Title: Saving Water: One Drop at a Time

Project Idea: This PBL Unit will permit students to become familiar with our water source, availability, costs, their own family usage, and the opportunity for wise usage through learned conservation techniques.

Entry Event: After Recess or Physical Education class brings the students back to the room. Tell the students that the water fountains are not working and there is no water for them to drink. Then have the representative from the local WV Department of Natural Resources walk in carrying a cooler filled with ice cold bottles of water for every student. The representative will tell the students if we do not do something about the over consumption and wasted use of our water resources the clean water supply could be totally depleted. The representative will then discuss the global effects of a water shortage. They will stress how the lack of waters affects the entire existence of the world. They will then move on to the possible reasons for the water restrictions by the federal government. Each student will receive Saving Water: One Drop at a Time Fact Sheet. The representative will then tell them that they over the next few weeks they will be asked to complete several activities that will help the WV Department of Resources access the water usage in their area. Once they have conducted their research they will be asked to create a brochure and a multi-media presentation to be used in the area to educate the public about the importance of conserving water.

<table>
<thead>
<tr>
<th>Content Standards &amp; Objectives:</th>
<th>Objectives Directly Taught or Learned Through Discovery</th>
<th>Identified Learning Target</th>
<th>Evidence of Success in Achieving Identified Learning Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>SC.0.5.2.1</td>
<td>demonstrate an understanding of the interconnections of biological, earth and space, and physical science concepts.</td>
<td>Students will develop an understanding of the interconnections of biological, earth and space, and physical science concepts thought the research of water usage.</td>
<td>Students will use the Saving Water: One Drop at a Time Fact Sheet along with other resources to complete an essay on the importance of conserving water. Students will also be asked to create a brochure and a multi-media presentation that will be used to inform the general public about the importance of conserving water. Combination Rubric Brochure Rubric</td>
</tr>
<tr>
<td>SC.O.5.2.23</td>
<td>identify resources as being renewable or non-renewable.</td>
<td>Students will realize that water is a non-renewal resource</td>
<td>Student will write an essay on the importance of conserving water as a non-renewable resource. Persuasive Essay Writing Rubric</td>
</tr>
<tr>
<td>SC.O.5.1.06</td>
<td>formulate conclusions through close observations, logical reasoning, objectivity, perseverance and integrity in data collection.</td>
<td>Students will formulate conclusions through close observations, logical reasoning on the usage of water in the home.</td>
<td>After completion of first lab: Data Collection: Water Use, student will estimate how much water they think they can save by using water saving techniques. Students will use conserving activities to decrease the gallons of water used in their home. Then complete the lab: Data Collection Weekly Water Use again. Students will create a brochure and a multi-media presentation that will be used to inform the general public about the importance of conserving water.</td>
</tr>
</tbody>
</table>
| RLA.0.5.2.01                | use the five –step writing process (prewriting, drafting, revision, editing, publishing) to generate topics. Plans and develop a 3-5 paragraph composition | Students will use a graphic organizer to brainstorm ideas, prewrite, edit and publish | Student will write an essay on the importance of conserving water, a non-renewable resource. Students will use a graphic organizer (Four Square Writing Graphic Organizer) to brainstorm ideas,
<table>
<thead>
<tr>
<th>Standard</th>
<th>Learning Objective</th>
<th>Teaching Strategies</th>
<th>Evidence of Success</th>
</tr>
</thead>
<tbody>
<tr>
<td>M.O.5.5.3</td>
<td>Collect and organize real world data to construct a circle graph (with and without technology), present data and draw conclusions.</td>
<td>Students will use conserving activities to construct a circle graph depicting their water usage.</td>
<td>Students will complete the Data Collection: Weekly Water Use both before implementing water saving techniques and again after implementing the techniques. <a href="http://nces.ed.gov/nceskids/createagraph">http://nces.ed.gov/nceskids/createagraph</a> They will then use the above site to create a visual representation (circle graph) of their water consumption (using this website all they have to do is insert the date they collected).</td>
</tr>
<tr>
<td>M.O.5.5.1</td>
<td>Construct a sample space and make a hypothesis as to the probability of a real life situation overtime, test the prediction with experimentation, and present conclusions (with and without technology).</td>
<td>Students will make a hypothesis, and test their prediction in a real life situation. They will then present their findings using technology.</td>
<td>After completion of first Water saving data collection student will estimate how much water they think they can save by using water saving techniques. Students will use conserving activities to decrease the gallons of water used in their home. After the Data Collection: Weekly Water Use is complete the second time students will begin to design an environmental brochure and a multi-media presentation to educate the public on the importance of conserving water. Brochure Rubric Combination Rubric</td>
</tr>
<tr>
<td>M.O.5.1.11</td>
<td>Solve real world problems involving whole numbers and decimals to justify the reasonableness by estimation.</td>
<td>Students will use problem-solving strategies to analyze the amount of water saved when conservation methods are used.</td>
<td>Students will Compile information by using a T-Chart to compare and contrast data from circle graphs to determine the amount of water saved in their home.</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>21st Century Skills</th>
<th>Learning Skills &amp; Technology Tools</th>
<th>Teaching Strategies Culminating Activity</th>
<th>Evidence of Success</th>
</tr>
</thead>
<tbody>
<tr>
<td>Information and Communication Skills:</td>
<td>21C.O.5-8.1.LS3 - Student presents thoughts, ideas, and conceptual understanding efficiently, accurately and in a compelling manner and enhances the oral or written presentation through the use of technology.</td>
<td>The teacher will instruct students in the use of four square graphic organizer. Students use Microsoft Word to publish their conservation essays</td>
<td>Students will write an essay on conserving water, a non-renewable resource. Completion of Four Square Writing Graphic Organizer Persuasive Essay Writing Rubric</td>
</tr>
</tbody>
</table>
21C.O.5-8.1.TT4 - Student uses audio, video, pictures, clip art, moviemaker programs, webpage design software, electronic documents, and other files to create and publish electronic products to communicate with various audiences inside and outside the classroom.

