

Healthy Water Healthy Habits Healthy People

***Educators Guide on Water, Health,
Sanitation and Disease Prevention***



Educators Guide Development Process

In February 2008, the Project WET Foundation held a Writing Workshop in Africa. Over 50 experts in education and health representing nonprofit and community organizations from numerous countries helped shape the *Healthy Water, Healthy Habits, Healthy People Educators Guide*.

Using a process it developed, Project WET has conducted more than 20 Writing Workshops globally and produced numerous publications customized to the needs of local areas. This process, combined with 25 years of experience in developing hands-on, interactive activities, is what makes Project WET resources effective tools for educators and students throughout the world.

Award-Winning Publication



The *Healthy Water, Healthy Habits, Healthy People Educators Guide* was named a Distinguished Achievement Award winner by the Association of Educational Publishers (AEP) at AEP's 2009 Summit. *Healthy Water, Healthy Habits, Healthy People Educators Guide* is the 17th Project WET publication to earn AEP recognition.

Established in 1895, AEP is a national, nonprofit professional organization for educational publishers and content developers. For more than four decades, AEP's Awards have honored outstanding resources for teaching and learning. One of the largest and longest-running awards programs for educational products, AEP's Awards aim to give credit and recognition to the organizations that are leading the way in the field of educational products and set benchmarks to which the rest of the industry can aspire.

Healthy Water, Healthy Habits, Healthy People Educators Guide on Water, Health, Sanitation and Disease Prevention

© 2010 Project WET Foundation. All rights reserved.

ISBN: 978-1-888631-73-9

Second Edition

First Printing 2010, Impress Communications

Nothing in this volume may be copied or reproduced by any means without the written permission of the Project WET Foundation, in accordance with copyright policy established by the Project WET Foundation, except for those pages designated as student or teacher resource pages, which may be produced without permission for educational use in conjunction with the activities contained herein.

Project WET Foundation
1001 West Oak Street, Suite 210
Bozeman, Montana 59715 USA
1-406-585-2236
1-866-337-5486
info@projectwet.org
www.projectwet.org

Why Project WET?

Learning to Succeed in the 21st Century

Global water problems continue to escalate and affect the quality of life for billions of people. The struggle to acquire and maintain clean water supplies saps the energy of communities; children, too ill to attend school because of the effects of waterborne diseases, lose too many precious childhood days. Empowering students through an understanding of the relationship between their health and water resources, teachers can be catalysts in their communities. Project WET materials and training workshops help educators, students and their families understand sustainable water resources management.

Project WET is currently active in over 50 countries on five continents. Its materials have been translated into several languages including Japanese, Hungarian, Spanish, French, Arabic and Kiswahili. Students, teachers and community members of diverse cultures, often with different learning styles, use Project WET. From photographs taken around the world, children and adults participating in Project WET activities and events all have one thing in common—a smile.

So, we have to ask ourselves, why does it work? Project WET materials motivate children and adults to learn. Educational theorists maintain that for people to learn, they must find pleasure and joy in learning. What are the qualities of Project WET materials that appeal to children’s natural curiosity and support lifelong learning?

- **Interactive:** Learners participating in Project WET activities are not passive observers. Engaging students through questioning and other inquiry-based strategies, educators become facilitators involving students in hands-on lessons and encouraging them to take responsibility for their own learning. For example, students design investigations to seek answers to real-world problems; play games to explore scientific concepts; reflect; debate; and share learnings by creating songs, stories and dramas.

- **Multi-sensory:** Activities engage as many of the learner’s senses as possible. Research has shown that stimulation of multiple senses enhances learning.
- **Adaptable:** While adaptable for any environment, many Project WET activities are ideal for outdoor settings and encourage children to be physically active.
- **Contemporary (21st Century Skills):** Project WET activities help students develop skills necessary for success in the 21st century. In most activities students work in small, collaborative groups; many activities engage students in higher level thinking skills requiring them to analyze, interpret, apply learned information (including problem-solving, decision-making and planning), evaluate and present. Project WET is aggressively incorporating technology education into its activities and offering cross-cultural materials to prepare learners for participation in a global economy, in which an understanding of water resources will be critical.
- **Relevant:** Information is not delivered in isolation; educators are encouraged to localize activities to give them relevance.
- **Solution-oriented (ActionEducation):** Project WET believes in linking awareness and education to action and solutions. In this context, Project WET and local education and water partners seek to incorporate educational materials and training with on the ground action and solutions.
- **Measurable:** Project WET activities provide simple assessment tools to measure student learning.

And what do learners participating in Project WET activities say? Pausing to catch their breath in a game of tag that demonstrates the relationship between healthy habits and healthy drinking water, students will tell you they like Project WET activities simply because they’re fun!

Healthy Water, Healthy Habits, Healthy People

An Educators Guide on Water, Health, Sanitation and Disease Prevention

Table of Contents

Why Project WET? Learning to Succeed in the 21st Century **i**

How to Use This Activity Guide **2**

Activities

Healthy Habits **3**
Students learn to identify and prevent common water- and hygiene-related diseases by acting out symptoms, methods of spreading disease, and healthy habits.
Disease Cards – Resource Page 7

Don’t Pass It Along **8**
Students learn how illness-causing germs can spread through contact and how healthy habits can stop them.

Hand Washing for Health **11**
Students learn a song to correctly practice the healthy habit of hand washing.
Soap Story Cards – Resource Page 15
Hand Washing for Health – Resource Page 16
How to Construct a Tippy Tap – Resource Page 17

Break the Chains **18**
Students use problem solving skills to discover how to break the chains of disease transmission.
Disease Transmission Chain Cards – Resource Page 21

The Path to Healthy Drinking Water **22**
By understanding how to treat water in their own homes, students contribute to their health, as well as that of their families and communities.
Steps Along the Path to Healthy Drinking Water – Resource Pages 26 - 27

Finding Healthy Water Sources **28**
Students map drinking water sources in their community, identify signs of healthy water sources and learn how to protect them.
Signs of a Healthy Water Source – Resource Page 32

Water Wisdom **33**
Generations hand down wisdom through stories and proverbs. Students use them as a guide to create their own wise sayings about water.
Proverbs – Resource Page 37

How to Use This Guide

All activities are self-contained. Although the activities in this Guide represent a unit, it is not necessary to teach them in order. Each lesson in the Educators Guide corresponds to a two-page activity in the student booklet of the same title.

Subject Areas:

Project WET activities are designed to satisfy the goals of your educational program by complementing existing curricula. This section suggests subject areas in which you could teach this activity.

Duration:

The approximate time needed to complete each part of the activity.

Setting:

Suggested sites.

Skills:

There are eight skill levels in ascending order: gathering, organizing, analyzing and interpreting information; applying, evaluating and presenting learned information. Listed skills are applied in the activity.

Vocabulary:

Words defined in the activity that you may need to highlight for students.

Summary

A brief description of the activity concepts and students skills.

Objectives:

The qualities or skills students should possess after participating in the activity.

Materials:

Supplies needed to conduct the activity.

Making Connections:

Describes the relevance of the activity to students.

Background:

Information needed to understand activity concepts.

Procedure

Warm Up

Prepares everyone for the activity and gives the educator an idea of students' current knowledge about the topic.

The Activity

Provides step-by-step directions for conducting the activity. Some activities are organized into "parts." All, or some, of the parts may be used, depending upon instructional objectives.

Wrap Up

Brings closure to the lesson and includes questions and

activities to assess student learning.

Assessment

Presents diverse assessment strategies that relate to the objectives of the activity, noting the part of the activity during which each assessment occurs.

Extensions

Provides additional activities for continued investigation into concepts addressed in the activity. Extensions can be used for further assessment.

Resources

References from the internet that enhance the 'Background' section.

* A note about age and skill level for this Guide: The activities in this Guide will benefit learners of all ages and skill levels.

Healthy Habits

How does what you do on the outside (wash hands, cover a cough, boil water) keep you healthy on the inside?

Subject Areas:

Science, Drama

Duration:

Warm Up: 15 minutes

Activity:

Part I: 45 minutes

Part II: 45 minutes

Wrap Up: 30 minutes

Setting:

Classroom, theater facility, large common room or outdoor area

Skills:

Gathering (observing, listening);

Interpreting (relating, summarizing);

Applying (planning, designing); Presenting (acting)

Vocabulary:

bilharzia, cholera, dysentery, epidemic, germ, hepatitis, malaria, microorganism, parasite, polio, symptom, toxins, transmission, typhoid fever

Summary

Students learn to identify and prevent common water- and hygiene-related diseases by acting out symptoms, methods of spreading disease and healthy habits.

Objectives

Students will:

- link water- and hygiene-related diseases to their causes and symptoms.
- describe how some common water- and hygiene-related diseases are spread.
- identify ways to reduce the chances of becoming infected with a disease.

Materials

- Chalkboard
- Area for 'Healthy Habits' tag game
- **Disease Cards – Resource Page**

Making Connections

Understanding diseases, their causes, transmission and symptoms empowers students to develop healthy habits to help prevent disease.

Background

Germs are disease-causing agents that can make you sick. You can find them anywhere in the world. Types

of disease-causing agents include: bacteria (tiny single-celled organisms), fungi, viruses, and parasites (protozoa and worms). Some of these can be harmful to humans while others are beneficial. For example, some bacteria help our body's immune system fight disease-causing agents. When disease-causing germs invade your body and your immune system can't fight them, they multiply and gain strength. Germs take nutrients and energy from your body and can produce toxins (chemicals that damage cells). Your body reacts to the toxins, creating symptoms (evidence or signs of illness).

Different diseases cause different symptoms. However, different diseases can share the same symptoms. The best way to diagnose and treat any illness is to consult a doctor or nurse. Doctors and nurses diagnose diseases through a process of elimination. When you are sick, they may ask you about your habits and the symptoms you are experiencing. In addition, they may conduct laboratory tests to diagnose the illness.

One way you can learn to avoid getting a disease is to understand how it is spread. Common ways diseases are

spread include:

- droplet contact – (inhaling or other contact with droplets coughed or sneezed by an infected person).
- direct physical contact – (touching an infected person or infected bodily fluids).
- indirect contact – (touching a contaminated surface).
- airborne transmission – (breathing in contaminated dust particles or airborne germs that can remain alive in air for long periods).
- fecal-oral transmission – (consuming contaminated food or water, and indirect contact that spreads germs from feces).
- vector transmission – (contact with insects or other animals that transmit disease).

Practicing the following healthy habits helps to prevent the spread of diseases:

- Washing your hands frequently with soap and clean water, especially before or after certain activities (e.g., before preparing food and after going to the latrine)
- Covering your mouth when you cough or sneeze
- Protecting yourself from insects and animals that may carry disease (e.g., to prevent malaria, sleep under a mosquito net)

- Boiling all your household drinking water
- Avoiding sharing clothing and bedding

Procedure

Warm Up

Ask students to name diseases they are familiar with, and list them on the board.

Ask students what causes diseases (germs). Emphasize that there are both harmful and beneficial germs. Discuss the fact that one disease-causing germ will probably not make you ill, but once these germs multiply in your body, you can experience symptoms of the disease.

The Activity

Part I

1. Establish a defined area where your students can play a game of tag.
2. Have students participate in a game of “Healthy Habits” tag to simulate how diseases are spread through a community.
3. Ask for one volunteer to be “it.” Explain that this student will be a disease ready to infect other people.
4. Ask for five more volunteers. Gather all volunteers, including the student who has been identified as “it.”
5. Explain to this group that they will be sharing a secret. Each of the five students will be given a different role. Each role represents a healthy habit supporting the body’s immune system. Therefore, each of these students must be tagged three times before becoming “ill.”

6. Assign roles to the volunteers and answer any questions from the students. Use the healthy habits below or create your own for this activity.
 - **Role 1:** You washed your hands with soap and water after using the latrine.
 - **Role 2:** You slept under a mosquito net and avoided mosquito bites.
 - **Role 3:** Your family boiled all the water they use in the house.
 - **Role 4:** You drained stagnant water from around your house.
 - **Role 5:** You received the correct vaccinations.
7. Explain to the group that if you are tagged by the student who is “it,” (the disease), you must leave the playing area and sit on the sidelines. As an alternative to having tagged students sit on the sidelines you may want to rope off a portion of the playing area and designate it as the “Hospital”.
8. Time the game so that it lasts three to five minutes.



9. After time expires, gather the group.
10. Ask students to raise their hands if they did not become sick the first time they were tagged. (These students should be the ones who received the healthy habits roles at the start of the game.)

Ask them to reveal the secret to their health (that is, the healthy habit that protected them from being tagged by the disease).

