## K-12 Water Education Materials

(Curriculum/activity guides, Audio tapes, videos, children’s books, references, equipment, posters)

**May be borrowed from Center for Science & Environmental Outreach**

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### Curriculum/Activity Manuals

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

Water Precious Water by AIMS Activities
Collection of elementary water activities

Watershed Science for Educators by Cornell Extension
“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.

WOW! The Wonders of Wetlands
Activities to teach about all aspects of wetlands

Science Equipment
Sampling Kit for Streams, Ponds and Wetlands
Contains nets, magnifiers, tubs and other items for collecting and identifying aquatic organisms

Dripial Pursuit
Patterned after “Trivial Pursuit” using water-related words

Stencils for Storm Drain Stenciling

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

Groundwater Flow Model
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 Fruitvalve Experience”
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
Patterned after “Pictionary” using water-related words

Stream Ecology Leaf Pack Experiment Kit by lame Company
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
Set of 18 laminated color illustrations of major stream/pond macroinvertebrates

Waste Hierarchy: Where Is Away?”
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

Audio Cassette Tapes
Excuse Me Sir, That’s My Aquifer 30 min.
Songs about groundwater

Frogs & Toads of Michigan 13 min.
Contains songs/calls of Michigan’s 13 species of frogs & toads

Nature Nuts 58 min.
Science & ecology songs including "Romp in the Swamp", "Garbage Man", "Recycle Blues", "Don't Throw It Away."

Videos
After the Rain by U.S. EPA & Weather Channel 29 min.
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.
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
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 Council and SE Michigan Water Quality Board. Introduces issues of headwater protection. Grades 6-12

*It's Found Underground* 31 min.

Describes the water cycle, water table, permeability, and groundwater contamination Grades 3-5

*Life of the <Great> Lakes* 58 min.

Story of the world's greatest freshwater fishery Grades 5-12

*Michigan's Drinking Water--- Safe, Reliable, and Abundant* 10 min.

Municipal treatment and delivery Grades 3-9

*Michigan's Great Lakes Coastal Zone - Part 1: Threatened and Endangered Species* 22 min. Discusses the peregrine falcon, eagle, trumpeter swan, and osprey Grades 4-9

*Michigan's Great Lakes Coastal Zone- Part 2: Agriculture, Recreation, Fishing* 17 min. Discusses the unique coastal zones of the Great Lakes and how they are used for agriculture, recreation, and fishing Grades 4-9


Discusses how industry in Michigan has impacted natural habitats and how the damage is being corrected now; shows the restoration of a wetland Grades 7-12

*Our Valuable Wetlands Resource* 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 6-12

*Rise and Fall of the Great Lakes* 12 min. Produced by Canadian Film Board.

Satire on the origins and current fate of the Great Lakes. Grades 5-12

*SOS for American Streams* by Izaak Walton League 28 min.

Water quality monitoring techniques Grades 4-12

*Thousand Friends of Frogs* 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 7-12

*Torch Lake: An Area of Concern* 18 min.

Explanation of Torch Lake as a superfund site, good area history lesson Grades 7-12

*We All Live Downstream*

Identifies point and non-point sources of water pollution in a watershed, with special emphasis on the Tualatin River in Oregon Grades 9-12

*The Wealth of Wetlands* 23 min.

Value of wetlands from different property owners' perspectives; restoration methods

**Children's Books**

*Come Back, Salmon* by Molly Cone

How a group of dedicated kids adopted Pidgeon Creek and brought it back to life Grades 1-6

*A Drop of Water* by Walter Wick

Spectacular photos, simple text about evaporation, condensation, capillary attraction and surface tension Grades 6-12

*Flush: Treating Wastewater* by Karen Mueller Coombs

A history of waste Disposal, water treatment operations, lots of pictures, good examples Grades 6-9

*Follow the Water from Brook to Ocean* by Author Dorros

Explores water's journey, how it shapes the earth, and why it is important to keep it clean Grades K-4

*Henry Goes Underground* by Patricia Chilton-Stringham

Understanding groundwater Grades K-3

*Lake Superior* by Ann Armbruster

History of Lake Superior Grades 2-5

*Letting Swift River Go* by Jane Yolen

Discusses the destruction of homes to create a reservoir for a large city Grades K-4

*The Magic School Bus: At the Waterworks : Water treatment* by Joanna Cole Grades K-4

*The Magic School Bus: Wet All Over* by Joanna Cole Grades K-4

*Marshes & Swamps* by Gail Gibbons

Information on marshes swamps and their importance to nature Grades K-4
McElligot’s Pool by Dr. Seuss  
A child patiently waits to catch a fish despite all of the reasons why fish might not be there...

A New True Book: Water Pollution by Darlene R. Stille  
How we use water and how pollution affects lakes and oceans

A New True Book: Wetlands by Emilie U. Leptien and Joan Kalbacken  
Defines different types of wetlands, where they’re found, wildlife uses, pollution, and laws

Oil Spill by Melvin Berger  
Discusses how oil spills occur, how they are cleaned up, and how they can be prevented; specifically the Exxon-Valdez spill

One Small Square: Pond by Donald M. Silver  
Visiting a pond from a child’s perspective

Paddle-To-The-Sea by Holling C. Holling  
A toy wooden canoe’s journey from Lake Superior to the Atlantic Ocean

Peter’s Place by Sally Grindley  
Peter tries to help animals in an oil spill

The Rainstick: A Fable by Sandra Chisholm Robinson  
A fable about a West African boy’s quest for rain; includes instructions for making rain sticks

The Salamander Room by Anne Mazer  
Describes a salamander’s habitat in a fun way

Water by Francois Michel  
An amazing pop-up, pull-tab, lift-the-flap guide to all aspects Water—groundwater, streams, floods, drinking water, and more

Water Dance by Thomas Locker  
Poems and Pictures about water

Where the River Begins by Thomas Locker  
Two boys follow a river to its beginning

Reference Books:

Aquatic Entomology by W. Patrick McCafferty  
Illustrated guide to aquatic insects and their relatives.

How to Know the Aquatic Insects by Dennis Lehmkuhl  
Provides a key to Aquatic Insect Orders and Families, morphology of insects, and use of aquatic insects as pollution indicators.

Great Lakes: An Environmental Atlas and Resource Book by U.S. EPA  
Outstanding compilation of information and maps about the Great Lakes

Water Quality Indicators Guide: Surface Water USDA  
Examines agricultural related nonpoint source pollution, how to identify pollutants, and recommends best management practices (BMPs) to reduce or eliminate pollution

Classroom Posters:

Eat Or Be Eaten At The Wetland Cafe  
Perfect for laminating as a placemat, for a daily reminder of food chains; EPA & TVA

The Water Cycle: Nature’s Recycling System  
USDA & Water Environment Federation

Where Land Meets Water: Soil Erosion and Sedimentation  
Great Lakes Commission  http://www.glc.org/basin/pubs/wlmw.html

Great Lakes Basin Map (and maps of each Great Lake)  
Michigan Sea Grant  http://www.miseagrant.umich.edu/store