21C.O.5-8.1.TT7 - Student uses advanced features and utilities of presentation software (e.g., design templates, design layouts (fonts/ colors/ backgrounds) animation and graphics, inserting pictures, objects, movies, sound, charts, hyperlinks, and graphs) to create an original product.

The teacher will Instruct students how to use the circle graph website as an effective tool for making charts and analyzing data. The teacher will instruct students on downloading images from the Internet and engage students in creating a multimedia presentation using the downloaded images from the Internet that communicates the importance of water conservation.

Students will complete a circle graph using collected household data. The circle graph will be a visual representation of their data. Students will also complete a multimedia presentation about water conservation. A Combination Rubric will be used to evaluate the presentation point group presentations. Multi-media Checklist

Students will use all of their data and research to create a brochure and a multimedia presentation on saving water. Brochure Rubric Combination Rubric Multi-media Checklist

The teacher will instruct students how to use the circle graph website as an effective tool for making charts and analyzing data. The teacher will instruct students on downloading images from the Internet and engage students in creating a multimedia presentation using the downloaded images from the Internet that communicates the importance of water conservation.

Thinking and Reasoning Skills:

21C.O.5-8.2.TT4 - Student formulates a plan and uses technology tools and multiple media sources to compare and analyze information in order to solve real-world problems.

The teacher will instruct the students in various uses of technology and media resources.

Students will use the collected data to create computerized circle graphs and compile this information into the Monthly Water Usage T-Chart.

Personal and Workplace Skills:

21C.O.5-8.3.LS1 - Student manages emotions and behaviors, engages in collaborative work assignments requiring compromise, and demonstrates flexibility by assuming different roles and responsibilities within various team structures.

The teacher will model various proper and improper emotions and behaviors while working in groups.

Students will create a team contact at the beginning of the project and will monitor the contract throughout the project. Collaboration Rubric Daily Reflection Log

Performance Objectives:

Know
- Causes of water shortage
- Ways to conserve water
- Effects of water conservation
- Calculate percentages
- Create circle graphs
- Use Internet effectively
- Effects of water shortage
**Driving Question:** How can citizens change their behaviors to conserve (water) resources so governments do not have to create policies and enforce restrictions?