11. Ask students to identify other healthy habits that help support the body’s immune system.

12. Repeat the game, this time asking for five new volunteers to come up with their own healthy habits.

Part II

1. Divide the class into groups of four to eight students. Hand one

Disease Card to each group. More than one group can have the same **Disease Card**.

- Instruct the class that each group will prepare a short role play (possibly including a song or a poem) to teach classmates about the illness described on the card. Encourage groups to be creative and accurately share as much of the information on the cards as possible. Each role play should be no more than three minutes. Circulate among the groups to check progress, note missing elements, and offer ideas. Encourage students to make their role play fun, for example:
 - Make the disease-causing germ on your card into a character. Give it a personality, and have it interact with the people in the role play.
 - Exaggerate the symptoms.
 - Be dramatic about how the disease is spread and how people can avoid the disease.
- Have groups present their role plays.
- After each role play is completed, have a brief discussion about the disease that was presented. Ask students to recall the most important details of each

presentation, such as the name of the disease, its symptoms, transmission and prevention methods.

Wrap Up

As a class, discuss similarities and differences in how diseases are spread and how they can be avoided.

- Can students identify relationships between disease transmission and prevention?
- List as many healthy habits as the students can offer and discuss why the habits are beneficial.

Assessment

Have students:

- identify five healthy habits to prevent disease (**Part I**, step 6 and 12).
- identify the symptoms of diseases (**Part II**, step 4).
- identify transmission paths of diseases (**Part II**, step 4).

Extensions

Ask a doctor, nurse, health educator or health volunteer from a nearby clinic to speak to students about preventing, diagnosing and treating common diseases.

Research and create role plays about other common diseases. Make up songs with actions to demonstrate the best disease-prevention methods.

Resources

“Infectious diseases: How they spread, how to stop them.” Mayo Clinic. <http://www.mayoclinic.com/health/germs/ID00002> (accessed May 12, 2008).

www.mayoclinic.com/health/infectious-disease/ID00004 (accessed May 12, 2008).

“Cholera, Poliomyelitis, Shigella Dysenteriae, Typhoid Fever, Viral Hepatitis A.” Centers for Disease Control and Prevention. <http://www.cdc.gov> (accessed May 12, 2008).

“Health Topics.” World Health Organization. <http://www.who.int/topics/en/> (accessed April 2, 2008).

“Germs: Understand and protect against bacteria, viruses and infection.” Mayo Clinic. <http://www.mayoclinic.com/health/germs/ID00002> (accessed May 12, 2008).

Disease Cards—Resource Page

Bilharzia

Cause: The parasitic worms *Shistosoma mansoni* and *Shistosoma haematobium*

How do you get it?

- Vector transmission paths
- When skin comes in contact with freshwater containing snails carrying the *Shistosome* worms—wading, swimming, bathing or washing

Symptoms may include:

- Rash and/or itchy skin
- Fever
- Chills
- Cough
- Muscle aches
- Malnutrition

- Learning difficulties
 - Abdominal pain
 - Diarrhea
 - Blood in stools and/or urine
- How do you avoid it?**
- Avoid wading and swimming in freshwater (swimming in the ocean or treated pools is generally okay)
 - Be sure drinking water is safe to drink—bring to a boil for at least three minutes
 - Heat bath water to 66 degrees Celsius for five minutes or hold in storage tank for at least 48 hours before using for bathing
 - Visit a health care provider for preventative treatments
 - If symptoms occur, visit health care provider immediately for treatment

Cholera

Cause: The bacteria *Vibrio cholerae*

How do you get it?

- Fecal-oral transmission paths
- Direct and indirect contact transmission paths
- Cholera is spread where infected human feces comes in contact with food or drinking water, which are then consumed
- Also spread through personal contact

Symptoms may include:

- Symptoms may or may not be present
 - Severe watery diarrhea followed by severe dehydration
 - Vomiting
 - Leg cramps
- How do you avoid it?**
- Wash hands with soap and water after using the latrine and before preparing food
 - Be sure your drinking water is safe, especially after flooding when sewage and latrine overflow can mix with water
 - Pay attention to cholera warnings and make sure to boil water from areas where cholera contamination is known or suspected

Dysentery

Cause: The bacteria *Salmonella enterica*

How do you get it?

- Fecal-oral transmission paths
- Direct and indirect contact transmission paths
- Germs from infected feces come in contact with food or drinking water, which are then consumed

Symptoms may include:

- Vomiting.
 - Passing mucus in stools
 - Difficulty eating dairy products
- How do you avoid it?**
- Wash hands with soap and water after using the latrine and before preparing food
 - Be sure your drinking water is safe to drink
 - Before eating uncooked fruits and vegetables, wash them thoroughly with safe water

Hepatitis A

Cause: The Hepatitis virus

How do you get it?

- Fecal-oral transmission paths
- Direct and indirect contact transmission paths
- Germs from infected feces come in contact with food or drinking water, which are then consumed

Symptoms may include:

- Flu-like symptoms (fever, body aches, etc.)
 - Appetite loss
 - Nausea
 - Abdominal pain
- How do you avoid it?**
- Wash hands with soap and water after using the latrine and before preparing food
 - Be sure your drinking water is safe to drink
 - Before eating uncooked fruits and vegetables, wash them thoroughly with safe water

Malaria

Cause: The parasite *Plasmodium*

How do you get it?

- Vector transmission paths
- Parasites enter the human body through mosquito bites by infected female *Anopheles* mosquito, which mainly feed between evening and morning

Symptoms may include:

- Respiratory distress
- Shivering, feeling cold, chills
- Fever

- Headache
 - Nausea and vomiting
 - Seizures
 - Sweating
 - Tiredness
 - Body aches
- How do you avoid it?**
- Protection against mosquito bites—sleeping under a mosquito net, spraying of insecticides indoors
 - Remove stagnant standing water
 - Wear long sleeves and pants or skirts, especially in the evening.
 - Use insect repellent

Polio

Cause: The human Polio virus

How do you get it?

- Fecal-oral transmission paths
- Direct and indirect contact transmission paths
- Virus particles are excreted in feces for several weeks following initial infection
- Polio is a highly contagious disease (individuals are most infectious 10 days before and after symptoms appear)
- Polio is spread by personal contact and when infected human feces come in contact with food or drinking water, which is then consumed
- Mainly affects young children

Symptoms may include:

- Symptoms may or may not be present
 - Flu-like symptoms (fever, body aches, etc.)
 - Neck and limb pain and stiffness
 - Vomiting
 - In a small percentage of cases, Polio can cause paralysis (usually of the legs)
- How do you avoid it?**
- Get a series of vaccinations. The vaccine boosts the immune system’s ability to fight the virus that causes Polio
 - Wash hands with soap and water after using the latrine and before preparing food

Typhoid Fever

Cause: The bacteria *Salmonella typhi*

How do you get it?

- Fecal-oral transmission paths
- Direct or indirect contact transmission paths
- Germs from infected feces and urine come in contact with food or drinking water, which are then consumed

Symptoms may include:

- Persistent, high fever
 - Heavy sweating
 - Mild to severe diarrhea
- How do you avoid it?**
- Wash hands with soap and water after using the latrine and before preparing food
 - Be sure your drinking water is safe to drink, especially after flooding when sewage and latrine overflow can mix with water
 - Get a typhoid vaccination to boost your immune system’s ability to identify and kill the bacteria that causes typhoid fever

Don't Pass It Along

How can healthy habits make for a healthy handshake?

Subject Areas:
Science

Duration:
Warm Up: 15 minutes
Activity: 45 minutes
Wrap Up: 15 minutes

Setting:
Classroom

Skills:
Gathering (observing,
calculating)

Vocabulary:
indirect contact
transmission,
exposure, germs

Summary

Students learn how illness-causing germs can spread through contact and how healthy habits can stop them.

Objectives

Students will:

- develop awareness about the frequency with which they come in contact with people and objects.
- describe how germs may be spread through touch.
- demonstrate how, through both indirect and direct contact, one person can expose many to germs.
- identify ways to avoid spreading germs.

Materials

- A small amount of water
- Glitter, dirt or sand (optional)

Making Connections

Each person touches many things and people throughout a day. Each time we do, whatever is on our hands may be left on these things or people. We may not be able to see what we leave behind – or what we pick up from the surfaces we touch. Understanding that germs may be spread through simple contact with other people and objects can encourage healthy

habits, such as frequent hand washing.

Background

Germs, and associated diseases, can be spread by indirect contact. Indirect contact transmission refers to situations where a person is infected from contact with a contaminated surface. Some germs, including many that cause sanitation- and hygiene-related diseases, can survive on everyday objects for a long time.

Frequently touched surfaces are among the most likely places for spreading germs through indirect contact. These include:

- handles of doors and handrails.
- surfaces on any form of public transportation. (bicycles, motorcycles, buses, etc.).
- furniture, including chairs, tables and beds.
- kitchen items such as dishes, cups, forks, spoons, knives or trays.
- public telephones.
- mobile telephones and other electronics with buttons.
- computer equipment.
- shared school supplies.
- shared clothing and/or bedding.

Some diseases that can spread through indirect contact also can be transmitted by direct

contact, that is touching an infected person or infected bodily fluids.

Students should not be afraid to touch what others have touched, nor come in contact with other people. Emphasize that there are simple ways to stay healthy and avoid spreading illness from germs. These include:

- frequently washing hands with soap and water.
- covering the mouth with an arm instead of a hand when sneezing or coughing.
- cleaning surfaces that people frequently contact.
- not sharing eating utensils, food or drinks.
- keeping hands away from the mouth, nose and eyes.
- avoiding close contact with sick people.

Procedure

Warm Up

Open the discussion by asking students to estimate how many objects and people they touch in a day.

On the blackboard, list school objects students have touched that day. Read each item and ask students to raise their hands if they have touched it.

The list will contain duplicate items, such as benches, books, papers and pencils. Ask students if it is possible that some of them touched the same benches, books, papers and pencils. How many people do they think have touched

common items, such as the latrine door?

The Activity

1. **Demonstrate how germs can be passed along through touch by asking one student to cover his or her mouth with a hand and fake a sneeze, or do this yourself. Wet the student's hand (or yours) thoroughly with water.** (For visual impact, glitter, or a small amount of dirt or sand can also be used on the wet hand.) **Ask the student to shake hands with another student.** (If there are many students in the class, you may have more than one student start shaking hands with a wet hand, perhaps one for each row or two of benches.)
2. **Without drying hands between shakes, have the second student shake hands with a third student, the third with a fourth, and so on.**
3. **Allow the hand shaking to continue as long as students are shaking a damp hand. Ask students to inform you when the handshakes are dry, and stop the activity.** How many students shook a wet or damp hand? If you have split up the class into rows, ask students to report in separate rows. Sneezing is the body's way of relieving an irritation or
4. **Have all students who shook a damp hand stand on one side of the room and all others on the opposite side.** Ask students how many faked a sneeze (had their hands sprayed initially)? What if illness-causing germs were in the sneezed fluids? How many students now have been exposed to potential illness (how many had damp hands in the activity)?
5. **Discuss how the number of people exposed in a community can be large, even if the number of those ill and spreading**

tickle in the nose. A sneeze is not necessarily a sign of illness, but when a person has a cold or respiratory infection, the effects (swollen and irritated tissues) that the germs create can be the source of irritation that causes you to sneeze.

In this activity, if the sneeze were real and carried germs, those with damp hands would be exposed to the sneezer's illness. Being exposed to germs does not necessarily mean a person will become ill. A person's immune system can keep the body healthy by preventing many types of illness-causing germs from invading and multiplying in the body.

Hand Washing For Health

What is the simplest way to help stop the spread of disease?

germs is small.

6. **Ask students how germs on the hand get to the mouth?** Discuss the difference between direct contact (e.g., shaking hands with the sneezer) and indirect contact (e.g., handling a pencil the sneezer touched after sneezing).

Wrap Up

Return to the list of surfaces and objects the class created in the *Warm Up*. Do students think these are likely locations for spreading germs through indirect contact? Why or why not?

Ask students to suggest ways to prevent spreading germs.

Assessment

Have students:

- describe how germs can be spread through physical contact (steps 1 through 3).
- differentiate between direct and indirect contact (step 6).
- identify five locations or objects where germs are likely to be found (**Wrap Up**).
- identify ways to prevent spreading germs through contact (**Wrap Up**).

Extensions

Teach this activity to other students or members in your community and educate them about healthy habits.

Resources

“Methods of Disease Transmission,” Mount Sinai Hospital Department of Microbiology. <http://microbiology.mtsinai.on.ca/faq/transmission.shtml> (accessed April 2, 2008).

