

SOURCE WATER CURRICULUM ASSESSMENT EXAMPLE

Adopt A Watershed – Wade Into Watersheds curriculum for grades 4-5

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March 2001

“Wade Into Watersheds” is a high quality, thorough introduction to watershed components for grades 4-5. This review provides brief recommendations for modifying this AAW module to meet needs identified for source water education. In the chart below, I have provided detailed comments in relation to the University of Wisconsin’s recommendations developed through a 6 month study funded, in part, by US EPA Office of Water.

“Wade Into Watersheds” focuses on aquatic habitat and ecosystems with some reference to human activities and impacts. To meet source water education needs, this module will need to be modified in several ways. This version provides such a rich collection of concepts, that the source water concepts don’t stand out. [A suggestion is to leave out activities: 3, 6, 10 and 11 which distract attention from the drinking water focus.] It is also too long to assure that it would be used to meet source water education needs. In addition several major topics are completely missing. Materials should be designed so that teachers are able to build source water education into any number of classroom units and, at the end of the unit, students should be able to articulate what they have learned specifically about source water.

Overall, I recommend using many of the activities as a foundation to a new version, providing a shorter set of activities more focused on source water education. The new version should clearly emphasize: the main issues for drinking water, a focus on the sources of drinking water, and a focus on the contaminants and protection of drinking water. An excellent source for content and ideas regarding topics missing in this module can be found in “Watershed Connections” developed by Natalie Carroll to complement Purdue Cooperative Extension materials (sample sections enclosed in the mailed packet). You may want to invite Dr. Carroll to get involved in the development of the final project. Also see the many other curricula identified as part of the Source Water Education gap analysis report provided by the University of Wisconsin.

Some questions that sprang to mind as I reviewed “Wade Into Wetlands” follow:

Lesson 1 asks – what is the quality of the water in our watershed?

It was hard for me to tell how students would know how to answer this question. Students will need to be able to address: quality of water – for what uses? What do we mean by quality? When is something “good quality?” When is it “bad quality?” How do living things use water in the watershed and what quality of water is needed for each use? Water that is good enough quality for swimming or boating, may not be good enough quality to drink.

Are grades 4-5 the appropriate grades for introducing the Consumer Confidence Report? Really understanding the implications of the CCR requires some understanding or appreciation of chemistry. Do students in grades 4-5 have the background? Will this have any meaning for them? If you want to maintain the grade 4-5 focus, is there another way to introduce the chemistry aspect to make it more meaningful?

The following charts provide topic by topic comments for the student activities and leader guide. Comments below indicate presence or absence of attention to a particular topic. There is no need for a curriculum to address all of these concepts, but a successful curriculum will address most.

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SOURCE WATER EDUCATION ACTIVITIES	
University of WI – Environmental Resources Center report suggestions	Wade into Watersheds Student Activities
An activity simulating the “big picture” of the source water cycle from acquisition through treatment and consumer consumption to discharge of treated water back into a water ecosystem.	Lessons 1, 2, 4, 5 If activities are designed to emphasize drinking water sources.
An activity to identify and define source water, and source water areas.	Lessons 4 and 5 could be adapted to accomplish this goal.
Activity to enable student to <i>interpret CCR information</i> : • Identification of the sources of local drinking water.	Lessons 4 and 5 could be adapted to accomplish this goal, but needs a specific activity.
An activity to identify the watershed(s) in which the community is located.	Lessons 2, 4, 5, 13
An activity to identify storage areas for local source water.	* Needs a specific activity.
A survey of possible sources of source water pollution in the community.	Lesson 2 introduces the concept. Lessons 4 and 5 could be adapted if students conducted a community survey or used community photos. Lesson 14 – if adapted/focused
Activity to enable student to <i>interpret CCR information</i> : • The probable source of a contaminant.	* Needs a specific activity to provide a focus for learning this skill.
Activity to enable student to <i>interpret CCR information</i> : • Susceptibility to contamination of the sources of local drinking water.	Probably needs a specific activity. Lessons 7 and 12 could address some aspects if adapted. Needs attention to the role of soils – vulnerability of groundwater to contamination.
An activity to identify contaminants in the local water supply.	Lesson 9 – but needs additional time or activity to make the chemical portion meaningful.
Activity to enable student to <i>interpret CCR information</i> : • The level of contaminants in the local water supply, and a comparison with EPA’s health-based maximum contaminant level.	Lesson 9 – but needs additional time or activity to make the chemical portion meaningful.
An activity to study methods of treating contaminated source water.	Lesson 8
An investigation into the effects of water quality on food sources and human health.	* Needs a specific activity. * Needs an activity on human health issues. This is introduced in Lesson 1, but could be built on leading to Activity 15.
Activity to enable student to <i>interpret CCR information</i> : • Potential health effects if a violation has occurred.	* Needs a specific activity.
Activity to enable student to <i>interpret CCR information</i> : • If detected in the water, information on radon and <i>Cryptosporidium</i> .	* Needs a specific activity.
An activity to investigate environmental and economic costs of creating new or supplementary municipal water systems.	* Needs a specific activity.

