16. Waste Chemical Jug
17. Thermometer
18. Microscope
19. Stopwatch
20. Plankton Net

Procedure:
Click on one of the words listed on the screen. Take a look at the photograph and play the video clip, if there is one to view. When you are finished viewing all 20 of the “Tools of the Trade”, you may go to the Student Inquiry Lesson Worksheet to assess your knowledge. The lesson presents a numbered photo of each of the tools. Students are asked to write down what they think the tool is (name it), and how they think it should be used when investigating a stream, river, or lake. Teachers can use the student worksheet as an introductory activity, or as a post-test for a stream study done by the class to assess their understanding of the equipment used and tests performed.

Background Information:
You may be interested in starting a Watershed Education Program in your school or classroom, or you may be looking for some hands-on inquiry based activities to support your current curriculum. Whatever your interests happen to be, it is important to develop a general knowledge base of the tools needed to collect and analyze real-life data from the water source that you wish to study. There are many excellent resources available that contain the information needed to get you started.

Suggested Web Sites:
Aquatic Ecosystems: www.boqueteriver.org/adoptaqecosys.html
Chagrin River Watershed Partners, Inc.: http://www.crwp.org
Earth Force: GREEN www.earthforce.org Email - green@earthforce.org
ExplorA-Pond: www.uen.org/utahlink/pond
Local Soil and Water Conservation District: http://dnr.state.oh.us and navigate to "SWCD's of Ohio"
Local Soil and Water Conservation District: http://dnr.state.oh.us
Stream Corridor Restoration: http://www.usda.gov/stream restoration
The Adventures of Science Bob: www.sciencebob.com