“Infectious diseases: How they spread, how to stop them, Germs: Understand and protect against bacteria, viruses and infection and Hand washing: an easy way to prevent infection.” Mayo Clinic. <http://www.mayoclinic.com> (accessed May 12, 2008).



Subject Areas:
Science, Health

Duration:
Warm Up: 30 minutes
Activity:
Part I: 45 minutes
Part II: 45 minutes
Part III: 60 minutes
Wrap up: 15 minutes

Setting:
Classroom or outdoor area

Skills:
Gathering (reading, listening, observing); Analyzing (comparing, discussing); Interpreting (defining problems); Applying (acting); Evaluating (assessing); Presenting (demonstrating, performing)

Vocabulary:
germs, molecule, tippy tap

Summary

Students learn a song to correctly practice the healthy habit of hand washing.

Objectives

Students will:

- identify the benefits of using soap for hand washing.
- learn a song that can serve as a timer for healthy hand washing.
- recognize and perform proper hand washing techniques.
- identify when it is important to wash hands.
- develop and reinforce the healthy habit of frequent hand washing.
- build a simple hand washing station that can be used at school or at home.

Materials

- Small amount of dirt
- Two clear containers
- Soap
- Rinse water container
- Soap Story Cards – Resource Page**
- Hand Washing for Health – Resource Page**
- Lyrics of the **Hand Washing Song** written on board
- Clean water
- One large water container with a handle and a cap (one

to four liters)

- Three pieces of cord, the length of an adult's arm
- A bar of soap
- Small plastic water bottle (one-half to one liter)
- Knife
- Hammer
- Nail

Making Connections

Many students recognize that washing their hands is important. However, some may not know when, how or why to do it. Hands-on practice and a song can help students further develop the healthy habit of frequent hand washing.

Background

Hand washing is the simplest, most effective way of preventing germs from spreading. Proper hand washing helps remove germs that cause disease, stopping many diseases from spreading through indirect and direct contact.

Washing hands with soap and water for at least 15 seconds removes many germs. Washing with only water provides little benefit.

Soap consists of long molecules that help to remove oil, dirt and germs. One end of the molecule is attracted to water. The other is repelled by water molecules, but attracted to grease and dirt. Soap removes grease and soil

from the hands. Friction from the motion of rubbing hands together pulls more dirt and grease free from the skin. Rinsing washes away the suspended dirt and grease, along with the germs.

If soap is not available, using a different rubbing agent, such as ash, and rinsing thoroughly may clean as well as soap. Ash works well because it is sterile and coarse; vigorous rubbing creates friction which helps scrub germs away.

Wash and rinse hands with clean water. If running water is not available, a barrel with a tap that can be turned on and off, a pitcher and basin, or a Tippy Tap (part III) are alternatives that can provide the water flow to rinse thoroughly.

Drying hands on dirty towels, clothing, or other objects can quickly re-contaminate. Shaking hands dry is a better way to avoid picking up new germs.

Procedure

Warm Up

Ask students why hand

washing is important. What items do they need for healthy hand washing? Tell students they are going to participate in an investigation. You will wash your hands using three different methods, and they will decide which method is the most effective.

- **Method 1:** Rub some dirt on your hands. Hold them over a basin, and ask a student to pour water over them. Ask students to inspect your hands. Are they clean? (Dirt should still appear on your hands.)
- **Method 2:** Rub more dirt on your hands. Apply soap, but do not rub your hands together. Hold your hands over a basin, and ask a student to pour water over them. Ask students to inspect your hands again. Are they clean? (Some dirt will still cling to them.)
- **Method 3:** Rub dirt on your hands a third time. Use soap and water according to the [Hand Washing Diagram](#) and scrub

vigorously while students count to 15. Hold your hands over a basin, and ask a student to pour water over them. Ask students to inspect your hands. Are they clean?

Ask students to identify which hand washing method was the most effective. Why? (The most effective hand washing involves soap, clean water and vigorous rubbing that produces friction dislodging dirt and grease from your hands.) Be sure to emphasize that Method 3 is the best method for proper hand washing.

The Activity

Part I

1. **Ask students when they think it is important to make sure their hands are clean. Remind them that disease can be transmitted in many ways. Ask them to suggest different ways hands could transmit diseases.** These may include direct contact with people, dirty surfaces, (such as toilets), feces and animals. Sneezing or coughing into a hand and putting dirty hands in your mouth when eating or preparing food are other ways hands can spread disease. List student ideas on the board and reinforce that hand washing with soap and clean water is one of the most effective ways to

prevent spreading disease.

2. **Have the class perform a demonstration using the Soap Story Cards. Divide the class into four groups and assign roles:**
 - **Group 1:** Dirt
 - **Group 2:** Water
 - **Group 3:** Soap
 - **Group 4:** Rinse water
3. **Hand each group a Soap Story Card and allow group members to review it.** Designate one student from each group to read the group's "role" to the class.
4. **Ask each group to come to the front of the room in the following order: dirt, water, soap, rinse water.** For example, the dirt group gets in "position," the "role" is read, and the group performs the "action." Then ask the water group to come to the front and perform their "action" by interacting with the dirt group. Next the soap group will come to the front and perform their "action" by interacting with the dirt and water groups. Finally the rinse water group will come to the front and perform their "action" by interacting with the dirt, water, and soap groups.
5. **After all groups have performed their actions, ask students to review why washing with soap and water is effective.**

Part II

1. **Tell students that in addition to washing with soap and water, the length of time spent hand washing is critical.**
2. **Teach students *The Hand Washing Song*, sung to the tune of *Frere Jacques*.** This simple song lasts about 15 seconds, so it can be sung during hand washing to remind students to wash each part of their hands and make sure they wash long enough.
3. **Have each student look at the *Hand Washing Diagram*, and practice proper hand washing techniques, pretending to use soap and water.**
4. **As they practice the techniques on the diagram, ask the class to sing the *Hand Washing Song* again or count 15 seconds.** This is the amount of time they should spend washing their hands, excluding time for preparing, rinsing, or drying.

Part III

1. **Ask students to talk about whether there are any hand washing stations at school or in their communities.**
2. **Have the students come up with ideas about where they think it would**

The Hand Washing Song

Sing this to the tune of Frere Jacques. This song lasts about 15 seconds.

Lather with soap

Rub your palms together

Now the backs

Of your hands

Interlace your fingers

Cleaning in between them

Now the thumbs

Clean your nails

be important to have a hand washing station. Ask them why they chose these locations.

3. **Use the *How to Construct a Tippy Tap* resource page to build a simple hand washing station with the class.** You may also construct one ahead of time and use it for demonstration. Using the student's suggestions choose a proper location to hang your Tippy Tap.
4. **After the hand washing station is complete have the students line up and practice proper hand washing.** Encourage the class to sing *The Hand Washing Song* or count 15 seconds while each student washes their hands.
5. **Have the students come up with suggestions on how they could improve the design of the Tippy**



Hand washing is one of the most effective ways of preventing germs from spreading.

Tap. They can also suggest other materials that could be used if they do not have access to the materials listed on the resource page.

6. **Encourage students to ask an adult to help them build a hand washing station at home or in their community.**

Wrap Up

Discuss hand washing with the class. What are some obstacles we may have to overcome to wash our hands often? How do we eliminate these obstacles? What are the benefits of hand washing with soap and clean water? How can we teach others in our community about these benefits?

Assessment

Have students:

- identify important times for hand washing (**Part I**, step 1).
- explain why using soap is important (**Warm Up**, **Part I**, step 4).
- practice proper hand washing techniques (**Part II**, steps 3 and 4, **Part III**, step 4).
- Identify important locations for hand washing stations (**Part III**, step 2).

Extensions

Have students create a hand washing educational campaign for the school or community.

Use strategies like songs, posters and poems to teach others about proper hand washing. Older students also can teach younger students the hand-washing song.

Make additional Tippy Taps to provide hand washing stations for your school or students' homes. Refer to the *How to Construct a Tippy Tap – Resource Page* for instructions on how to build a Tippy Tap.

Resources

“Hand washing Facilities in Schools, Tool Kit on Hygiene, Sanitation & Water in Schools.” World Bank. <http://www.schoolsanitation.org/BasicPrinciples/HandwashingFacilities.html> (accessed April 2, 2008).

“News and educational materials on hand hygiene from the Soap and Detergent Association.” The Soap and Detergent Association. <http://www.cleaning101.com/hand-hygiene/> (accessed April 2, 2008).

www.cleaning101.com/hand-hygiene/ (accessed April 2, 2008).

“The Hand Washing Handbook.” The Global Public Private Partnership for Handwashing. http://www.eddcontrol.org/files/Handwashing_Handbook_WB.pdf (accessed April 2, 2008).



Children with clean hands

Soap Story Cards – Resource Page

**Group 1
Dirt**

Position

Line up along the wall at the front of the classroom.

Action

Pretend you're clinging to the wall.

(As the other groups move in, go wherever one of their members moves you.)

WALL



Role

We are dirt and germs, clinging to your hands. We like it here!

**Group 2
Water**

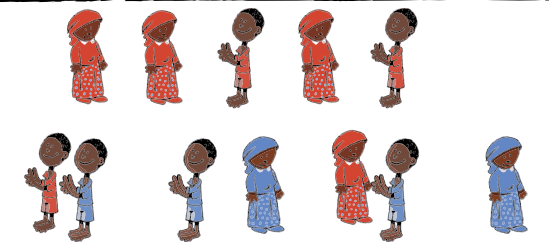
Position

Make a line in front of the students in the Dirt Group. Stand parallel to their line, about a meter away.

Action

Two water group students each select one of the students from the Dirt Group to join the water group.

(As the other groups move in, listen to them and act out what their part of the story tells you to do.)



Role

We are the water you used to wet your hands. We remove some of the dirt and germs clinging to your hands.

**Group 3
Soap**

Position

Line up in front of the students in the Water Group. Stand parallel to their line, about a meter away.

Action

Wiggle between the students in the water group. Take one of the water group members by the hand. Then use your other hand to take one of the Dirt Group members by the hand. Pull the Dirt Group members away from the wall.

(When the Rinse Water Group moves in, allow yourself to be carried along with them.)



Role

We are soap. Each of us is a long molecule. One end is attracted to the water. The other is attracted to dirt and germs. We pull the dirt and germs from your hands.

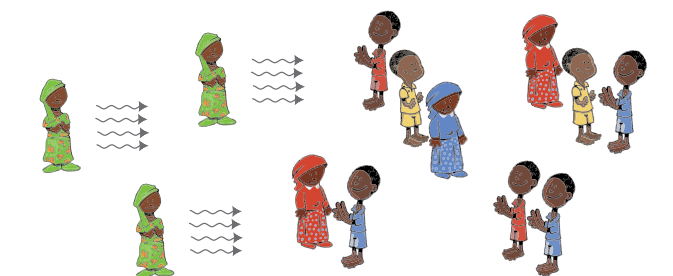
**Group 4
Rinse Water**

Position

Grouped together at one side of the classroom.

Action

In a group, hurry across the front of the classroom from one side to the other, taking all the other groups with you.



Role

We are the rinse water. We rush over your hands, washing away dirty water, soap, dirt, and germs in a big flood!

Hand Washing For Health—Resource Page

When should we wash our hands?

Before

- Preparing food
- Eating
- Taking medication or giving it to someone
- Taking care of a wound
- Going to bed

After

- Using the toilet or latrine
- Taking care of animals
- Wiping your nose
- Helping a child on the toilet, or changing a baby
- Caring for someone ill
- Handling raw meat

How to wash your hands

1. Get ready

Have soap and clean water ready. Store soap where it can drain, so it does not sit in a pool of water,

which can waste soap and encourage germ growth.

Remove jewelry and roll up sleeves to the elbow.

Wet hands and wrists.

Keep your hands lower than your elbows as you wash, so water flows to your fingertips rather than up your arms.

2. Wash!

Apply soap to your hands and lather thoroughly.

Use firm, circular motions to wash hands and arms up to the wrists, covering all areas, including palms, back of the hands, fingers, between and sides of fingers, knuckles, and wrists.

Wash hands for at least 15 seconds.

Repeat the process if your hands are very soiled.

Clean under your fingernails.