**Assessment Plan:**

<table>
<thead>
<tr>
<th>Major Group Products</th>
<th>Major Individual Projects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Design Water Conservation Brochure</td>
<td>Family Water Usage Data</td>
</tr>
<tr>
<td>Create Power Point Presentation</td>
<td>Construct Circle Graphs</td>
</tr>
<tr>
<td>Combined Family Water Usage Data</td>
<td>Persuasive Essay</td>
</tr>
</tbody>
</table>

**Rubric(s) I Will Use:**

<table>
<thead>
<tr>
<th>Rubric(s)</th>
<th>Collaboration</th>
<th>Critical Thinking &amp; Problem Solving</th>
<th>Oral Communication</th>
<th>Written Communication</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>X</td>
<td>Content Knowledge Combination Rubric</td>
<td>Other Brochure Rubric</td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

**Other Classroom Assessments For Learning:**

<table>
<thead>
<tr>
<th>Assessment and Reflection</th>
<th>Quizzes/Tests</th>
<th>Self-Evaluation</th>
<th>Peer Evaluation</th>
<th>Online Tests and Exams</th>
<th>Survey</th>
<th>Discussion</th>
<th>Reflections</th>
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<tr>
<td></td>
<td>Practice Presentations</td>
<td>Notes/Labs Data Collection</td>
<td>Checklists/Observations Multi-media Checklist</td>
<td>Concept Maps 4 Square Graphic Organizer</td>
<td>Focus Group</td>
<td>T Chart Analysis of Water Usage</td>
<td>Task Management Chart</td>
</tr>
</tbody>
</table>

**Product:** Brochure

**Map The Product:**

<table>
<thead>
<tr>
<th>Knowledge and Skills Needed</th>
<th>Already Have Learned</th>
<th>Taught Before the Project</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Collaboration Groups/ Responsibilities</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>2. Importance of Water Conservation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Use of Microsoft Word/Publisher</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Create Circle Graphs</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>5. Writing Skills</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>6. Print Brochures</td>
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</tbody>
</table>
Resources:

**School-based Individuals:**
- Classroom Teacher
- County Technology Coordinator
- Principal

**Technology:**
- Internet Access
- Laptop Computers
- Multi-media Software
- Microsoft Publisher
- Graphing Calculators (TI 73)

**Community:**
- Water Company Representative
- Public Service District Representative
- Representative from the local WV Department of Natural Resources
- Families

**Materials:**
- Water Company Survey
- Household Water Statement
- Estimated Water Usage Chart
- Data collection: Weekly Water Use
- Ways to Conserve Water Chart
- T-Charts
- Multi-media Checklist
- Four Square Writing Graphic Organizer – Directions for Four Square can be found at [http://www.beaconlearningcenter.com/documents/4494_3993.pdf](http://www.beaconlearningcenter.com/documents/4494_3993.pdf) (Directions and rubric for grading can be found at this site).
- [http://nces.ed.gov/nceskids/createagraph](http://nces.ed.gov/nceskids/createagraph) (This site is great for creating various graphs, just click on Graphs at the top of the page).
- Materials for Brochure
- Bookmarked Websites
- Presentation Software
- Internet Access
- Colored Printer for Circle Graphs
- Rubrics for Assessment
- Data Projector

Manage the Process:

See [Project Map](#).

Special needs students will complete task with the assistance of a peer mentor and all grouping will be heterogeneously. Special needs students will receive accommodations when needed. Students will be divided into groups by the teacher and each group must create a contract (sample [Team Contract Template](#) provided) outlining individual responsibilities relating to the completion of the brochure and presentation. To make sure students stays on task you may want to have them complete a daily [Task Management Log](#) or journal entries.

**Before the project:** Students will attend a presentation given by a Resource Manager from local Water Company (or representative from local public service district) about water usage in the area. If possible maybe even tour a water treatment plant.

