

K-12 Water Education Materials

(Curriculum/activity guides, audio tapes, videos, children's books, references, equipment, posters)

May be borrowed from Western UP Center for Science, Mathematics & Environmental Education
Michigan Tech Office: (906)487-3341 or jchadde@mtu.edu CCISD Office: (906)482-0331 or loret@copperisd.org

Curriculum/Activity Guides

<u><i>Acid Rain Teacher's Guide</i></u> by Lawrence Hall Science (LHS) Gems Covers acids, bases, pH, ecosystems, and the effects of acid rain	Grades 6-10
<u><i>Children's Groundwater Festival Outreach Packet</i></u> A packet of teacher materials, lesson plans, student worksheets and resources for conducting water festivals	Grades 1-6
<u><i>Classroom GEMS (Groundwater Education in Michigan Schools) - Elementary</i></u> Activities and resources for groundwater education	Grades K-6
<u><i>Engineering is Elementary – Water Filtration</i></u> http://www.mos.org/eie/units.php	Grades 1-6
<u><i>Field Manual for Water Quality Monitoring</i></u> by William Stapp Describes student data collection and analysis of nine water quality parameters; sources of water pollution; how to solve water quality problems.	Grades 7-12
<u><i>Groundwater Education in Michigan Schools (GEMS)</i></u> 23 activity lesson plans, teacher background & student worksheets for water/groundwater	Grades K-6
<u><i>Hands-On Nature</i></u> by Jenepher Lingelbach, Vermont Institute of Science Information and activities for exploring the ponds, streams, and other outdoor environments with children	Grades K-6
<u><i>Lake Effects: The Lake Superior Guide</i></u> by the Lake Superior Center Background information and activities about Lake Superior	Grades K-12
<u><i>Making Waves</i></u> A detailed "how-to" & useful tips for putting on a water festival	Grades K-12
<u><i>Making A Bigger Splash</i></u> A collection of Water Education and Festival Activities	Grades K-6
<u><i>Michigan Environmental Education Curriculum Unit Support– Water Quality</i></u> 9 lessons, video, CD, maps, posters, aerial photos. http://wupcenter.mtu.edu/education/ecosystem_curriculum_units/index.html	Grades 6-8
<u><i>Michigan WISE (Waste Information Series for Education)</i></u> Background information, and activities/lessons in units organized for grades K-3, 4-6, 7-9, and 10-12	Grades K-12
<u><i>Pond and Stream Safari: A Guide to the Ecology of Aquatic Invertebrates</i></u> Excellent resource and activities for pond and stream studies	Grades 6-12
<u><i>Project WET (Water Education for Teachers)</i></u> Activities to teach about all aspects of water through science, math, language arts, art, & music	Grades K-10
<u><i>Project WILD—Aquatic</i></u> Curriculum/activity guide that teaches about wildlife & water	Grades K-12
<u><i>River Cutters Teacher's Guide</i></u> by LHS GEMS Information and activities on erosion, geologic events, pollution, and human effects on the environment	Grades 6-9
<u><i>Rivers Curriculum Guide: Biology</i></u> by Rivers Curriculum Project (RCP) Explores the diversity of plant and animal life along rivers; uses benthic macroinvertebrates as the primary indicator of a river's health)	Grades 9-12
<u><i>Rivers Curriculum Guide: Chemistry</i></u> by RCP Describes the nine water-quality tests used to assess stream health; links water-quality test procedures to basic chemical principles students study in class	Grades 9-12
<u><i>Rivers Curriculum Guide: Earth Science</i></u> by RCP Provides information and activities on how to use the physical features of a river to discern important clues about a river's geological development)	Grades 9-12
<u><i>Rivers Curriculum Guide: Geography</i></u> by RCP Describes how the Earth's surface is occupied and organized using the five themes of geography: location, place, movement, regions, and human-environment interactions	Grades 9-12
<u><i>Science Book of Water</i></u> by Neil Ardley	Grades K-3

