



## Water in the Community

### Unit Summary

Doing the activities in this unit, will help students answer the question, "Why is water important?" that we should learn how to conserve water.

Students will group themselves according to the community (barangay) where they come from. Working in groups, students interview households in their barangay on how they use water and help their barangay inform the residents of the importance of water, how they can help conserve water, and how to help keep our water clean. To do this, students create information campaign materials such as a newsletter, poster, and a multimedia presentation.

Hands-on, students will do laboratory activities on water cycle, waters of the world, properties of water, and on how water is purified. The activities will provide students with knowledge on how much water is there on Earth, how water cycle maintain the quantity of waters on Earth, and what properties of water make it an indispensable material.

Towards the end of the unit, students will also have a field trip to the nearest water treatment facility to interact with experts and learn how water concessionaires make the water safe for drinking.

### Curriculum-Framing Questions

- **Essential Question**

Why is water important?

- **Unit Questions**

How do different communities use water?

Are you using water properly?

- **Content Questions**

How much water is there on Earth?

How does water cycle maintain the quantity of waters on Earth?

What properties of water make it an indispensable material such as a solvent, cleaning agent, and temperature moderator?

How is water for drinking purified?

### Instructional Procedures

Things that need to be done prior to the implementation of the Unit Plan in class:

- To ensure student access to the school's Computer Laboratory, the teacher will inform the School Head about the unit and will coordinate with the Computer Laboratory In-charge regarding the schedule of implementation.
- If in case students still need to learn how to use the technology tools needed in this unit, the teacher will arrange with the Technology and Livelihood Education teacher, for the latter to teach the students how to use these technology tools.
- The teacher will send a letter to parents informing them about the project so that they will be aware of what their children will be doing in the course of the unit and to ensure their full support.
- In the Computer Laboratory, the teacher, with the help of the Computer Laboratory Technician, will create folders on the desktop of each computer where students can save their files.

### At a Glance

**Grade Level:** 7 (1st Year High School)

**Subject:** Science

**Time Needed:** 14 class meetings, where each meeting is for 60 minutes

### Things You Need

[Standards Resources](#)

- Make the necessary arrangements for the field trip and the survey the students will conduct such as writing letters of permission to Manila Water Company for the field trip, to the different Barangay offices regarding the survey, and to parents to allow their child to join the field trip. The teacher also ensures that the letter to the Barangay includes asking permission from the Barangay Captain regarding possibility of students to do an information campaign to inform residents of the barangay about the importance of water, how our water is treated such that they are safe for drinking, and what the community can do to help in conserve and keep our water clean.
- The teacher checks for resources (e.g., books, Internet sites) to use in class during the unit.
- The teacher requests the laboratory technician to prepare the apparatus and chemicals needed during the laboratory the experiments.

For things that need to be done during the Unit, please refer to the [implementation plan](#) (DOC 58.5KB).

### **Meeting 1: Introducing the Unit**

Venue: Computer Laboratory or a classroom with teacher computer and a multimedia projector.

- The teacher uses the following motivation questions to start the Unit: *Water, water, everywhere... but where is it? Do you have water in your homes? Where does this water come from? How does it reach your home? How do you and your family use water?*
- Teacher shows photos showing different activities using water. From the pictures shown, the Students will be asked to identify the activities and point out which activity uses much water. From this, the teacher then asks the class the question, "Will we ever run out of water?" The teacher then introduces the class to what the Unit will cover and what they will do in the course of the Unit. This leads to the presentation of the project students will do in the course of the Unit including informing the class of the interviews they will conduct and the field trip they will have to learn about water treatment done by water distribution companies. The teacher also distributes the parent's permission form which will be collected on the day before the field trip.
- Students form teams to conduct an interview on community residents (member of households and commercial establishments) regarding how people in their community use water. If possible, students coming from the same Barangay will comprise one team.
- Based on the introduction of the teacher on the Unit, and specifically on the survey they will do in the course of the Unit, each group drafts the questionnaire they will use for the interview in consultation with the teacher then presents their work to the whole class. After the presentation, the teacher together with the whole class finalizes a common [interview questionnaire](#) (DOC 44.5KB).
- As a take home activity, students start conducting their interviews. Attached in the interview is a copy of the letter to the Barangay.