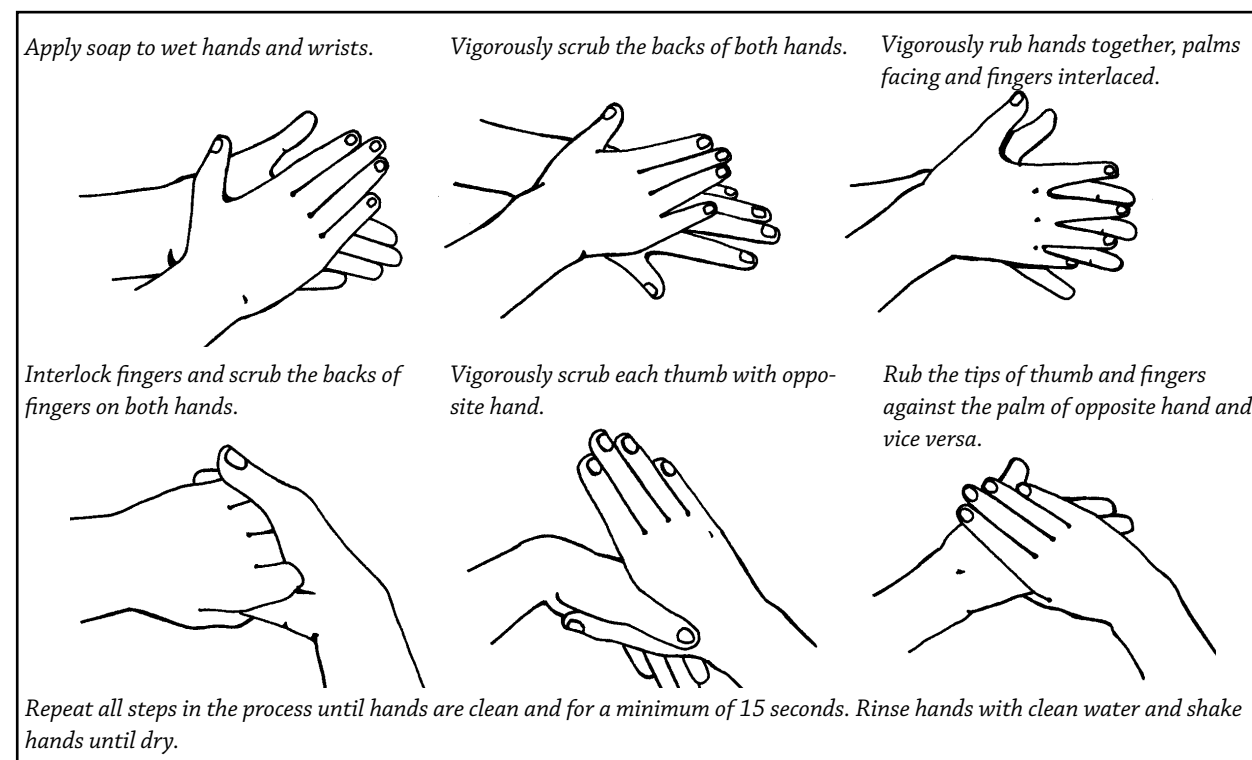
3. Rinse

Rinse your hands using running water, if possible. If not available, use a bucket with a tap that can be turned on and off, a pitcher and basin or bucket, or a Tippy Tap.

Do not dip your hands into a basin of water to rinse them. The water will quickly contain dirt and germs that could re-contaminate hands.

4. Dry

Shake your hands dry to avoid picking up new germs from your clothing or towels.



Hand Washing Diagram

How to Construct a Tippy Tap—Resource Page

Materials

- One large water container with a handle and a cap (one to four liters)
- Three pieces of cord, the length of an adult's arm
- A bar of soap
- Small plastic water bottle (one-half to one liter)
- Knife
- Hammer
- Nail

Location

Choose a location that is convenient for use, such as near the latrine at your school or home or near where you prepare food. You will need to either construct something from which to hang your Tippy Tap or utilize a tree branch. Choose a location that is prominent so that the Tippy Tap is used frequently. Remember to keep soap replenished and available to those who use the Tippy Tap.

Instructions

Ask an adult to help you.

Large Water Container

1. Using boiled water, clean the inside of one large water container. Fill the container half full with clean water.
2. Use a hammer and nail to put 8-12 holes in the cap of the large water container. Place the cap back on the container.

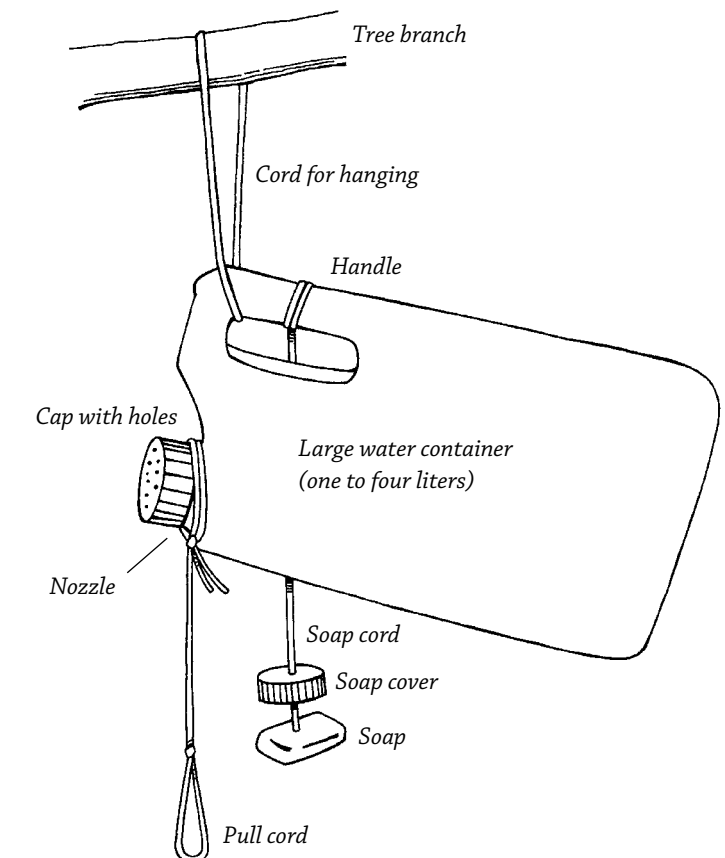
Soap Cover and Soap Hanger

3. Bore a hole through the middle of the soap using a nail or knife. The hole should be large enough to thread a piece of cord.
4. Make a hole in the bottom of the small (one half to one liter) plastic bottle. Using the knife cut off the bottom of the small bottle.
5. Tie a knot at the end of one piece of cord. Thread the bar of soap onto the cord. Tie a second knot above the bar of soap. Thread the soap cover (from the small plastic bottle that was cut in half in step #4) onto

the cord. This provides a cover for the soap. Set aside.

Securing Your Tippy Tap

6. Use one piece of cord for hanging the container. Tie one end of the cord around the handle and tie the other end securely to a branch or log.
7. Use a second piece of cord as a pull cord to tip the Tippy Tap. Tie one end of the cord around the nozzle. Tie a loop large enough to be a handle in the other end. You may also tie this end around a log to use as a foot pedal for tipping the Tippy Tap.
8. Tie the cord with the soap and soap cover to either the handle of the water container or from the branch or log where the Tippy Tap is hanging.
9. You are now ready to wash your hands with soap and water using the Tippy Tap!



Break the Chains

What healthy habits can break the chain of infection?

Subject Areas:

Science, Health

Duration:

Warm up: 45 minutes

Activity: 45 minutes

Wrap up: 20 minutes

Setting:

Classroom

Skills:

Gathering (reading, listening); Analyzing (identifying components and relationships among components); Interpreting (relating, making models, identifying cause and effect); Presenting (demonstrating)

Vocabulary:

Bilharzia, cholera, dysentery, feces, fecal-oral transmission, hepatitis A, malaria, parasite, polio, typhoid, vector transmission

Summary

Students use problem-solving skills to discover how to break the chains of disease transmission.

Objectives

Students will:

- describe transmission pathways of common water- and sanitation-related illnesses.
- identify personal and community actions that can prevent or contribute to spreading disease.

Materials

- Disease Transmission Chain Cards – Resource Page** for each of seven groups
- Chalkboard

Making Connections

Understanding the different transmission paths helps students learn how healthy habits can decrease the possibility of spreading disease.

Background

Diarrheal diseases are among the most dangerous in Africa. Although these diseases use many paths to spread, many can be controlled by using healthy habits. Simple individual actions like washing hands properly, water treatment and basic sanitation can make entire communities healthier.

A primary cause of most diarrheal diseases is fecal-oral transmission. Germs enter the body when human or animal feces contaminate food or water. These germs or microorganisms multiply in the digestive system and are shed from the body in human and animal feces.

Proper sanitation, and hygiene along with healthy habits, can keep both animal and human feces out of water supplies. Many steps can be taken to keep diseases from spreading through fecal-oral transmission. For example:

- Frequently wash your hands with soap and clean water. (This is one of the most effective ways to stop spreading disease).
- Tether animals away from water sources so their waste does not contaminate the water.
- Construct your latrine away from water sources to avoid contamination by human waste.
- Maintain the latrine properly; if one is unavailable, dig a hole and cover your waste with dirt.
- Boil drinking water. (This can kill many germs from fecal and other types of contamination.)
- Get vaccinated. This can boost natural immune defenses against many

diseases, including some fecal-oral diseases, such as polio.

Vector disease transmission is another way in which disease is spread. Vector transmission involves contact with insects or other animals that transmit disease. Malaria and Bilharzia are examples of diseases that are spread through vector transmission. There are many steps that can be taken to keep diseases from spreading through vector transmission. For example:

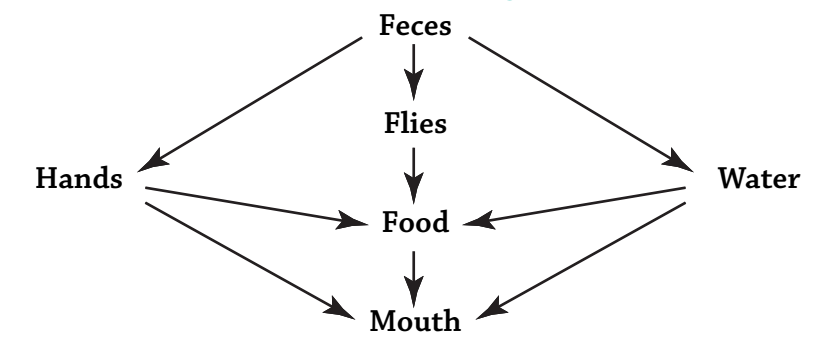
- Sleep under a mosquito net at night. The *Anopheles* mosquito feeds at night and can spread the malaria parasite from person to person.
- Remove stagnant water from around your home. This will help keep the *Anopheles* mosquito from laying her eggs near your home.
- Avoid swimming and wading in freshwater. The Bilharzia parasite is found in contaminated freshwater.
- Heat bath water to 66 degrees Celsius for at least 5 minutes before bathing. This can kill parasites that are passed through vector transmission to your skin.

Procedure

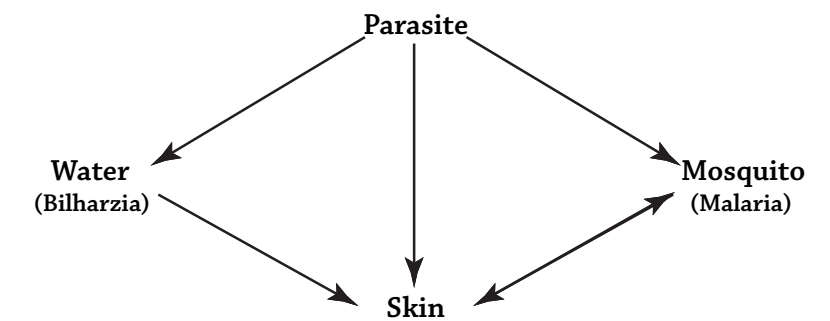
Warm Up

To explain how germs and disease can spread, copy the two disease webs onto the board and explain to students the pathways diseases can travel.

Disease Web Diagram



This diagram illustrates possible scenarios for fecal-oral disease transmission.



This diagram illustrates possible scenarios for vector disease transmission.

The following three examples illustrate the fecal-oral route of transmission:

- A person who uses the latrine, but does not wash her hands afterward, goes to the kitchen to prepare food. This allows germs on her hands from the latrine to contaminate the food. When this food is consumed, so are the germs.
- Flies are attracted to feces. The fly may have carried germs from the feces in the latrine onto your food. When you consume your food, you can also consume germs from the latrine.
- Your goats defecate in the spring that provides your drinking water. This introduces germs into your water supply. When

you collect water from this contaminated source and do not boil it before drinking, you can consume the germs from the goats' feces.

