10.0 (MIDDLE SCHOOL) "WALKING FOR WATER" MINI-UNIT

National Curriculum Alignment:
(The following National Curriculum Standards are addressed by completing all of the activities associated with the Walking for Water mini-unit. See http://www.educationworld.com/standards/national for a corresponding key to standards.)

English Grades 6-12

NL-ENG.K-12.1
Reading for Perspective: Students read a wide range of print and non-print documents to build an understanding of texts, of themselves, and of the cultures of the United States and the world.

NL-ENG.K-12.3
Evaluation Strategies: Students apply a wide range of strategies to comprehend, interpret, evaluate, and appreciate texts.

NL-ENG.K-12.4
Communication Skills: Students adjust their use of spoken, written, and visual language to communicate effectively with a variety of audiences and for different purposes.

NL-ENG.K-12.5
Communication Strategies: Students employ a wide range of strategies as they write and use different writing process elements appropriately to communicate with different audiences for a variety of purposes.

Science Grades 6 - 12

NS.9-12.3
Life Science: Populations and ecosystems/ Diversity and adaptations of organisms/ Interdependence of organisms

NS.9-12.6
Science in Personal and Social Perspectives: Personal health/Populations, resources, and environments/Risks and benefits

Social Sciences Grades 6-12

Geography Grades K - 12

NSS-G.K-12.2
Places and Regions: Understand the physical and human characteristics of places/ Understand that people create regions to interpret Earth's complexity/ Understand how culture and experience influence people's perceptions of places and regions.

NSS-G.K-12.3
Physical Systems: Understand the physical processes that shape the patterns of Earth's surface/ Understand the characteristics and spatial distribution of ecosystems on Earth's surface.

NSS-G.K-12.4
Human Systems: Understand the characteristics, distribution, and migration of human populations on Earth's surface/ Understand the characteristics, distribution, and complexity of Earth's cultural mosaics/ Understand the patterns and networks of economic interdependence on Earth's surface/ Understand the processes, patterns, and functions of human settlement/ Understand how the forces of cooperation and conflict among people influence the division and control of Earth's surface.

NSS-G.K-12.5
Environment and Society: Understand how human actions modify the physical environment/ Understand how physical systems affect human systems/ Understand the changes that occur in the meaning, use, distribution, and importance of resources.

:: **Middle School:**
:: **"Walking for Water"**
:: **Level of difficulty and duration:** 💧💧

Pre-activities:
Distribute materials on "Women Bear the Weight of Water" and/or Kenya, Honduras and Ethiopia materials. Students will answer "Women Bear the Weight of Water" Reading for Comprehension Questions. Students will discuss facts relating to the difficulty and sociological implications of the unavailability of water in each of the above regions. Review statistical information regarding average distances travelled for water. Form a hypothesis about the difficulty level of performing the task of carrying a gallon of water ½ mile.
Objective: Students will compare their own experiences with the availability of water to those in third world countries.

Lesson:
Students will be asked to fill gallon containers with water and walk the distance of ½- mile.
Materials: Students will bring in clean, empty plastic gallon jugs from home. The instructor will pre-determine a route of ½ mile around the school campus and should inform the administration about the activity in advance.

Post Activities:
Students will discuss their experiences as a group. Are students better able to empathize with third world conditions after the activity? Why or why not? Were student's earlier predictions about difficulty level accurate? Review statistics regarding gallons needed and miles carried by people living in Africa and South America as documented in "Bearing the Weight of Water" and/or Kenya, Honduras and Ethiopia materials.
Optional Post-Activities: Have students try to lift a two or three gallons of water at a time. (Be careful, because water weighs a lot!) Explain to students that many people in other parts of the world do not have access to running tap water or to wells. People (most often women) in other parts of the world carry as much as twelve gallons of water on their heads very long distances to meet the needs of their families.

Water Portfolio Entry:
Women in many areas of the world must carry large amounts of water long distances to provide the basic needs of their families. What other tasks might these women be doing if they did not have to spend so many hours (sometimes as much as 20 hours per week) carrying water? What could you do with 20 extra hours per week?

