

Supplement to “WET & WILD” Wesselman Nature Society Program

Written by USI Preservice Teachers

Title of lesson or book used: Water Quality	Date: Pre- and Post-Field Trip
Materials: <ul style="list-style-type: none">• News articles/Magazine articles• Yellow Pages of a phone book• A large bucket (5 gallon)• Containers (1 for each student)• 17 Large household sponges• (4 whole, 3 cut into ¼, 5 cut into 1/3, 5 cut into ½)• Various colors of food coloring• Markers• Poster Board	Content Standards: Target Audience: Middle School Science <ul style="list-style-type: none">• 6.2.8 - Analyze and interpret a given set of findings, demonstrating that there may be more than one good way to do so.• 6.3.8 - Explain that fresh water, limited in supply and uneven in distribution, is essential for life and also for most industrial processes. Understand that this resource can be depleted or polluted, making it unavailable or unsuitable for life. English/Language Arts <ul style="list-style-type: none">• 6.5.5 - Write persuasive compositions that:<ul style="list-style-type: none">• state a clear position on a proposition or proposal.• support the position with organized and relevant evidence and effective emotional appeals.• anticipate and address reader concerns and counterarguments
Resources: <ul style="list-style-type: none">• http://www.wesselmannaturesociety.org/educators/index.php (To provide students with clarification about what they will see and ecosystem of Wesselman Woods)• http://www.epa.gov/watersense/water/drop.html (Environmental Protection Agency website with information on water and pollution’s implications on habitat use)	
Objectives: After instruction the students will be able to illustrate how multiple users of water resources can affect water quality and examine the complexities of providing water for all users, as evidenced by the proposals and/or illustrations of ways communities could supply its members with clean and ample water supplies.	

Introduction/Motivation:**Pre-Field Trip Activity**

- With a large class discussion, have students list major water user groups in their community and how they use water. Create a two column chart with column 1 as community members and column 2 as use of water
- Ask students to arrange the water users from those who use the most water to those who use the least (could use attached 2 column chart at their desks in small groups)
- Have students reflect on how different organisms use water relative to their size and behaviors (e.g., impact of habitat, characteristics of living organisms, etc.)

Procedure/Activity:

Before the field trip, allow approx. 50 minutes for this activity.

- Fill the large bucket to the brim with water. Tell students that the bucket represents water stored in a reservoir, pond, or lake.
- Tell students they are going to simulate changes in a watershed over several time periods. Each 30-second round represents a time period. In each round, students represent different water users; they may want to make nametags to identify their roles. *
- For each round, students should position themselves an equal distance from the water source. When the round starts, students fill their sponges with water from the reservoir (bucket). To represent water consumption, have them squeeze water out of the sponges into individual containers. Students can refill their sponges as often as they like during the round.
- At the end of each round, note how much water remains in the bucket. Tell students to empty half of the water from their containers back into the bucket. This represents used water that makes it back to the reservoir. (Students will notice that the water is colored. Inform them this represents sewage and runoff from urban and rural areas.
- Record students' comments about the amount of waste materials generated; compare after each round. To represent the water source eventually cleaning and replenishing itself over time, fill the bucket to the brim with clean water before each round.
- Have students keep a graphic organizer or journal of their findings and thoughts about water quality and pollution.

* 3 Students receive $\frac{1}{4}$ sponge represent town residents; 5 receive $\frac{1}{3}$ sponge represent town residents; 5 receive $\frac{1}{2}$ sponge representing 1 factory and 4 service agencies; 4 receive whole sponges representing 2 farms, 1 power company and 1 industry.

** See Below.

Procedure/Activity:

Field Trip (multiple users of water resources can affect water quality and examine the complexities of providing water for all users) - Field Trip occurs before closure of lesson plan!

Closure:**Post-Field Trip Activity**

Conservation and practical uses of water can be employed by water users to prevent water shortages and/or pollution. If water sharers consider the needs of all water users and plan for and manage those needs, then water of sufficient quality should be available.