The following two examples illustrate the vector route of disease transmission.

- A person collects bath water from a contaminated fresh water source. They do not heat their bath water before using it allowing parasites from the water to transmit disease through contact with their skin.
- At night, an *Anopheles* mosquito bites and infects you with the malaria parasite. You become infected and begin to show symptoms of the disease. If an *Anopheles* mosquito

Disease Transmission Chain Cards—Resource Page

bites you again she can carry the malaria parasites from you and pass them on to other people she bites.

Healthy habits can break the transmission chains and stop spreading of germs and disease. Boiling water before drinking, frequent hand washing with soap and sleeping under a mosquito net are some of the most effective ways to break the transmission chains.

The Activity

1. Explain the diagram describing a disease's transmission path to your students.
2. Ask seven students to volunteer as team leaders. Give each team leader one of the seven Disease Transmission Chain Cards. You may want to remove the Best Methods of Prevention section of the cards before handing out to students.
3. Allow each student group 10 minutes to think of actions that could break the transmission chain for each disease. Have them consider healthy habits that they are familiar with as options.
4. Ask a volunteer from each group to show the class the group's results. If there are prevention methods the groups did not

consider, ask the other students to contribute ideas. Reference the *Best Methods of Prevention* for each disease in the *Disease Transmission Chain Cards – Resource Page* for more information.

Wrap Up

Discuss habits that can help the class stay healthy. Can they think of healthy habits besides those in the activity? Emphasize that students can do a lot to stay healthy, and help their school-mates, families and communities break disease transmission chains.

Assessment

Have students:

- diagram how disease-causing germs can spread from feces to people (**Warm Up**).
- diagram how disease can be spread through insects or animals to people (**Warm Up**).
- identify actions that spread germs and disease and how they relate to a specific part of the disease transmission paths (step 3).
- identify healthy habits that can stop the spread of germs and disease (Steps 3 and 4, **Wrap Up**).

Extensions

Create a “Break the Chain” campaign to promote sanitation and hygiene. Have students make posters and display them around their school and community.

Have students dramatize the activity and perform it for others, emphasizing healthy habits.

Have students adapt the activity to other diseases with different transmission routes, such as HIV/AIDS. For each disease, ask students to identify the transmission chain and healthy habits that break it.

Resources

“Health Impacts of Improved Sanitation.” WELL Fact Sheet. <http://www.lboro.ac.uk/well/resources/fact-sheets/fact-sheets-htm/Household%20Sanitation.htm> (accessed April 2, 2008).

“Hepatitis A.” Virginia Department of Health. http://www.vdh.virginia.gov/epidemiology/factsheets/Hepatitis_A.htm (accessed April 15, 2008).

“Cholera.” Department of Health and Human Services Centers for Disease Control and Prevention (CDC). Division of Foodborne, Bacterial and Mycotic Diseases (DFBMD). http://www.cdc.gov/nczved/dfbmd/disease_listing/cholera_gi.html (accessed April 15, 2008).

“Hygiene Education.” WaterAid America. http://www.wateraid.org/uk/what_we_do/how_we_work/sustainable_technologies/technology_notes/238.asp (accessed May 14, 2008).

<p>Bilharzia – A disease caused by parasitic worms that is spread when skin comes in contact with contaminated freshwater. Eggs of the parasite can be introduced to freshwater through the urine and feces of infected people.</p> <pre> graph LR Parasite --> Water Parasite --> L1[1st Link] Water --> Skin Water --> L2[2nd Link] </pre>	<p>Best Methods of Prevention: Bilharzia Avoiding wading and swimming in freshwater, properly heating or storing bath water and boiling drinking water.</p>
<p>Cholera – A bacterial disease that causes massive, highly liquid diarrhea, which has very high concentrations of the cholera bacteria.</p> <pre> graph LR Feces --> Water Feces --> L1[1st Link] Water --> Mouth Water --> L2[2nd Link] </pre>	<p>Best Methods of Prevention: Cholera Proper hand washing with soap and water, boiling drinking water and isolation of cholera-infected water, clothing and bedding.</p>
<p>Dysentery – A symptom of a disease that causes the body to eliminate feces. Bacterial and viral germs can spread through the feces.</p> <pre> graph LR Feces --> Water Feces --> L1[1st Link] Water --> Mouth Water --> L2[2nd Link] </pre>	<p>Best Methods of Prevention: Dysentery Boiling drinking water and proper hand washing with soap and water.</p>
<p>Hepatitis A – A viral disease that infects the human liver and spreads through fecal-oral transmission or sexual contact.</p> <pre> graph LR Feces --> Water Feces --> L1[1st Link] Water --> Mouth Water --> L2[2nd Link] </pre>	<p>Best Methods of Prevention: Hepatitis A Boiling drinking water and proper hand washing with soap and water.</p>
<p>Polio – A viral infection spread through infected feces or mouth-to-mouth contact.</p> <pre> graph LR Feces --> Water Feces --> L1[1st Link] Water --> Mouth Water --> L2[2nd Link] </pre>	<p>Best Methods of Prevention: Polio Vaccination, proper hand washing with soap and water, boiling drinking water, and avoiding kissing or sharing drinking or eating utensils with an infected person.</p>
<p>Malaria – A disease caused by a parasite that is transmitted to humans through <i>Anopholes</i> mosquitoes. Mosquitoes breed in standing water.</p> <pre> graph LR Parasite --> Mosquito Parasite --> L1[1st Link] Mosquito --> Skin Mosquito --> L2[2nd Link] </pre>	<p>Best Methods of Prevention: Malaria Sleeping under a mosquito net, wearing protective clothing at night and removing stagnant water from around your house.</p>
<p>Typhoid Fever – A bacterial disease that multiplies in your bloodstream and spreads through feces.</p> <pre> graph LR Feces --> Water Feces --> L1[1st Link] Water --> Mouth Water --> L2[2nd Link] </pre>	<p>Best Methods of Prevention: Typhoid Fever Boiling drinking water and proper hand washing with soap and water.</p>

The Path to Healthy Drinking Water

If you doubt your water is clean – boil it!

Subject Areas:

Science, Health, Mathematics

Duration:

Warm Up: 45 minutes

Activity:

Part I: 30 minutes

Part II: 30 minutes

Part III: 45 minutes

Wrap Up: 30 minutes

Setting:

Classroom, outdoor area near school water source

Skills:

Gathering (observing, listening, measuring, recording, calculating); Organizing (estimating, drawing, manipulating materials); Analyzing (discussing); Applying (planning, constructing); Evaluating (assessing), Presenting (demonstrating, reporting)

Vocabulary:

microorganism, sediment, filtration

Summary

By understanding how to treat water in their own homes, students contribute to their health, as well as that of their families and communities.

Objectives

Students will:

- recognize that certain personal and household activities require clean water.
- explain why their senses are not sufficient to test whether water is safe to drink.
- explain the best way to purify drinking water.
- analyze home water systems and identify potential improvements.

Materials

- Four clear plastic bottles with holes in the lids
- Clean drinking water
- A pen to label bottles
- Small amount of salt
- Small amount of white vinegar or clear soda
- Small amount of dirt
- Copies of **Steps Along the Path to Healthy Drinking Water – Resource Page**, or one large version to post for the class
- Large sheets of paper

- Colored pencils or other writing implements

Making Connections

Most students know the source of their household water.

While some activities, such as drinking, food preparation and hand washing, require clean water, others do not. Learning the steps toward providing healthy drinking water can help students, their households, and communities avoid spreading disease.

Background

Many households and communities lack healthy drinking water. People use contaminated drinking water for many reasons, including:

- limited/no access to water.
- inability to pay for water fees or tariffs.
- lack of information to determine their water supply's safety.
- lack of knowledge of water treatment and storage methods.

Contaminated water and food causes significant health problems across Africa, and around the world.

According to the World Health Organization: "Worldwide, contaminated water helps make more than three billion people sick and contributes to five million deaths annually.

The estimated death rate for children from these diseases is one every eight seconds."

Having a water source or supply near home does not guarantee it's safe to drink. Clean water sources may become contaminated periodically by natural events, such as flooding or drought. Water treatment may be unavailable or poorly managed. Even water from a well can be contaminated, depending on the quality of ground water.

Even when the water source is clean, water can become contaminated during collection, transportation, storage or use.

Many methods of water purification exist and all have advantages and disadvantages including cost, availability, effectiveness, etc. Vigorously boiling your drinking water for at least three minutes kills bacteria, parasites and viruses and is the most effective way to make drinking water safe. This process can significantly reduce diarrheal and water-borne diseases and improves family and community health.

Procedure

Warm Up

In advance of the *Warm Up*, pour equal amounts of clean water into four clear bottles. Number each bottle. This activity works best if holes are made in the bottle lids to allow students to use their sense of smell (holes can be

made prior to the activity using a hammer and nail).

To bottle number one add a small amount of salt and shake to dissolve (be sure to cover the holes in the lid when shaking). To bottle number two add a small amount of white vinegar or clear soda (enough so that you can smell the vinegar or soda). To bottle number three add a small handful of dirt. Do not add anything to the water in bottle number four. Line the bottles up on a table at the front of the room.

To begin the *Warm Up*, ask students how they can tell if our drinking water is healthy. Without using water testing equipment, what do we have available to us to determine if drinking water is clean. List student answers on the board.

Ask students to identify their five senses (sight, smell, taste, touch and hearing). Can they use any of their senses to help them decide if water is healthy to drink? **Do not taste or have students taste any water in this investigation.**

Tell them we are going to conduct tests to see if our senses are adequate water testing tools.

Show the class the four bottles of water. Ask the students if, through observation, they know this water is healthy to drink? Explain to the students that only one of the four

bottles contains clean drinking water. Ask them to use their senses (except for taste) to try to determine which bottle contains clean drinking water. Provide slips of paper and pens or pencils and ask the students to write down the number of the bottle that they think is clean water and their name. Students can fold their slip of paper and make a pile of guesses. After everyone has had a chance to guess, determine how many students guessed correctly and read their names aloud.

Explain to students that just because water appears clear and clean does not mean that it is healthy to drink. For example, you cannot see the salt in the water of bottle #1. Why? (Salt dissolves in water.) Ask students if it is possible there are other things in the water they cannot see. (Germs and microorganisms can be present in water but only seen with a microscope.)

Ask students if observing (without special tools) is sufficient to determine if water is healthy to drink.

What can students do to ensure their drinking water is healthy?

Remind students the most effective way to ensure water is healthy to drink is to purify it. Boiling is the simplest method of purification for making water healthy to drink.

The Activity

Part I

1. Divide the class into groups of six students. Ask each group to form three pairs of two. Instruct the groups to have each pair focus on a different one of the three purification methods from the **Steps Along the Path to Healthy Drinking Water** resource page.
2. Have each pair present the purification method they studied to their group through a demonstration, explaining how and why the methods work. Each group should discuss and debate the advantages and disadvantages of each method.
3. Have each group of six students decide which method of purification they would prefer to use in their homes to ensure their drinking water is healthy.

Part II

1. Draw a long line (30m or so) in the dirt in the school yard. You could also do this activity in a classroom with an imaginary line, or a line made from desks, pencils, etc. This line will represent the path to healthy drinking water.
2. Make a sign (or write in the dirt) at one end of

the line “Step 1: Water Source”, or, if there is a water source in the school yard (like a pump), start the line there.

3. Explain to the students that they are about to follow the path to healthy drinking water. Gather the students at the start of the line. Explain that this point represents the place where they collect water—their water source. Ask them to think about whether or not the water collected here is clean. Ask them to reflect on the **Warm Up**—is it possible to tell if the water is clean by observing it?
4. Move the group along the line. Explain that this movement represents transporting the water home.
5. Stop somewhere along the center of the line. This point represents the part of the path to healthy drinking water where the water is purified and should be labeled “Step 2: Water Purification”. There are many options for purifying water. This activity focuses on three common and relatively inexpensive options—boiling, chemical treatment and solar water disinfection. Have students recall their discussions about

different methods of water purifications from part one and discuss which method they would choose to use in their own homes.

6. Now move the group along the line again—purifying their water has moved them further down the path toward healthy drinking water. About three-quarters of the way to the end of the line, stop the group. This point should be labeled “Step 3: Safe Storage of Clean Water”. At this point, use the information on the “Safe Storage of Clean Water” card to lead a discussion with the students about the importance and methods for clean water storage.
7. Move the class to the end of the line. At this point the water is clean, healthy and ready to drink. However, if the water is now poured into a dirty glass, all the work they have just done to keep their water clean is wasted. The end of the line should be labeled “Step 4: Handling of Clean Drinking Water”. At this point, use the information on the “Safe Handling of Clean Water” card to lead a discussion with the students about the importance and methods of clean water handling.