WATER-AWARE FACT SHEET

In many regions of the world, fresh water, both groundwater and surface water, **is being used faster than it can be replaced.** Already about one-third of the world's population lives in countries suffering from moderate-to-high water stress, according to the most recent Global Environment Outlook (GEO-3) report. Water stress is defined as areas where water consumption is more than 10% of renewable freshwater resources. The GEO-3 scientists project that **more than half the people in the world could be living in severely water-stressed areas by 2032.**

A lack of safe drinking water brings an added burden of illness to families already living in poverty. Infectious **waterborne diseases such as diarrhea, typhoid, and cholera are responsible for 80% of illnesses and deaths in the developing world,** many of them children. Worldwide, approximately 15 million children a year die from a waterborne disease or related illness.

The amount of water a person needs can vary; obviously, a person doing manual labor in the tropics will need more water than someone sitting at a computer in a temperate zone. **The World Health Organization (WHO) suggests 0.5 to 1 gallon a day for drinking, and another 1 gallon for cooking and food preparation as the bare minimum for survival.** However, the minimum quantity of water recommended by **the U.S. Agency for International Development for household and urban use is close to 26.4 gallons per person per day.**

Some two million tons of waste per day are disposed of in open freshwater sources, including industrial wastes, agricultural wastes, human waste and chemicals. World Watch Institute, for example, estimates that **every minute, 300,000 gallons of raw sewage are dumped into the Ganges River, the primary source of water for many Indians.**

In all of Asia, only about 35 percent of the wastewater is treated, and about 14 percent is treated in Latin America. **A minimal percentage of treatment has been reported to be treated in Africa.** Even in industrialized countries, sewage is not universally treated, according to UNEP (United Nations Environment Program).

Freshwater resources are being further squandered due to pollution and the way in which we use water. **Agriculture accounts for an unbelievable 80% of world water consumption**, and an **estimated 60% of the water used for irrigation is wasted**, lost to leaky canals, evaporation, and mismanagement. Fertilizer and pesticide residues from farming also contribute to contamination of fresh water resources. Large cities waste their share of water too due to leaky systems.

Conserving and managing freshwater resources is politically and socially difficult; many rivers, lakes, and underground aquifers cross national boundaries and are often be shared by several countries, all with differing laws and beliefs about rights to use and ownership.

"This crisis is one of water governance, essentially caused by the ways in which we mismanage water," conclude the authors of the UN's World Water Development Report issued in March of 2007. According to Brian Morris, principal hydro-geologist at the British Geological Survey, "What is needed is pragmatic management such as **increasing public and government awareness**, properly resourcing the agencies that manage groundwater, supporting community management, and encouraging the use of incentives and disincentives particularly in poorer countries and rural areas. **It is vital we give groundwater value like any other scarce resource".**

Source: UN Highlights World Water Crisis (2007): (http://news.nationalgeographic.com)

"Water-Aware Fact Sheet"
Reading for Comprehension Questions

1:: According to the most recent Global Environment Outlook report what percent of the world's population lives in countries suffering from moderate-to-high water stress?

2:: Which three infectious waterborne diseases are responsible for 80% of illnesses and deaths in the developing world?

a)
b)
c)

3:: Worldwide, approximately how many tons of waste is deposited into freshwater sources each day?

4:: What four factors help explain the extensive loss of water in many agricultural practices?

a)
b)
c)
d)

5:: Which two types of agricultural run-off residues contribute to the contamination of fresh-water resources?

a)
b)

6:: What factors make conserving and managing freshwater resources difficult?