Entry Event – After Recess or Physical Education class brings the students back to the room. Tell the students that the water fountains are not working and there is no water for them to drink. Then have the representative from the local WV Department of Natural Resources walk in caring a cooler filled with ice cold bottles of water for every student. The representative will tell the students if we do not do something about the over consumption and wasted use of our water resources the clean water supply could be totally depleted. The representative will then discuss the global effects of a water shortage. They will stress how the lack of waters affects the entire existence of the world. They will then move on to the possible reasons for the water restrictions by the federal government. Each student will receive [Saving](#)
**Water: One Drop at a Time Fact Sheet** The representative will then tell them that over the next few weeks they will be asked to complete several activities that will help the WV Department of Resources access the water usage in their area.

Below is a sample flow chart of events for the project (group size and the number of days needed for the project will vary depending on your students and your schools schedule):

**Stage 1:**

Students will individually complete the [Water Company Questionnaire](#) at home with their parents.

Students will bring their completed [Water Company Questionnaire](#) back to class for group discussion. If your students receive water from different companies you may wish to take time here to compare and contrast the rates of the various companies (optional).

**Stage 2:**

Students will work independently using a [Four Square Graphic Organizer](#) to write an essay on the importance of conserving water. [Persuasive Essay Writing Rubric](#) used for assessment.

**Stage 3:** LAB

Students take a [Data Collection: Weekly Water Use](#) (lab) home to collect data on water usage for one week without using conservation activities.

Use data collected to construct a circle graph on web site [http://nces.ed.gov/nceskids/createagraph](http://nces.ed.gov/nceskids/createagraph) (this site is very user friendly and you may want to put the students on the site prior to the project and practice creating graphs).

Then, students and their families will put all conservation ideas into place and record for the second time the data collected on the [Data Collection: Weekly Water Use](#) (lab).

Students use the data to create a second circle graph [http://nces.ed.gov/nceskids/createagraph](http://nces.ed.gov/nceskids/createagraph).

Students will then put their findings into the [T-Chart](#).

Using their T-Chart, first and second circle graphs students will use calculators to compare and contrast the amount of water saved during the second [Data Collection: Weekly Water Use](#). Students will submit their findings to the teacher in writing and create a bar graph [http://nces.ed.gov/nceskids/createagraph](http://nces.ed.gov/nceskids/createagraph) depicting their findings.

**Stage 4:**

Students work in groups of four using (team contracts will need to be completed and signed here) information they have learned to design an environmental brochure ([Brochure Rubric](#)) to educate the residence in there are on the importance of conserving water. Teams need to complete a [Daily Task Management Log](#). The brochure needs to include background information on the importance of water conservation as well as various ways that individuals can help conserve water based on their findings in this project. You may choose to use their [Multi-media Checklist](#) criteria to guide the brochure as well or you may choose to create your own criteria.

Research and work time.

Students, teachers, and principal will vote on the best brochure to be distributed to the general public and displayed in area businesses.

**Stage 5:**

The teams will then prepare a Multi-media presentation ([Combination Rubric](#), [Multi-media Checklist](#) on the importance of water conservation (if students have not used Multi-media
software before you may have to provide some direct instruction in technology at this point).

Research, prep-time, and practice presentations.

Students present their Multi-media presentation to the principal, teacher, class members, Department of Natural Resources representative and WV American Water Company representatives (or representative from the local public service district).

Project Evaluation: The teacher will conduct individual and small group conferences throughout the project to check for accuracy and understanding. At the end of the project allow students to complete a 3-2-1 Chart. 3 things they learned from this project, 2 ways your family will conserve water, and 1 thing that you would have changed about this project.

Resource Files

- UP3400WS2.doc
  (http://wveis.k12.wv.us/Teach21/CSO/Upload/UP3400WS2.doc)

- UP3400WS3.doc
  (http://wveis.k12.wv.us/Teach21/CSO/Upload/UP3400WS3.doc)

- UP3400WS4.doc
  (http://wveis.k12.wv.us/Teach21/CSO/Upload/UP3400WS4.doc)

- UP3400WS5.doc
  (http://wveis.k12.wv.us/Teach21/CSO/Upload/UP3400WS5.doc)

- UP3400WS6.doc
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- UP3400WS15.doc
  (http://wveis.k12.wv.us/Teach21/CSO/Upload/UP3400WS15.doc)

- UP3400WS16.doc
  (http://wveis.k12.wv.us/Teach21/CSO/Upload/UP3400WS16.doc)