

Water Education

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Region: West **Circle which primary base program it addresses -** 4-H

Section 1. Relevance

Relevance is included to provide the reason the educational program should be developed to address the identified issue. Within the relevance section, there are several questions that must be addressed. This section will seek to address these.

Where did this issue surface?

Texas Community Futures Forum

County Committees

Commodity / Industry / Special Interest Groups

Specialist(s)

What is the issue/problem?

Water consumption, water quality, aquifer restoration, non-point inputs, exceeding limiting factors, management impacts on water, land use and water

Problem size and scope? (How many people does it affect? How wide spread?)

highly variable in specific issues, but area wide in scope and impact, ground water and aquifer issues throughout

Problem severity? (How serious is this issue?) *HIGH*

All areas impacted from maintenance of in-stream flows and aquifer replenishment to surface water

Target Audience? (Who does the problem impact and how many?)

youth and adult leaders - everyone!

What are some general characteristics of the audience this program targets? How will you market this program to others?

Water issues are pervasive and poorly understood. We propose to address the issues through young people (primarily 9-13) with existing materials, e.g. Sportfishing - aquatic ecology, investigation water, water camps and related programs.

Section 2. Response

Response refers to how Extension intends to address the issue by developing an educational program.

State the goal of the program.

To reduce per capita consumption, increase water supply and quality

To increase knowledge and skills along with awareness and commitment to water conservation in youth

State the outcome objectives. These are the objectives that describe the intended results of a program (e.g. attitudes, knowledge, skills, adoption of practice/technology, change of behavior).

Client Change	At the end of this program, will....
<i>Knowledge</i>	increase knowledge on.... what water is, the water cycle and where we get it basic water quality and pollution aquifers, recharge and aquifer recharge and watershed water use by humans
<i>Skills</i>	develop skills.... conservation practices defining watersheds, aquifers, and water conservation practices apply the knowledge they have gained
<i>Attitude</i>	change their attitudes pertaining to... personally applying conservation practices becoming involved in conservation personally becoming aware and conservation - minded voters
<i>Behavior Change</i>	adopt.... conservation practices personal advocacy for water conservation avoidance of practices detrimental to water quality (pollution, etc)

<i>New Technology</i>	adopt... rainwater capture landscaping for water conservation observation of mini-watershed conservation tools like low-flow plots, showerheads, aerators, lawn water measurement
<i>Best Practice</i>	adopt gauging agricultural application re. Crop type, tillage options, etc. Effective conservation techniques in the home and landscape (xeriscaping, etc)

Program Design.

Topic (Subject Matter)	Strategy to Deliver Content (Method)	Existing Resource(s)	Contact Person(s) (Includes CEA's Specialists, Commodity Reps)
Hands - on Science and Mathematics	Schools as a follow up on investigating water water and water conservation methods and analysis	Investigating water	Ron Howard, Marilyn Hale, Richard Parrish, Billy Kniffen, Pascual Hernandez, Mike Mecke, Robert Scott
Rainwater Capture	School programs demonstration sites 4-H and other youth groups water camp	Texas Water Development Texas Parks & Wildlife "Water guzzlers" "Wildscapes"	Billy Kniffen Reuben Cantu (TPWD - San Angelo)
Landscape Demo Gardens and watering	Master Gardeners Master Naturalists Leader Camp	JMG Program Bobushite Brigades abooe plus National Wildlife Fed	Regional Hort. Specialists Hort. Agents

Watersheds	Paired Watershed Plots - Rain Simulators Enviroscape Classroom plots Investigating Water Sportfishing curr.	Investigating water Sportfishing "Enviroscape"	NRC8 Range Specialists River authorities Water Districts Range Ecology - Barron Rector also, TT, SASU, SFASU
Indoor Water - Quality and Conservation	Water testing water conservation kits gray water use promotion water camp	give water a hand investigating water national and state CES materials Lots of others	Mike Mecke
Surface Water and Aquifers	schools or clubs using local information field trips films tours water camp	Investigating water aquifer models aquifer films Edwards Aquifer films Computer models of Aquifers	Bruce Lesiker Texas State Univ. Tarleton State Univ.