### **Meeting 2: Activity on Waters of the Earth**

Venue: Science Laboratory

- Students perform an activity on "[Waters of the Earth](#) (DOC 86KB)". After the students finish their tasks, teacher conducts a post-activity discussion to share and discuss answers to the activity questions.
- Teacher summarizes the activity by saying that "*although water is found everywhere on Earth, much of it is not available for drinking or for human consumption because it is salty. A lot of money, time, and effort are needed to convert it into usable form and bring it to every home on Earth.*"
- Teacher orients students on what to do in the second activity which is about [water cycle](#) (DOC 79.5KB). Students should start doing the activity on water cycle first thing in the morning in school such that in time for snack break, students will be able to observe what happens to their set up. They can have their experiment set up in the Science Laboratory. If the first meeting falls on a Friday, doing the activity on water cycle during Saturday is best.

### **Meeting 3: Activity on Water Cycle**

Venue: Science Laboratory

- In this meeting, the teacher asks students to continue the activity they started early in the morning and to answer the questions in the activity.
- A post-activity discussion follows after the students finish their tasks. The teacher facilitates the discussion of the answers to the activity questions.
- The teacher wraps up the activity with a presentation and discussion of the water cycle and the different sources of water.
- At this time students continue conducting their interviews as a take home activity. By this time also, each group should have coordinated with their barangay the information campaign that they will conduct to inform the barangay residents about the importance of water, how our water are treated such that they are safe for drinking, and what the community can do to help in conserving water and in keeping it clean.

**Meeting 4: Consolidating data**

Venue: Computer Laboratory

- Each group meets and consolidates the data gathered during the interviews each member conducted. Make sure that all students sign up in the [computer sign up sheet](#) (PDF 81.7KB) so the Computer Laboratory Technician can keep track of who uses each computer.
- Each group also processes results of the data they gathered.
- As a concluding activity, each group writes an article reporting the results of their interview. This will be one of the articles of the newsletter which their group will come up with as one of the requirements of the unit.

**Meeting 5: Reporting of Survey Results**

Venue: Computer Laboratory

- Each group then reports on the results of their interview and a class discussion on the interview results follows. As the class discusses results of the interview, the groups compare and classify the uses of water into 3 accepted categories, namely: agricultural, industrial, and domestic.
- Teacher summarizes the activity by highlighting key uses of water as presented by the different groups and relates this to what research says about the water consumption of an average Filipino household and how these households use water. Teacher also relates the discussion to the water distribution companies in Metro Manila like the Manila Water Company and the Maynilad and how they supply potable water to the different households in Metro Manila. The teacher then reminds the class of their upcoming field trip to the Manila Water Company to learn about its water treatment process.

**Meeting 6: Activity on Properties of Water (Part 1)**

Venue: Science Laboratory

- Students continue discussion about the effects of mankind's numerous activities on the properties of water.
- Students perform activities on the Solvent Property of Water and the Density of Liquid and Solid Water. Students then transform the data derived from the Activity on the Solvent Property of Water into a graph and analyze it. For their data on the Activity on Density of Liquid and Solid Water, they then plot the densities of water at various temperatures.
- Teacher conducts a post-activity discussion and relates the experimental data to the molecular structure of water and discusses the relationship between density and molecular structure of water using a [teacher-made presentation](#) (PPT 1.48MB). The teacher summarizes the meeting with a discussion on the applications of the properties of water to daily life.
- The teacher then distributes the [parent's permission form](#) (DOC 23KB) in preparation for the upcoming field trip.

**Meeting 7: Activity on Properties of Water (Part 2)**

Venue: Science Laboratory

- Students perform the activity on the Purification of Water.
- A post-activity discussion follows where they discuss how water can be purified before use or even after use.
- The teacher then wraps up the meeting by reminding them of the field trip to the Balara Treatment Plants of the Manila Water Company the following day. The teacher also collects the signed parent's permission form and discusses the dos and don'ts during the field trip.

**Meeting 8: Field Trip**

Venue: Balara Treatment Plants of the Manila Water Company

- During the field trip students interact with chemists and engineers. Students ask questions and take down note of the treatment process which they need to know be able to share to their community.