7:: Develop three recommendations or strategies for private citizens and/or government agencies to better protect freshwater as a scarce resource:

a)
b)
c)

WATER-AWARE FACT WORD SEARCH

T A I A H I R R I G A T I O N
D A I L R A A W A R E N E S S
A W S T H T Y P H O I D P R A
O P V O C I O I H U F R G P E
A L D I I C I S G N S E C L G
A S I A T A C E P D C O O K I
H S S K R F R Y O W A V N G D
T A E T C R T I L A I N S S A
T A A G R I C U L T U R E U C
T A S R I C H I U E H C R T T
R D E I S A O B T R O U V A H
W U W A I C L O I V E N E O E
O K A A S O E P O V E R T Y O
Y L G R W D R I N K I S H R T
E W E R C B A T H E A I R O N

Africa
bathe
crisis
irrigation
typhoid

agriculture
cholera
disease
pollution

Asia
conserve
drink
poverty

awareness
cook
groundwaater
sewage

Water-Aware Fact Word Search

Africa
bathe
crisis
irrigation
typhoid

agriculture
cholera
disease
pollution

Asia
conserve
drink
poverty

awareness
cook
groundwaater
sewage

WOMEN BEAR THE WEIGHT OF WATER

In the developed world, humans do not have to carry the water we use on a daily basis. If we did, it's safe to assume we'd use a lot less than we do. The **average American individual uses 100 to 176 gallons of water at home each day.** The weight of that water is about 836 to 1400 pounds. Imagine if your family had to work together every day to transport over 800 pounds of water into your home!
For people living in many third world countries, distance from a clean water source is a critical factor. In particular, it affects the lives of women. Collecting water in third world countries is rarely a family activity. It is a task largely designated to women and young girls. **Because women are also responsible for the care of young infants and children, girls begin carrying a small version of a water jug as early as 2 years old.**

In some places in sub-Saharan Africa, for instance, **women can spend between 15 and 17 hours each week collecting water.** In times of drought, it can sometimes take even longer. Adequate water supply and good health are tightly linked, and the need to carry water long distances limits the amount women can bring to their families.

The dangers are not over even once water has been brought back home to the family. **Water is often contaminated with microorganisms that cause diarrhea, typhoid, and cholera.** These diseases are responsible for **approximately 80 percent of all illnesses and deaths in the developing world,** many of them children. In fact, **one child dies every eight seconds from a waterborne disease; approximately 15 million children a year.**

Women and female children who have to travel to collect water pay a high cost. **Less time is available for caring for children, preparing food, or pursuing income-generating activities.** In some regions women and girls must travel through unsafe areas and are vulnerable to attack. Families, in many cases, must forego sending their daughters to school, perpetuating the vicious cycle of illiteracy and poverty.

Sources: (http://www.amnh.org/exhibitions/water)
(http://news.nationalgeographic.com)

"Women Bear the Weight of Water"
Reading for Comprehension Questions

1::|Why do people in developed countries not have to worry about collecting their own water for daily use?

2:: Approximately how much water does the average North American family use per day?

3:: What is the most likely explanation for why women and girls in third world settings are disproportionately burdened with the task of finding and collecting water for their families?

4:: In what ways are adequate water supply and good health likely to be linked?

5:: What are the "costs" associated with women and girls collecting water as a daily ritual.

Possible answers:

1:: Infrastructures such as water treatment systems, pipelines and taps have been put into place to create safe and accessible water.

2:: Between 100 to 176 gallons of water

3:: Answers will vary. (Men may have other jobs to support the family. It is a tradition…[it has always been done that way]. Women and girls are the only family members available to do the work, etc.)

4:: Humans need safe drinking water to survive. Many diseases are linked to polluted and otherwise contaminated water sources.

5:: Less time is available for other activities necessary for survival or generating additional income. The personal safety of the women and children who travel may be at risk. Girls are not available to attend school, perpetuating a cycle of illiteracy and poverty.

ABOUT WATER.ORG

Water.org is a non-profit organization whose founders have transformed hundreds of communities in Africa, South Asia and Latin America by providing access to safe water and sanitation. Founded by Matt Damon and Gary White, Water.org works with local partners to deliver innovative solutions for long-term success. Its microfinance-based WaterCredit Initiative is pioneering sustainable giving in the sector. Water.org's life-saving work is made possible by the support of its donors, including the Open Square Foundation, the Pepsico Foundation, OnexOne and the Michael & Susan Dell Foundation. To learn more visit www.water.org.

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