Part III

1. Using the ideas addressed in Part II of this activity, students should create a “Path to Healthy Drinking Water” poster illustrating their own personal path to healthy drinking water. They should be sure to include the source where their water comes from, how they choose to purify their water, how they safely store their water, and how they safely serve the clean water. Have students take this poster home to share with their families to encourage following the path to healthy drinking water in their home.

Wrap Up

Discuss whether students’ families use purified water at

home. If so, which methods do they use? If not, do they think some of the methods demonstrated would work at home? Why or why not? How would they put these methods into practice?

Assessment

Have students:

- explain why observation may not be sufficient to judge the safety of drinking water (**Warm Up**).
- explain different methods of water purification (**Part I**, steps 2-3, **Part II**, step 5, **Part III**)
- identify the steps along the path to healthy drinking water (**Part II**, step 1-7, **Part III**).
- identify how water is purified and stored at home and suggest ways to

improve these methods (**Wrap Up**).

Extensions

Research other filtration methods (e.g., slow sand filters and silver impregnated filters). Explain how and why they work. If possible, construct a model.

Resources

“Household Water Treatment, Storage and Handling.” WELL Fact Sheet. <http://www.lboro.ac.uk/well/resources/fact-sheets/fact-sheets-htm/Household%20WT.htm> (accessed April 2, 2008).

“Household Water Treatment.” WELL Technical Brief. <http://www.lboro.ac.uk/well/resources/technical-briefs/58-household-water-treatment-1.pdf> (accessed April 2, 2008).

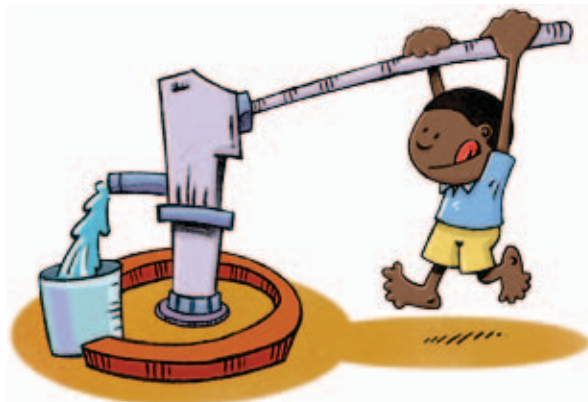
“Water Treatment Methods.” Centers for Disease Control and Prevention. <http://www.cdc.gov/travel/content/Water-Treatment.aspx> (accessed May 15, 2008).



To ensure water is safe to drink, it must be drawn, transported, treated, stored and retrieved with care.

Steps Along the Path to Healthy Drinking Water

Step 1: Water Source



Step 2: Water Purification



Step 3: Safe Storage of Clean Water



Step 4: Safe Handling of Clean Water



Boiling

How it works

The Centers for Disease Control and Prevention state, "Boiling water is the best method for making water safe to drink. Boiling water as recommended will kill bacterial, parasitic, and viral causes of diarrhea." Heat water in a pot until it boils vigorously and keeps boiling for at least three minutes. Water is boiling fully when it is moving in fast, rolling waves of bubbles, and the pot is releasing steam. (Above 1,600 meters, increase boiling time to five minutes, adding one minute for each additional 300 meters.) Cover the pot and cool the water in a safe place before pouring it into covered containers for storage. Clean the storage containers and their lids with boiling water to kill any germs. Store boiled water separately from un-boiled water. If you don't like the taste of boiled water, add a pinch of salt.

Why it works

The high temperature of boiling water kills bacteria, parasites and viruses.

Advantages

- Kills harmful bacteria and other disease-causing germs
- Simple
- Easy to use a fire for boiling water after preparing meals

Limitations

- Requires fuel, such as firewood, charcoal, a solar cooker, or gas stove, making it too expensive for some households
- Takes time to gather fuel, boil water, and cool for storage
- Boiling affects water's taste

Chemical Treatment

How it works

A small amount of chemical (sodium hypochlorite or calcium hypochlorinate in a pre-packaged solution) is added to drinking water in a container about 30 minutes prior to consuming. Consumers can purchase a small bottle of the product from shops or pharmacies and then add the appropriate amount for the volume of water, stir and let stand for the amount of time indicated on the packaging of the product. Various brands of chemical treatments are available (e.g. PUR™ and WaterGuard™).

What it does

The chemical kills many of the bacteria and parasites which can cause diarrhea.

Advantages

- Relatively inexpensive
- Relatively easy to use

Limitations

- Taste of water
- Ineffective against some parasites

Solar Water Disinfection

How it works

Small quantities of untreated water are placed in clean, clear, non-scratched PET or glass bottles closed with lids and set in direct sunlight for at least six hours. Bottles used for solar water disinfection must be clear (not brown or green), PET plastic (not PVC plastic) or glass and hold less than three liters of water. Bottles must be placed horizontally (on their sides) in the sun.

What it does

UV-A rays from the sun kill bacteria and parasites in the water making it safer for consumption.

Advantages

- Relatively affordable
- Materials available
- Relatively easy

Limitations

- Not as effective when sun is obscured by clouds (if half of sky or more is covered by clouds, bottle must be left in the sun for 48 hours consecutively)
- Not as effective with turbid water

Safe Storage of Clean Water

Clean water must be stored safely to prevent recontamination. To safely store water in an open storage pot:

- Cover the storage pot when you are not drawing water
- Use a clean lid and put a rock on top if the lid falls off easily
- Clean the storage pot well using clean water (boiling water is best) before refilling it with clean water. Allow time for it to dry completely

A closed storage system is safer. It allows you to pour out water or use a tap at the bottom. The storage vessels can be anything from a narrow-necked jar to a jerry can or a pot with a small tap at the bottom.

- Clean the storage vessel well using clean water (boiling water is best) before refilling
- If you cannot scrub the inside of the vessel easily (as with a jerry can), clean the vessel by shaking pebbles inside with a solution of soap and clean water or disinfectant and water

Safe Handling of Clean Water

Water that has been purified and stored safely can be recontaminated at the point of use.

Do not dip a communal drinking cup into the water because fingers touching the cup or the water can introduce germs. Draw water from the storage pot only with a long-handled ladle and pour the water into your drinking cup. Touch only the handle of the ladle, and keep your fingers and the ladle handle out of the water.

A closed storage system is safer. It allows you to pour out water or use a tap at the bottom. The storage vessels can be anything from a narrow-necked jar to a jerry can or a pot with a small tap at the bottom.

Finding Healthy Water Sources

The quality of your water starts with the cleanliness of the source!

Subject Areas:
Science, Health

Duration:
Warm Up: 20 minutes
Activity:
Part I: 45 minutes
Part II: 60 minutes
Wrap Up: 30 minutes

Setting:
Classroom, school yard/
school drinking water
source

Skills:
Gathering (observing,
recording); Organizing
(mapping); Analyzing
(identifying components
and relationships,
identifying patterns,
comparing); Interpreting
(drawing conclusions);
Applying (developing
and implementing action
plans)

Vocabulary:
water source, ground
water, surface water,
borehole, well, spring,
rain water catchment

Summary

Students map drinking water sources in their community, identify signs of healthy water sources and learn how to protect them.

Objectives

Students will:

- locate community drinking water sources.
- recognize healthy water sources.
- identify ways to protect community water sources.
- connect their water source with their personal drinking water.

Materials

- Large sheets of paper
- Colored pencils or other writing implements
- One copy of **Signs of a Healthy Water Source – Resource Page** (or write this information on the board for students to reference)
- Ball

Making Connections

Collecting water for drinking and household activities is part of many students' daily lives. This activity helps students to understand the source of their school, household and community drinking water, how to protect these sources and why.

Background

Water used in homes originally comes from one of three sources. These are:

- surface water (lakes, rivers, streams, reservoirs)
- ground water (boreholes, wells, springs)
- water-catchment or rain-water harvesting systems (roof-top collection systems)

Whether water is collected by hand or piped into a home from a municipal supply, these sources can provide safe drinking water if they are properly developed, maintained, used and protected. Surface water is most easily contaminated. Ground water usually is much cleaner, but can be contaminated by people or natural causes. Ground water can be tapped by a borehole or well, or it may flow naturally to the surface as a spring. Rain water captured from metal or tile roofs is relatively pure, especially if water from the first rain is used to flush the system before filling storage tanks.

The table, *Signs of a Healthy Water Source*, describes threats to each water source and explains some of the signs that the source is healthy.

Procedure

Warm Up

Ask students to make a circle. Tell them you are going to toss a ball and, as each student catches it, he or she names one feature of surface water. Ask one student to record responses on the board. Students should answer: lake, river, pond, reservoir, stream, puddle, ocean. Be sure to distinguish between fresh water sources for drinking water and salt water, which requires special treatment before drinking it.

Remind them water is also found under the ground and is called ground water. Toss the ball again and ask how ground water can be tapped. They may answer "well" or "borehole." Remind them that "springs" are places where ground water flows naturally to the surface of the earth.

Continue to toss the ball and ask if they can think of any other water sources. Tell them that rain can be harvested through water catchments.

The Activity

Part I

1. Take the class to the school's drinking water source (the location where students and teachers collect water for use at the school) and ask them to identify it: is it a well, borehole or stream?
2. Ask students if they think the water is



healthy to drink. Why or why not?

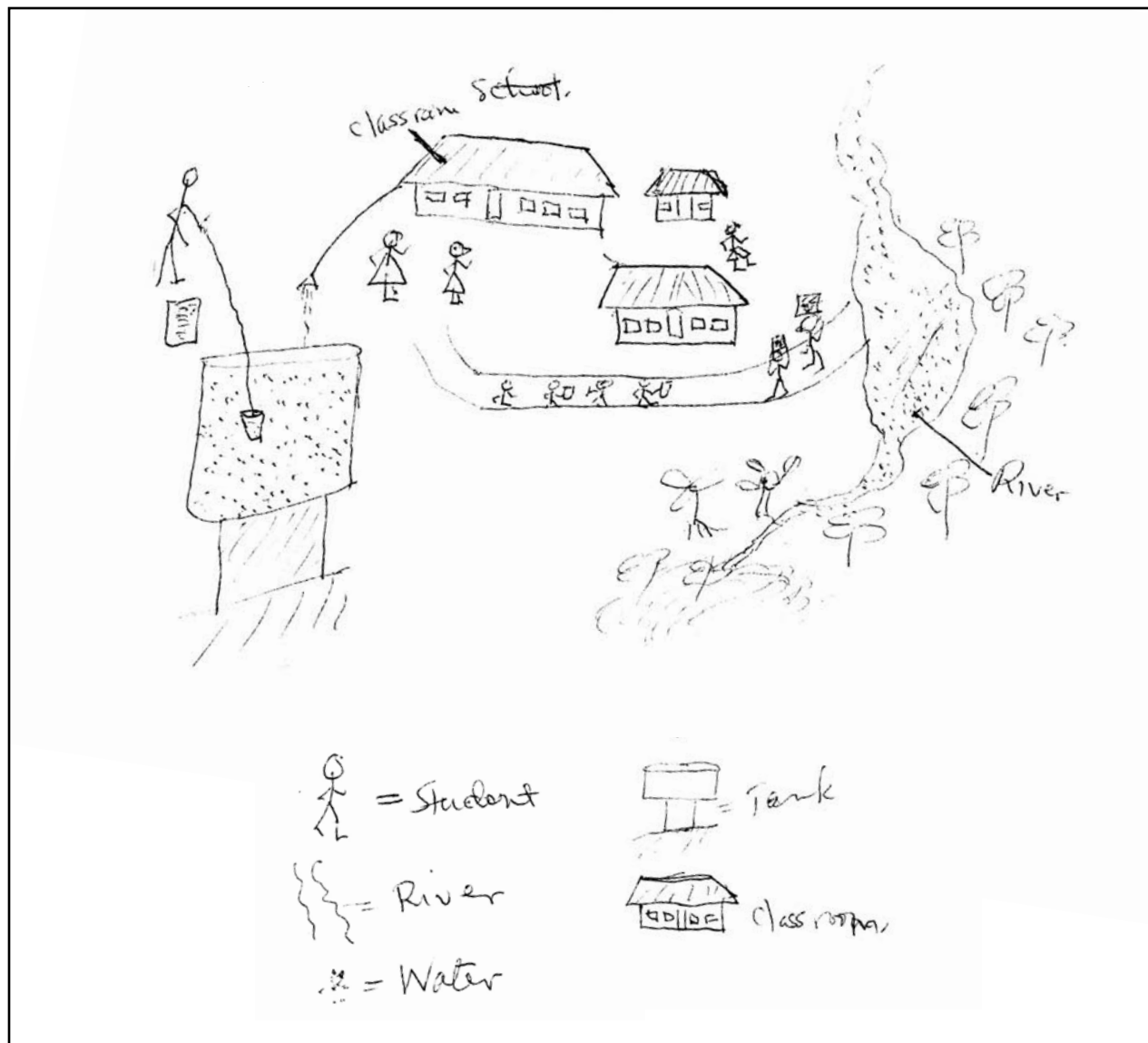
3. Ask how they would evaluate if the water is clean and safe?