- Have the students complete their graphic organizers or journal writings to use for their reflections.
- Have the students write a reflection or poem of the Pre-field trip activity as well as the field trip itself, including ways to prevent shortages and/or pollution. This can be used as an example of persuasive writing.
- Have those students who wish, share their reflection/poem with the class or have a sharing activity with small groups.
- Have a class discussion over ways to conserve water and prevent pollution.

Evaluation/Assessment:

- Students will be assessed based on their participation in the pre-field trip activity as well as the field trip itself.
- Students will be assessed on the content of their reflections, including grammar and spelling. They will also need to include their own thoughts on the prevention of pollution as well as their thoughts on the quality of our water.
- Students should demonstrate knowledge of the standards indicated above in their writings.

* Rubric attached

Reflection:

Students will write a reflection/poem to share with the class or with small groups. There will also be a class discussion.

**Rounds can be changed to incorporate History as well. For example:

- Round 1: 200 years ago, 3 students with $\frac{1}{4}$ sponge
- Round 2: Early 1900s: 6 students with $\frac{1}{4}$ sponge, representing homesteaders, 1 with $\frac{1}{2}$ sponge representing a large farm
- Round 3: after WWII: 10 students with $\frac{1}{3}$ sponge represent residents of town; 4 students with $\frac{1}{2}$ sponge represent 1 factory and 3 service agencies; and 3 students with whole sponges represent 2 farms and 1 power company
- Round 4: Present day: 3 students with $\frac{1}{4}$ sponge represent town residents; 15 students with $\frac{1}{3}$ sponge represent town residents; 5 students with $\frac{1}{2}$ sponge represent 1 factory and 4 service agencies; and 4 students with whole sponges represent 2 farms, 1 power company, and 1 industry

Appendix A: Two Column Chart

Community Member	How They Use Water
<i>List in order of use</i>	
1.	1.
2.	2.
3.	3.
4.	4.
5.	5.
6.	6.
7.	7.
8.	8.
9.	9.
10.	10.

Appendix B: Rubric for Assignments

		Exemplary (8-10 points)	Adequate (4-7 points)	Inadequate (0-3 points)
Knowledge _____	Students are knowledgeable that water is in limited supply and essential for life.	Student demonstrates exemplary knowledge of water supply and its essential use for life in their journal and/or during discussion.	Student shows adequate knowledge of the water supply or that it is essential for life in their journal and/or during discussions	Student does not demonstrate knowledge of our water supply and it uses in their journal and/or class discussions.
_____	Students understand that water can be depleted or polluted, making it unsuitable for life.	Student demonstrates an exemplary understanding of water depletion and pollution in their journal, during discussions, and writings.	Student demonstrates an adequate understanding of water depletion or pollution in their journal, during discussions, and writings.	Student does not demonstrate an understanding of water depletion or pollution in their journal, during discussions, and writings.
Skill _____	Students are able to analyze and interpret findings in more than one way.	Student shows exemplary skills in analyzing and interpreting data in several ways.	Student shows adequate skills in analyzing and interpreting data in one or two ways.	Student does not demonstrate skills in analyzing and interpreting data.
Performance _____	Students write a persuasive reflection stating their position, supporting their position, and providing organized and relevant evidence.	Student shows exemplary command of persuasive writing, stating and supporting their position with organized evidence.	Student shows adequate command of persuasive writing, stating their position and supporting with only one or two reasons.	Student does not demonstrate knowledge of persuasive writing concepts.
_____	Students anticipate reader concerns and include counterarguments.	Student demonstrates exemplary command of possible reader concerns and counterarguments.	Student addressed only one or two possible concerns of readers.	Student did not address any reader concerns or counterarguments.
_____	Grammar and punctuation.	There are no grammatical and/or punctuation errors.	There are no more than 3 grammatical and/or punctuation errors.	There are several grammatical and/or punctuation errors.

Total _____