**Meeting 9: Post-Field Trip Activity**

Venue: Computer Laboratory

- Teacher discusses with students their experience during the field trip to the Balara Treatment Plant of Manila Water Company.
- After the discussion, students are given time to prepare a [presentation](#) (PPT 475KB) on the water treatment process they have learned from the field trip. They will use this when they help their Barangays in their water information campaign.
- The teacher monitors the progress of each group and at the same time checks the presentation of each group.

**Meetings 10 to 12: Creating the Poster and Finalizing the Newsletter**

Venue: Computer Laboratory

- Each group completes their campaign materials. They finish their articles for their [newsletter](#) (PDF 217KB) and they create their [poster](#) (DOC 228KB) on the cycle of water. These campaign paraphernalia will be used when they go back to their Barangays to inform the residents there about the importance of water, how our water are treated such that they are safe for drinking, and what the community can do to help in conserving water and in keeping it clean.
- Each group then presents their multimedia output and poster for peer and teacher evaluation. This will form part of the teacher's assessment of the students' performance during the unit.
- They will also revise their presentations based on the comments of their teacher and peers such that it will be ready for dissemination.

**Meetings 13: Information Campaign**

Venue: Barangay

- In cooperation with the Barangay Officials, each group gathers the barangay residents and informs them of the importance of water, how our water are treated such that they are safe for drinking, and what the community can do to help in conserving water and in keeping it clean. To do this, they will use their multimedia presentation on water treatment and distribute their posters and newsletters to the community.

**Meetings 14: Unit Test**

Venue: Classroom

- Students take a unit test.
- Teacher summarizes the Unit by asking students to share their answers to the following questions:
  - Why is water important?
  - How do different communities use water?
  - Are they using water properly?

**After Unit implementation, the things that need to be done are the following:**

- Within one week after Unit implementation, the teacher requires students to clean up the computer they used during the creation of the project outputs.
- The teacher will check if the Computer Laboratory was left clean and in proper order.
- The teacher sends thank you notes to MWSS, Barangay Captains, to school head, and Managers of commercial establishments.
- With the help of the students, the teacher returns apparatus, equipment, and chemicals to the Science Laboratory Technician.
- The teacher prepares the unit grades of students.
- The teacher reflects on the Unit implementation experience and revises the unit. This is also a good time for the teacher to think of another topic where technology can be integrated effectively.

**Prerequisite Skills**

Students should possess the following:

- Basic science and mathematics skills like computing, measuring mass, volume, temperature, and density;
- Simple laboratory techniques on the use of equipment, apparatus, and chemicals;
- Basic computer skills in using technology tools in creating presentations, publication materials, and in using spreadsheets to process data and create charts; and
- Basic skills in gathering resources from the Web, citing references properly; and gathering, summarizing, and representing data in tables and charts.

## Accommodations for Differentiated Instruction

### Resource Student

- For resource students, they may not conduct a survey but instead only an information search on the classification of water use. The teacher can also develop a short list which will guide students' information search.
- If in case students will conduct a survey, the teacher can develop the questionnaire herself and assist students in processing the data. Then students will just present this material to class and not to the community anymore.

### Gifted Student

- Gifted students can make a Web site informing a wider range of audience on the importance of water and some water savings tips. They can also include in their Web site a page where others can post to suggest other water savings tips.
- Gifted students can also research or interview experts on other water treatment procedure. They can interview owners of water stations which make use of new technologies in purifying water.

## Student Assessment

Group performance will be assessed based on how they process information, how they effectively communicate their ideas, how they collaborate with their peers, and how they perform in the laboratory activities. Project outputs of the groups will be assessed using the following rubrics developed by the teacher:

- Presentation Rubric
- Newsletter Rubric and
- Poster Rubric

Each type of output will be 20% of the group grade. These rubrics will be presented to students on the first day of the unit to guide students on what they should focus on their outputs. Performance in the laboratory activities is also 20%. Collaboration among group members will also be assessed using the collaboration rubric and this will be 20% of the group grade.

Individual grade will be 70% of the group grade and 30% of the Unit test which will be given at the end of the Unit.