4. Record student ideas. They may respond:

- the area around the source is clean.
- the water looks clear and has no odor.
- no one is washing their clothes or vehicle in the source, and no cattle or goats are grazing nearby.
- there has been no pattern of illness

among students who drink the water.

5. Divide students into small groups.
6. Provide each group with the appropriate checklist from the *Signs of a Healthy Water Source Resource Page*.
7. Add additional signs of a healthy source from the list the students made.
8. Ask each group to observe the water source and complete the checklist.



Community map example.

9. Based on their data, discuss with students the cleanliness of the school water source.

- What could they learn by monitoring the water source and surrounding area over a period of time?
- Beyond observation, is there anything that can provide additional information about the source? (Water quality

lab tests)

- If students are concerned about the quality of the school water source, discuss what they can do.

Part II

1. Ask the students to draw a map of the community where they live, including water sources such as pumps, wells, springs, etc., especially the water

source their family uses.

Encourage them to include on their maps:

- Animals if they are commonly tied up or found near water sources
- Latrine locations
- Bathing locations
- Standing water
- Water storage tanks

Also encourage students to use the symbols provided in the Legend

for labeling Community Maps to indicate different types of water sources. Give students about thirty minutes to complete their maps.

2. After maps have been drawn, ask students to evaluate a drinking water source on their map using the appropriate list for the type of water source in their community from the Signs of a Healthy Water Source Checklist – Resource Page (surface water, ground water or water harvesting). Is their water source healthy?
3. After maps have been completed, display their maps on the wall of the classroom.
4. Call on student volunteers to explain their maps and discuss the health of the water source they chose to evaluate.

Wrap Up

Discuss with students the quality of your school or community drinking water sources and if needed, ideas for

cleaning them. Your class may want to organize a clean-up day or speak with the school administration or community leaders about what they have learned and how the community could help improve the quality of these drinking water sources. If drinking water sources have been tested and are clean and safe, discuss how school and community members can maintain them. Remind students to ensure their water remains safe, it must be transported, stored and retrieved with care. Ask students who is responsible for clean drinking water. Remind them that we are all responsible!

Assessment

Have students:

- identify and evaluate the school drinking water source (**Part I**, steps 1-9).
- map and evaluate community drinking water sources. (**Part II**, steps 1-4).
- identify ideas for cleaning and maintaining drinking water sources (**Wrap Up**).

Extensions

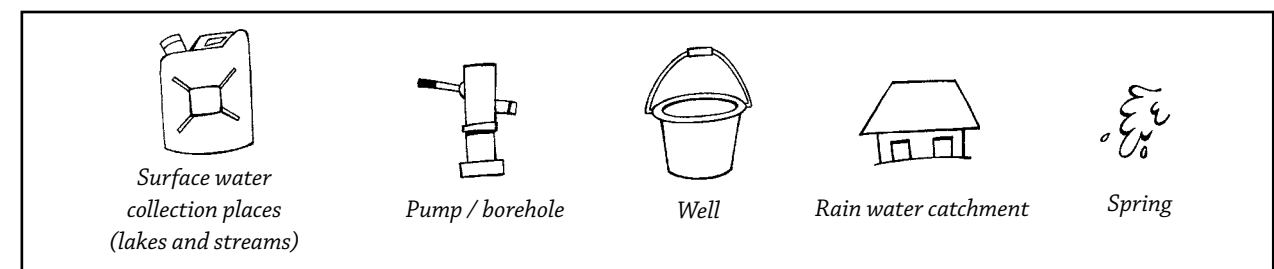
Have students organize a classroom event (Celebrating

Clean Drinking Water). Have them make posters and create short role plays to present to other classes. Have them share the message, “We are all responsible for clean drinking water!”

Resources

“Household Water Treatment.” WELL Technical Brief. <http://www.lboro.ac.uk/well/resources/technical-briefs/58-household-water-treatment-1.pdf>. (accessed April 2, 2008)

“Rain Water Storage.” Safe Water International. <http://www.safewaterintl.org/rain-storage.pdf> (accessed April 2, 2008)



Legend for labeling Community Maps

Signs of a Healthy Water Source—Resource Page

Surface water (lakes, streams, reservoirs, ponds, rivers)			
Signs of a healthy water source	Your Drinking Water Source		Explanation
	Yes	No	
Animals are kept away from the water.			Germs from human and animal waste easily contaminate surface water.
People do not defecate or urinate in or near the water.			
Latrines are clean and well maintained so they do not overflow.			
People do not bathe, wash cars, or do other clean-up in the water.			Detergents, grease and litter are challenging to clean from a surface-water source, and are more difficult to clean from drinking water than germs, which can be killed by boiling or other methods.
There is no litter floating in the water.			

Ground water (boreholes, wells, springs)			
Signs of a healthy water source	Your Drinking Water Source		Explanation
	Yes	No	
Latrines are located below the source, at least 30 meters away.			Germs from human waste can contaminate ground water if there is not enough soil to filter these contaminants between the latrine or septic tank and the water source. Overflowing latrines can release large amounts of waste and germs that are carried overland and can seep into ground water.
Latrines are clean and well maintained.			
Pipes or plumbing are clean and in good condition.			To ensure clean water coming from the ground is not contaminated.
The ground slopes away from the source so water does not collect around the source resulting in contaminated water running down into the borehole or spring.			Contaminants from surface water can enter ground water through a well head if surface water collects around the source.

Water-harvesting or catchment systems			
Signs of a healthy water source	Your Drinking Water Source		Explanation
	Yes	No	
Roofs and gutters are clear of debris.			Debris and dirt from the roof and gutters can contaminate a clean storage tank.
The first water to run off during a rain is used to flush the system before connecting the system to the storage tank.			
Pipes are well maintained.			Maintenance and frequent monitoring of a plumbed system reduce the possibility of outside contaminants.
Storage tanks are airtight.			Airtight lids on water storage tanks keep animals, insects and dirt from contaminating the water.

Water Wisdom

“If a child washes his hands, he could eat with kings.” Our ancestors speak to us through their proverbs and stories.

Subject Areas:

English (Language Arts), Science

Duration:

Warm up: 45 minutes
Activity: 60 minutes
Wrap up: 30 minutes

Setting:

Classroom or home

Skills:

Gathering (reading, listening, interviewing); Organizing (matching, arranging); Analyzing (identifying patterns, comparing, discussing); Interpreting (translating, relating); Presenting (writing, speaking)

Vocabulary:

comparison, literal, interpretation, proverb

Summary

Generations hand down wisdom through stories and proverbs. Students use them as a guide to create their own wise sayings about water.

Objectives

Students will:

- examine and interpret the meaning of traditional proverbs.
- describe two ways proverbs communicate meaning.
- create new proverbs to teach others about water and health.

Materials

- One card from the **Proverbs – Resource Page** for each group of three students

Making Connections

Students can often connect with elders who use proverbs to educate family and community members. In this activity, students examine the educational value of proverbs, and create their own to teach others about water and health.

Background

Passed from generation to generation, proverbs are short

sayings that reflect the values and beliefs of a culture. Across Africa, as in many other places around the world, proverbs are used to teach a lesson or a moral, warn against foolish acts, guide conduct, help solve problems and bring special meaning to situations.

Proverbs are used not only to instruct, but also to debate, tell stories and spice up daily conversation.

Proverbs have at least two and sometimes more meanings. One is the literal meaning. The other is a figurative interpretation, in which the real teaching or truth is contained. Consider the following Southern African proverb: “Not every-one who chased the zebra caught it, but he who caught it, chased it.” Literally interpreted, this is a statement about hunting. Figuratively and more broadly, it can mean that one must try to succeed, although trying is not a guarantee of success.

Formulating proverbs is an art form. In this activity, students are challenged to create their own. To get your students started, discuss stylistic devices or use the following sample proverbs.

- **Alliteration** – the repetition of a consonant sound in a phrase.
Many men, many minds
 - **Parallelism** – balance among clauses, phrases, or words.
Youths talk first then listen, elders listen first then talk.
He who laughs last, laughs best.
 - **Rhyme** – repetition of identical or similar sounds.
- A friend in need is a friend indeed.*
Advice when most needed is least heeded.
- **Ellipsis** – the omission of words.
A hedge between keeps friendship green.
Better late than never.
 - **Hyperbole** – exaggeration.
Do not use a hatchet to remove a fly from a friend’s forehead.
All is fair in love and war.
- **Paradox** – contradiction.
Darkness reigns at the foot of the lighthouse.
The longest way around is the shortest way home.
 - **Personification** – giving an object or idea human qualities.
A lie travels around the world while truth is putting her boots on.
A new broom sweeps clean, but the old brush knows all the corners.

Proverb Wisdom from Around the World

Proverb	One Interpretation
A village without elders is like a well without water.	A well without water is incomplete, as is a village without elders.
Until lions have their own historians, tales of the hunt will always glorify the hunter.	The story (or history) depends on the perspective of the person telling it.
Between true friends, even water drunk together is sweet enough.	Friendship makes everything seem brighter.
You think of water when the well is empty.	You don’t appreciate what you have until it is gone.
The youth walk faster than the elderly, but the elderly know the road.	Elders move more deliberately because their experience gives them better understanding than the young person has.
Health is the body of prosperity.	If you don’t have your health, you don’t have anything.
Where you will sit when you are old shows where you stood in youth.	You set the course for your life when you are young.
If a child washes his hands, he could eat with kings.	A young person who develops discipline and manners may participate with elders.
Not everyone who chased the zebra caught it, but he who caught it, chased it.	Trying does not guarantee success, but you cannot be successful unless you try.
A hippopotamus can be made invisible in dark water.	Ignorance can hide even a big truth.
We are who we are today because of those who came before us.	Our history and ancestors are important in shaping our identities.
Who digs the well should not be refused water.	Those who work should share in the benefits.

Procedure

Warm Up

Divide the class into groups of three students. Give each group one card from the *Proverbs – Resource Page*.

Each card contains three proverbs and one interpretation of each proverb. Have groups match each proverb with its correct meaning by drawing a line between each matched pair.

Assign each group one proverb from its card and have them read the interpretation to the class. Ask students to provide both the literal and figurative meanings. If the class is small or you have more time, you may have each student come up with their own interpretation for each proverb.

Ask students to describe the character and function of proverbs. Who uses proverbs? Why? Write their ideas on the board, and encourage discussion about the following characteristics:

Proverbs express basic truths or teachings.

Many proverbs advise against foolish behavior, or serve as a guide to acceptable behavior.

The real meaning of many proverbs is different from their literal interpretation.

Some proverbs are direct statements that can be interpreted literally, though often

expressed in poetic language.

Proverbs are short and, therefore, easy to remember.

Proverbs are passed down from generation to generation.

Some proverbs are culturally specific, while others can be broadly applied across cultures.

The Activity

1. **Tell students they will be creating their own proverbs about water, cleanliness, good sanitation practices and health.** Step one is to decide what they want their proverbs to teach.
2. **Ask the class to develop a list of ideas or teachings about clean water, links between clean water and health, guidance about sanitation, instructions for personal hygiene and other ideas related to water, cleanliness and health.** List them on the board.
3. **Divide students again into groups.** Have each group write at least one proverb about water, cleanliness, or health. Groups may use ideas from the board, or develop their own ideas for a proverb.

If students need help getting started use the following suggestions and examples:
- Using an existing proverb as a model can be a good way to start. For example, students can change the proverb, “*He who forgives ends the argument,*” to say, “*She who drinks clean water lives a long and healthy life.*”
- Rhyming can make proverbs memorable. “*Where flies’ legs land, germs are close at hand*” is a proverb using rhyme.
- Students might know other proverbs that express relevant ideas and can be models for new proverbs. For example, a proverb from the United States is: “*An ounce of prevention is worth a pound of cure.*” Students can modify that to say, “*Drinking a cup of boiled water now is better than taking a pound of medicine later.*”
4. **When groups have completed their work, bring the class back together.**
5. **Have groups present their proverbs to the class.** After each proverb is stated, ask the class to interpret it.
6. **After hearing ideas from the class, have the presenter explain the group’s intended meaning.**

Wrap Up

Write the following Yoruba (Nigeria) proverb on the board: “A proverb is the horse that can carry one swiftly to the discovery of ideas.”