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SOURCE WATER EDUCATION ACTIVITIES	
An activity to give students an opportunity to imagine and/or practice strategies for a source water contamination emergency.	* Needs a specific activity.
An exploration into how source water availability and contamination might be affected by the interrelationship between personal lifestyle, socioeconomic status, culture, population growth, and water accessibility.	Lesson 13 Lessons 14-16 if adapted/focused could address one or more of these topics.
An activity exploring the role of legislation in source water protection.	* Needs a specific activity
An activity where students can practice or suggest individual opportunities for source water protection actions on a community, state, or federal level.	Lessons 14-16 if adapted/focues
Activity to enable student to <i>interpret CCR information</i> : • Information on any completed Source Water Assessments (SWA), and the means in which to obtain a copy.	Activity 5, Extension

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DRINKING WATER SOURCES – LEADER GUIDE INFORMATION	
Univ of WI – Environmental Resources Center report suggestions	Wade into Watersheds Leader Guide
Background information, goals and objectives, activities and associated timeline, materials list for activities, resource identification, glossary, and assessment strategies.	Present
Information on accessing the local Consumer Confidence Report . Incorporation of CCR information into the structure and knowledge base of the information and activities in the education packet.	Largely missing, particularly the link to human health There is some information in Lesson 9
Reference material for background information that is needed by students and educators in order to comprehend the scientific concepts integral to learning about source water. Background topics include: <ul style="list-style-type: none"> • Physical and chemical properties of water • The hydrologic cycle • The percentage of fresh water on the Earth available for drinking • Types of water related ecosystems • Soil composition and structure 	Partially available. Needs more background information on drinking water availability, sources, etc.
A curriculum template which describes the source water “big picture” through identification of the six key source water topics: <ul style="list-style-type: none"> • Identification of drinking water sources. • Geohydrology: Dynamics of source water. • Accessing, storing, treating, and distributing source water. • Contamination, risk assessment, and remediation of source water. • Protection and/or prevention activities and programs of citizens, communities, and the Government. • Present and future needs for safe source water. 	Largely missing.
A list of previously evaluated resources providing source water activities in the areas of: <ul style="list-style-type: none"> • The physical and chemical properties of water. • The hydrologic cycle. • The percentage of fresh water on the Earth available for drinking. • Types of water related ecosystems. • Soil composition and structure. 	See the UW materials to add to resources already listed – to provide resources that are more specifically focused on drinking water
Suggestions for how to incorporate technology into activities and information acquisition, and/or suggest resources that can help this process.	The reference to the EPA web site, geo positioning could be emphasized more
A correlation of activities with National Science Education Standards.	Present
A student assessment through a home, school, or community based source water action project.	Present