



Michigan's Environmental Education Curriculum Support (MEECS)

Water Quality Unit

Tuesday, Feb. 16, 2010
Copper Country ISD, Conference Room B
8:30 a.m. – 3:00 p.m.

The Water Quality Unit is designed for grades 6-9, but can easily be adapted for high school classes. The unit includes 9 lessons that can be taught singly, or build one upon the other to provide a comprehensive look at Michigan's rivers, streams, groundwater, Great Lakes, watersheds, and more. Students discover the essential role that water plays in Michigan's economy and our lives, consider direct and indirect uses of water, investigate how land uses can impact water quality, explore characteristics of healthy streams, propose ways to reduce storm water runoff, and investigate challenges to the Great Lakes. Students consider "How can we care for the Great Lakes?" (Limit 20 participants)

FREE Classroom Materials for Workshop Participants

Every curriculum unit includes:

- Notebook of lesson plans and hands-on activities.
- Background information for teachers
- CD with extension lessons, PowerPoints, and more.
- Pre- & Post-Tests and other assessments
- Student materials & colorful posters



Credit Available: 0.5 SB-CEUs available.

Workshop Cost: Lunch and curriculum materials FREE to classroom teachers.

MEECS Water Quality Workshop Registration Form

NAME _____ SCHOOL _____ Grade Level _____

EMAIL _____ PHONE _____

Please send registration form to:

Loret Roberts
809 Hecla Street
Hancock, MI 49930

Email: loret@copperisd.org
Fax: 906-482-1931

REGISTRATION DEADLINE: Wed., Feb. 10, 2010

Sponsored by the Lake Superior Stewardship Initiative, which is part of the Great Lakes Stewardship Initiative established by the Great Lakes Fishery Trust with the support of the Wege Foundation.



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Lake Superior Stewardship Initiative
<http://lakesuperiorstewardship.org/>



Michigan Environmental Education Curriculum Support ~ Water Quality Unit

Essential Questions	Core Lesson
Where is water found on Earth? How does water move on Earth? Is there enough water on Earth for everyone? Why are the Great Lakes unique?	1. Where Is All the Water in the World? – Students describe how water moves through the water cycle, where water is located on Earth, and how much fresh water is available for human use.
Why is clean, fresh, available water so important to humans? What are direct and indirect uses of water? How would having less water or more expensive water affect Michigan residents?	2. How We Use Water – Students identify the many ways we use water both directly for household activities, and indirectly in everything we consume. Students calculate their weekly water use and its cost compared to gasoline, and consider how water is an essential component of Michigan’s economy and environment.
What is a watershed? Why care about watersheds? How does water in your watershed reach the Great Lakes? Why does the amount of stream flow differ between Michigan streams and for different months of the year?	3. Do You Know Your Watershed? – Students define watershed and the parts of a river; compare watershed size and stream flow in Michigan; examine their watersheds’ relationship to the Great Lakes.
How does what we do on the land affect water quality? How does pollution get from one place to another? How can I learn about water pollution in my watershed?	4. How Do Land Uses Affect Water Quality? – Students build a simple watershed model to observe point & non-point pollution from different land uses; identify the types of pollution resulting from different land uses; give examples of best management practices to reduce pollution; and identify potential sources of water pollution in their watersheds.
How is groundwater connected to surface water? How does groundwater move? How can groundwater become polluted? Is there enough groundwater for all Michigan uses?	5. Why Care About Groundwater? – Students explore groundwater movement, how groundwater interacts with surface water, and groundwater uses in Michigan. Student build a model to see how groundwater can be pumped and recharged, and use Michigan data to explore how groundwater can be contaminated.
How do we know our water is safe to drink? What units are used to measure water pollution? Has our water always been clean? Who is responsible for protecting our drinking water?	6. Would You Drink This Water? – Students consider whether the ‘look’ and ‘smell’ of water is enough to indicate its quality; conduct a serial dilution to observe the tiny quantities that can be harmful to humans and aquatic organisms; and become familiar with who protects Michigan’s water quality.
What is stream monitoring, and how is it done? How do you know if a stream is healthy? What are bioindicators? What makes good habitat for fish?	7. How Healthy Is This Stream? – Students identify characteristics of healthy streams and use real Michigan data to evaluate four streams for the presence of pollution-sensitive bioindicator organisms, appropriate habitat, and good water quality in order to select the best stream for planting brook trout.
Where does storm water come from and where does it go? What are potential contaminants in runoff? How do people affect the quantity and quality of runoff? How can communities grow without impacting aquatic ecosystems? How is storm water runoff different in urban areas versus rural areas?	8. How Can We Stop Storm Water? – Identify pollutants in storm water; use aerial photos to compare changes in land use and runoff quantity; identify best management practices to reduce storm water impacts.
Are the Great Lakes really great? Can I eat fish from the Great Lakes? What types of contaminants are found in the Great Lakes? How can I help protect the Great Lakes?	9. Bioaccumulation and the Great Lakes Ecosystem – Students investigate the source and pathways for bioaccumulation of contaminants in Great Lakes food chains; identify locally contaminated rivers using the Michigan Family Fish Consumption Guide; and answer the question, “How can I help the Great Lakes?”

What is the Michigan Environmental Education Curriculum Support (MEECS) Project?

MEECS consists of five units for grades 4-9 students---Ecosystems & Biodiversity, Land-Use, Water Quality, Energy Resources, and Air Quality--- which support Michigan’s science and social studies Grade Level Content Expectations. Units contain 7-9 lessons which are Michigan-specific, hands-on, and inquiry-based.