## Key Word Search

- Conserving water
- Properties of water
- Uses of water
- Water
- Water cycle
- Water treatment

## Credits

Evelyn Josue, a staff of UP NISMED who participated in the Intel® Teach to the Future Training last March 2003, developed this Unit Plan. After the training, Ms. Josue had it content-reviewed and revised her training outputs based on the revisions suggested by the content reviewer. In 2007, additional enhancements were made by the Intel® Teach National Team from UP NISMED. This is the most recent enhanced version of Ms. Josue's Unit Plan.

***Note:** The hyperlinked support documents are not part of the PDF. They can be downloaded and printed individually.*

Targeted Philippine Basic Education Curriculum Competencies  
**Department of Education Revised Basic Education Competencies 2002  
for First Year Integrated Science  
Unit VI Changes in the Environment**

Demonstrate understanding of the changes in the hydrosphere

1. Explain the water cycle and how it maintains the quantity of water on Earth
2. Observe the different uses of bodies of water in your community (e.g., domestic, agricultural and industrial, for transportation and energy generation, as habitat for living things, in changing landforms, and in maintaining air temperature)
3. Classify the body of water (e.g., river) according to type and uses
4. Help organize/participate in the community campaign

**Student Objectives/Learning Outcomes**

At the end of this unit, students should be able to:

- Develop an interview guide for a community survey on the uses of water
- Interview member(s) of household and community on their uses of water and summarize the results
- Classify the different uses of water and sources of water
- Explain the water cycle and how it maintains the quantity of water on Earth
- Describe how water is purified at the Balara Water Treatment facility of Manila Water Company
- Publish a newsletter that will show findings they gathered from the community survey
- Inform the public of the water purification techniques used by the a nearby water treatment facility
- Discuss water resources and uses
- Discuss the properties of water
- Conduct experiments on properties and structure of water
- Participate in the *barangay's* campaign to protect and conserve water in the community by distributing a poster and newsletter that inform the community on water saving tips.

## Designing Effective Projects: Water in the Community Resources

### Materials and Resources

#### Printed Materials

- Student Activity Sheets:
  - Activity 1: Waters of the World
  - Activity 2: Water Cycle
  - Activity 3: Solvent Property of Water
  - Activity 4: Density of Liquid and Solid Water
  - Activity 5: Purification of Water
- Evaluation forms for multimedia presentation, newsletter, and poster
- Interview Questionnaire
- Letter to Parents

#### Supplies

- Blank CD-Rs and other storage devices where students store the pictures, materials they gathered
- Bond paper which students can use to print draft and final copies of their publication and presentation materials
- Ink cartridge for printing
- Manila paper, colored pencils, eraser, paste, scotch tape, stapler and staple wires

#### Internet Resources

- Animated clip arts were obtained from these websites:  
<http://www.barrysclipart.com/animations/index.html>\*  
<http://www.free-clipart.net/main.html>\*
- Quotes were taken from these websites:  
<http://www quotablequotes.net/>\*
- Evaluation Rubric were based on the resources from these sites:  
<http://www.ncsu.edu/midlink/mm2002.rubric.htm>\*
- Water-related Information  
[http://www-k12.atmos.washington.edu/k12/pilot/water\\_cycle/index.html](http://www-k12.atmos.washington.edu/k12/pilot/water_cycle/index.html)\*  
This provides different activities to understand each stage of the water cycle.
- <http://www.awwa.org/advocacy/learn/>\*  
These pages provides facts, resources, conservation tips, and products that will help answer questions and provide knowledge related to drinking water.
- <http://www.jeonet.com/city/water.htm>\*  
This article discusses why we should conserve water and the four basic components to a water conservation program.
- <http://www.manilawater.com/about-us/water-supply-system>\*  
This page discusses the water treatment process for the water distributed by the Manila Water Company.

#### Technology – Hardware

- Camera
- Computer(s)
- Digital Camera
- Internet Connection
- Printer
- Scanner
- VCR
- Video Camera

**Technology – Software**

- Image Processing
- Encyclopedia on CD-ROM
- Multimedia
- Microsoft Word\* Processing
- Web Browser
- Desktop Publishing