Contains variety of water experiments	
<u>Streamkeeper's Field Guide</u>	Grades 7-12
Watershed inventory & stream monitoring methods	
<u>Water Precious Water</u> by AIMS Activities	Grades 2-6
Collection of elementary water activities	
<u>Watershed Science for Educators</u> by Cornell Extension	Grades 7-12
"How to" for designing a stream investigation including: selecting stations, using aerial photos and topographic maps to delineate the watershed, collect and interpret data from chemical, biological and physical stream assessments.	
<u>WOW! The Wonders of Wetlands</u>	Grades K-10
Activities to teach about all aspects of wetlands	
Children's Trade Books	
<u>Come Back, Salmon</u> by Molly Cone	Grades 1-6
How a group of dedicated kids adopted Pidgeon Creek and brought it back to life	
<u>A Drop of Water</u> by Walter Wick	Grades 6-12
Spectacular photos, simple text about evaporation, condensation, capillary attraction and surface tension	
<u>Flush: Treating Wastewater</u> by Karen Mueller Coombs	Grades 6-9
A history of waste disposal, water treatment operations, lots of pictures, good examples	
<u>Follow the Water from Brook to Ocean</u> by Author Dorros	Grades K-4
Explores water's journey, how it shapes the earth, and why it is important to keep it clean	
<u>Henry Goes Underground</u> by Patricia Chilton-Stringham	Grades K-3
Understanding groundwater	
<u>Lake Superior</u> by Ann Armbruster	Grades 2-5
History of Lake Superior	
<u>Letting Swift River Go</u> by Jane Yolen	Grades K-4
Discusses the destruction of homes to create a reservoir for a large city	
<u>The Magic School Bus: At the Waterworks : Water treatment</u> by Joanna Cole	Grades K -4
<u>The Magic School Bus: Wet All Over</u> by Joanna Cole	Grades K-4
<u>Marshes & Swamps</u> by Gail Gibbons	Grades K-4
Information on marshes swamps and their importance to nature	
<u>McElligot's Pool</u> by Dr. Seuss	Grades K-3
A child patiently waits to catch a fish despite all of the reasons why fish might not be there...	
<u>A New True Book: Water Pollution</u> by Darlene R. Stille	Grades 4-6
How we use water and how pollution affects lakes and oceans	
<u>A New True Book: Wetlands</u> by Emilie U. Lepthien and Joan Kalbacken	Grades 4-6
Defines different types of wetlands, where they're found, wildlife uses, pollution, and laws	
<u>Oil Spill!</u> by Melvin Berger	Grades K-4
Discusses how oil spills occur, how they are cleaned up, and how they can be prevented; specifically the Exxon-Valdez spill	
<u>One Small Square: Pond</u> by Donald M. Silver	Grades K-4
Visiting a pond from a child's perspective	
<u>Paddle-To-The-Sea</u> by Holling C. Holling	Grades K-4
A toy wooden canoe's journey from Lake Superior to the Atlantic Ocean	
<u>Peter's Place</u> by Sally Grindley	Grades K-3
Peter tries to help animals in an oil spill	
<u>The Rainstick: A Fable</u> by Sandra Chisholm Robinson	Grades 2-6
A fable about a West African boy's quest for rain; includes instructions for making rain sticks	
<u>The Salamander Room</u> by Anne Mazer	Grades Pre-4
Describes a salamander's habitat in a fun way	
A fun, colorful beginning book about water	
<u>Water</u> by Francois Michel	Grades K-6
An amazing pop-up, pull-tab, lift-the-flap guide to all aspects Water--groundwater, streams, floods, drinking water, and more	
<u>Water Dance</u> by Thomas Locker	Grades K-4

Poems and Pictures about water
Where the River Begins by Thomas Locker **Grades K-4**
 Two boys follow a river to its beginning

Science Supplies & Equipment

Sampling Kit for Streams, Ponds and Wetlands **Grades K-10**
 Contains nets, magnifiers, tubs and other items for collecting and identifying aquatic organisms

Dripial Pursuit **Grades 6-12**
 Patterned after "Trivial Pursuit" using water-related words

Stencils for Storm Drain Stenciling **Grades 6-12**
Enviroscape All ages

2 x 2 ft tabletop model that demonstrates non-point sources of pollution:
 sediment, fertilizers, road salt, used motor oil, etc.

Groundwater Flow Model All ages

Tabletop model of where groundwater is found; shows how groundwater can be
 polluted by landfills, underground storage tanks, and other sources using dye;
 illustrates connection between surface and groundwater

"Investigating Groundwater: The Fruitvale Experience" **Grades 7-10**

A hands-on classroom activity that demonstrates the effects of groundwater
 contamination; students test 40 samples of "well water" & map a groundwater
 contamination plume

Puddle Pictures **Grades 1-5**

Patterned after "Pictionary" using water-related words

Stream Ecology Leaf Pack Experiment Kit by lame Company **Grades 6-12**

Contains materials to conduct a variety of experiments on the role of leaves in
 streams, and how to assess habitat and water quality for stream macroinvertebrates

Stream Macroinvertebrate Flashcards **Grades 6-12**

Set of 18 laminated color illustrations of major stream/pond macroinvertebrates

Waste Hierarchy: Where Is Away?" **Grades 7-12**

Hands-on classroom activities address the four levels of waste treatment practices:
 landfills, incineration, reuse/recycle, and source reduction

LaMotte Water Chemistry Test Kits : DO, pH, P, N, turbidity, iron, copper **Grades 7-12**

CDs (Audio)

Excuse Me Sir, That's My Aquifer 30 min. **Grades K-6**

Songs about groundwater

Frogs & Toads of Michigan 13 min. **Grades 3-12**

Contains songs/calls of Michigan's 13 species of frogs & toads

Nature Nuts 58 min. **Grades K-6**

Science & ecology songs including "Romp in the Swamp", "Garbage Man",
 "Recycle Blues", "Don't Throw It Away."