Discuss which of the new water proverbs best carry them “swiftly to the discovery of ideas.”

Assessment

Have students:

- identify how proverbs communicate meaning (**Warm Up**).
- list five characteristics of

- proverbs (**Warm Up**).
- create, present, and explain an original proverb about water or health (steps 3 through 6).

Extensions

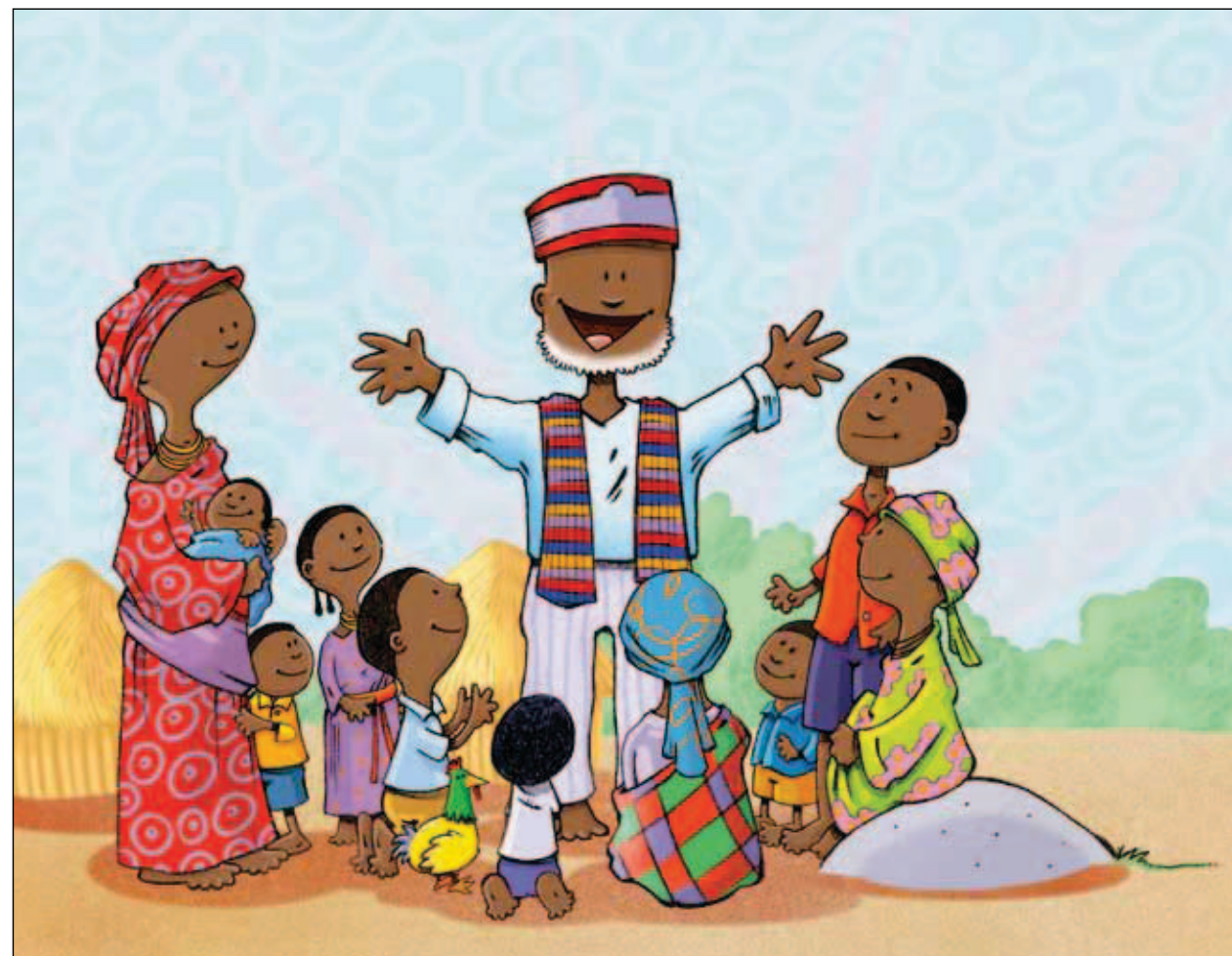
Make educational posters using illustrations and traditional or new proverbs about water, cleanliness and health. Or create educational songs using student proverbs as lyrics. Use these tools to teach youngsters, other classes, or community members.

Play Proverb Charades. Have a student or group use role play to act out a proverb, and the rest of the class guess the proverb. Actors may choose to portray either the literal or figurative meaning.

Resources

African Proverbs, Sayings, and Stories. <http://www.afriprov.org/> (accessed April 2, 2008).

“Famous Proverbs and Adages.” Brain Candy. <http://www.corsinet.com/brain-candy/proverb.html> (accessed April 2, 2008).



Proverbs—Resource Page

Card #1

1	A village without elders is like a well without water.	A	Friendship makes everything seem brighter.
2	Until lions have their own historians, tales of the hunt will always glorify the hunter.	B	A well without water is incomplete, as is a village without elders.
3	Between true friends, even water drunk together is sweet enough.	C	The story (or history) depends on the perspective of the person telling it.

Card #2

1	You think of water when the well is empty.	A	Elders move more deliberately because their experience gives them better understanding than the young person has.
2	The youth walk faster than the elderly, but the elderly know the road.	B	If you don't have your health, you don't have anything.
3	Health is the body of prosperity.	C	You don't appreciate what you have until it is gone.

Card #3

1	Where you will sit when you are old shows where you stood in youth.	A	You set the course for your life when you are young.
2	If a child washes his hands, he could eat with kings.	B	Trying does not guarantee success, but you cannot be successful unless you try.
3	Not everyone who chased the zebra caught it, but he who caught it, chased it.	C	A young person who develops discipline and manners may participate with elders.

Card #4

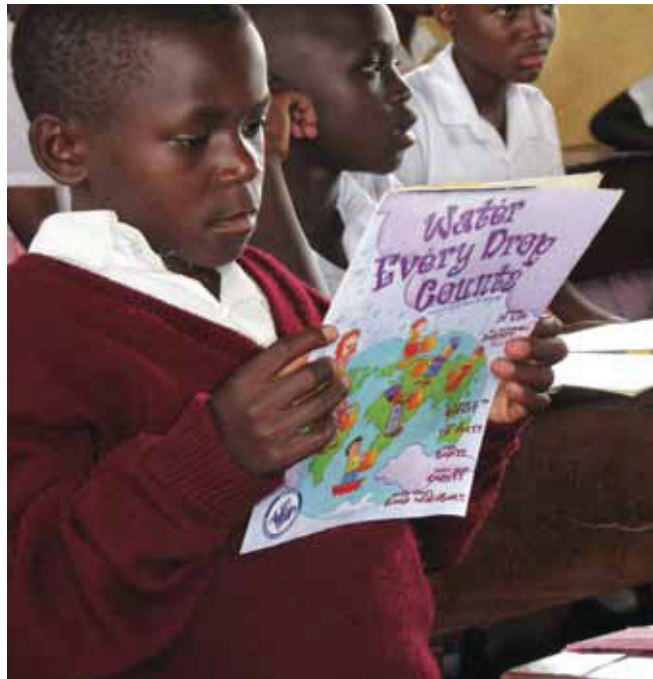
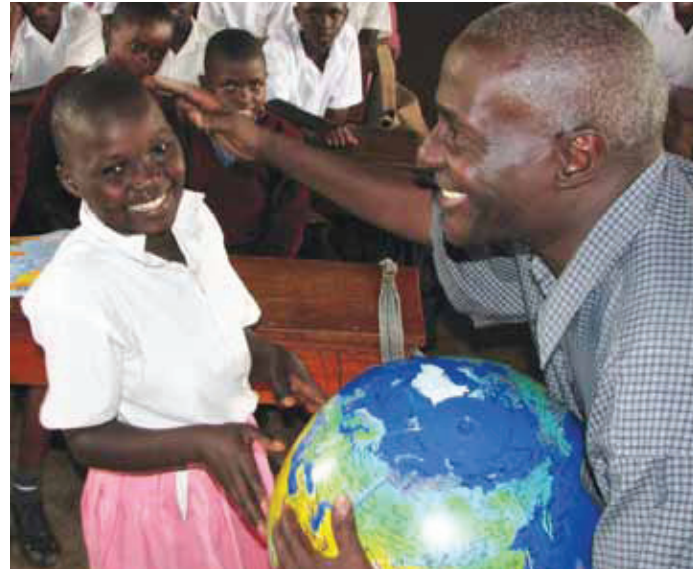
1	A hippopotamus can be made invisible in dark water.	A	Those who work should share in the benefits.
2	We are who we are today because of those who came before us.	B	Our history and ancestors are important in shaping our identities.
3	Who digs the well should not be refused water.	C	Ignorance can hide even a big truth.

Answers: Card #1 – 1B, 2C, 3A; Card #2 – 1C, 2A, 3B; Card #3 – 1A, 2C, 3B; Card #4 – 1C, 2B, 3A

A Call to Action

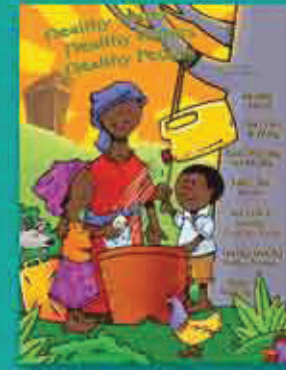
The need for water resources education training and materials in Africa is great. To help expand Project WET's work and the impact of water education in Africa, sponsors (NGOs, agencies, corporations, individuals) can:

- Support a wider distribution of *Healthy Water, Healthy Habits, Healthy People* and help make this publication available to more people.
- Sponsor a Project WET workshop for schools, communities or countries.
- Donate Project WET materials to a classroom, school or community.

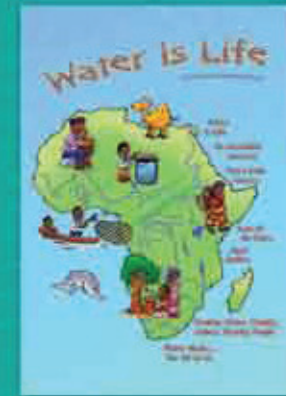


- Sponsor school and community events to educate participants about water using Project WET.
- Provide grants for community improvement projects linked to Project WET education materials.
- Fund the development of Project WET activities and materials on new, relevant topics.
- Sponsor a teacher in an African school providing her access to additional Project WET resources.

Companion Publications



Healthy Water, Healthy Habits, Healthy People Student Activity Booklet – Companion to the Educators Guide of the same title



Water is Life Student Activity Booklet – Basic water principles specific to Africa



The Water Cycle Poster – An interactive poster illustrating the water cycle

Project Management Team:

John Etgen, Project Director
Molly Ward, Project Manager
Morgan Perlon, Project Assistant
Sandra DeYonge, Vice President of Publications
Kristen Read, Project Manager
Publications Manager
Meg Long, Chief Financial Officer

Thanks to the Project WET Foundation staff for all your support and for making this publication possible:

Dennis L. Nelson, President and CEO
John Etgen, Senior Vice President
Sandra DeYonge, Vice President of Publications
Meg Long, Chief Financial Officer
Linda Hveem, Executive Assistant to the President and CEO
Lindsay Lemon, Bookkeeper

Laurina Lyle, Executive Director and National Network Coordinator, Project WET USA
Julia Nelson, Project Manager
Heath Noel, IT Coordinator
Morgan Perlon, International Projects Assistant
Kristen Read, Project Manager & Publications Manager
Nicole Rosenleaf Ritter, Communications Specialist
Verna Schaff, Accountant
Theresa Schrum, Project WET USA Assistant

Erin Vait, Sales Manager
Abby Ward, Project Assistant
Molly Ward, Project Manager

Thank you to USAID and SAIC.

Illustrations by Peter Grosshauser
Original Design by Geoff Wyatt, Wyatt Design
Reprint Design by Abby McMillen, Folk Dog Art
Production coordination by Koehler + Co. Assistant

Thank you to the participants of the Writing Workshop whose ideas became these activities, the wonderful people of Africa and all who contributed to the evolution and development of this Educators Guide.

For other publications, go to www.projectwet.org.