Videos/DVDs

After the Rain by U.S. EPA & Weather Channel . 29 min. **Grades 6-12**

Explores importance of water, the pressures our cities are placing on this precious
 resource, and ways to protect local drinking water supplies.

Aquatic Invertebrates and Water Quality 7 min. **Grades 6-12**

Role of stream macroinvertebrates in the aquatic ecosystem and how they are used
 as water quality indicators

Down the Drain 30 min., 3,2,1 Contact Series **Grades 4-8**

Good lesson on the water properties and the water cycle-- also talks about water
 usage, pollution, and treatment

Headwaters: The Lifeline of a River (28 min) Sponsored by Rouge River Watershed **Grades 6-12**

Council and SE Michigan Water Quality Board. Introduces issues of headwater protection.

It's Found Underground 31 min. **Grades 3-5**

Describes the water cycle, water table, permeability, and groundwater contamination

<u><i>Life of the <Great> Lakes</i></u> 58 min. Story of the world's greatest freshwater fishery	Grades 5-12
<u><i>Michigan's Drinking Water--- Safe, Reliable, and Abundant</i></u> 10 min. Municipal treatment and delivery	Grades 3-9
<u><i>Michigan's Great Lakes Coastal Zone - Part 1: Threatened and Endangered Species</i></u> 22 min. Discusses the peregrine falcon, eagle, trumpeter swan, and osprey	Grades 4-9
<u><i>Michigan's Great Lakes Coastal Zone- Part 2: Agriculture, Recreation, Fishing</i></u> 17 min. Discusses the unique coastal zones of the Great Lakes and how they are used for agriculture, recreation, and fishing	Grades 4-9
<u><i>Michigan's Great Lakes Coastal Zone - Part 3: Commercial Shipping, Industrial Development, Habitat Restoration</i></u> 20 min. Discusses how industry in Michigan has impacted natural habitats and how the damage is being corrected now; shows the restoration of a wetland	Grades 4-9
<u><i>Our Valuable Wetlands Resource</i></u> by Tip of the Mitt Watershed Council 27 min. Focuses on how to identify the basic types of wetlands in the Great Lakes Basin, and the values of wetlands	Grades 7-12
<u><i>Rise and Fall of the Great Lakes</i></u> 12 min. Produced by Canadian Film Board. Satire on the origins and current fate of the Great Lakes.	Grades 6-12
<u><i>SOS for American Streams</i></u> by Izaak Walton League 28 min. Water quality monitoring techniques	Grades 5-12
<u><i>Thousand Friends of Frogs</i></u> 10 min. Minnesota news reports about the students who found the deformed frogs and brought the frog deformity issue to national attention. Students express their concerns and Minnesota Water Pollution Control scientists explain their research efforts to understand the problem.	Grades 4-12
<u><i>Torch Lake: An Area of Concern</i></u> 18 min. Explanation of Torch Lake as a superfund site, good area history lesson	Grades 7-12
<u><i>We All Live Downstream</i></u> Identifies point and non-point sources of water pollution in a watershed, with special emphasis on the Tualatin River in Oregon	Grades 7-12
<u><i>The Wealth of Wetlands</i></u> 23 min. Value of wetlands from different property owners' perspectives; restoration methods	Grades 9-12

Reference Books

<u><i>Aquatic Entomology</i></u> by W. Patrick McCafferty Illustrated guide to aquatic insects and their relatives.	Grades 6-12
<u><i>How to Know the Aquatic Insects</i></u> by Dennis Lehmkuhl Provides a key to Aquatic Insect Orders and Families, morphology of insects, and use of aquatic insects as pollution indicators.	Grades 6-12
<u><i>Great Lakes: An Environmental Atlas and Resource Book</i></u> by U.S. EPA Outstanding compilation of information and maps about the Great Lakes	Grades 5-12
<u><i>Water Quality Indicators Guide: Surface Water</i></u> USDA Examines agricultural related nonpoint source pollution, how to identify pollutants, and recommends best management practices (BMPs) to reduce or eliminate pollution	Grades 7-12

Classroom Posters

<u><i>Eat Or Be Eaten At The Wetland Cafe</i></u> Perfect for laminating as a placemat, for a daily reminder of food chains; EPA & TVA	Grades K-2
<u><i>The Water Cycle: Nature's Recycling System</i></u> USDA & Water Environment Federation	Grades 4-9
<u><i>Where Land Meets Water: Soil Erosion and Sedimentation</i></u> Great Lakes Commission http://www.glc.org/basin/pubs/wlmw.html	Grades 4-9
<u><i>Great Lakes Basin Map (and maps of each Great Lake)</i></u> Michigan Sea Grant http://www.miseagrant.umich.edu/store	Grades 6-12