Other Groundwater Resources Located on the Website:

1. U.S. Geological Survey <http://water.usgs.gov/>
2. Kansas State Research and Extension Mobile Irrigation Lab <http://www.oznet.ksu.edu/mil/>
3. The Groundwater Foundation <http://www.groundwater.org/>
4. North Plains Groundwater District <http://www.npwd.org/Ogallala.htm>
5. Red River Authority of Texas <http://www.rra.dst.tx.us/>
6. High Plains Underground Water Conservation District No. 1 <http://www.hpwd.com/ogallala/ogallala.asp>
7. Texas Section American Water Works Association <http://www.tawwa.org/>
8. Irrigation Technology Center, a center of the Texas Water Resources Institute, Texas A&M University <http://itc.tamu.edu>
9. Groundwater <http://enterprise.cc.uakron.edu/geology/natscigeo/Lectures/gwater.htm>

Section 3. Results

The last section deals with evaluation of this program. The evaluation content should mirror the objectives that are outlined in section two. Please try and list some specific questions that should be asked to the target audience to determine if the intended change took place. List as many potential questions as possible. The goal here is to create a question bank for each client change level so that the educator can review these questions to see if any of them are relevant to their program. If they are, then they can use them to measure change in their program. Remember, not all evaluation strategies have to be written questionnaires. They may also be interviews, direct observation, or focus groups. Please describe your method in this section where appropriate.

Client Change Level	Sample Questions (Review the objectives section to help place questions or statements in the space below)
<i>Knowledge</i>	<p>Basic How important is a sustainable water supply? Is transferring water from other parts of the state/country sustainable and wise? How are surface waters and sub-surface waters related How is water used in your home, community, state? Basic assessment of water facts</p> <p>Moderate Are some irrigation practices more efficient than others? How is water important to our health? How can I save water in my daily life?</p> <p>Advanced What are the benefits of good water magnet? Where to go for resources in this area?</p>
<i>Skills</i>	<p>conservation indoors and outdoors waste water mgmt water quality testing measuring H2O used on landscapes impacts of water in sediment loads in waters assessing health of riparian systems</p>
<i>Attitude</i>	<p>I care about water Not taking water for granted Understanding the importance of water Assessing impacts of human choices (e.g. st. Augustine grass) on water use Understanding that water quantity and quality unrecognized issues</p>
<i>Behavior Change</i>	<p>Observe per capita water use changes Application of conservation practices Avoiding polluting acts on the soil or watersheds</p>

<i>New Technology</i>	Efficient irrigation Application of in-house conservation devices and practices
<i>Best Practice</i>	

Water Conservation Example #1

PLEASE CHECK THE ANSWER that goes with how you feel about the statements below:

- | Yes | No | |
|-------|-------|---|
| _____ | _____ | 1. Conserving water is using as little water as possible. |
| _____ | _____ | 2. Xeriscaping is using plants in the landscape that require less water to survive. |
| _____ | _____ | 3. All the water in the world is mainly useable water we can drink. |
| _____ | _____ | 4. Three-fourths of the earth's surface is water. |
| _____ | _____ | 5. Can you get water out of the ground? |

Circle the BEST ANSWER:

Water conservation should be practiced by:

- A. homeowners B. farmers C. industry D. everyone

Over 50% of the water used inside the home is for:

- A. bathing and flushing B. drinking and cooking C. washing clothes and dishes

The worse time of day to water the landscape is:

- A. late afternoon B. early morning C. middle of the day D. late evening

The water that we can drink makes up what percentage of all the water in the world:

- A. 3 percent B. 25 percent C. 50 percent D. none of the above

Precipitation is:

- A. ponds B. rain C. running water

An aquifer is:

- A. a beach B. water tower C. a water bearing area in the soil

Please CHECK THE BOX for the statement that BEST DESCRIBES how you feel about water conservation.

Statements	Strongly Disagree	Disagree	No Opinion	Agree	Strongly Agree
Everyone needs to do their part in conserving water.					
Conserving water now will help to make sure we have enough water for all our needs in the future.					
I am going home to tell my parents about the importance of conserving water.					

Water Conservation Example #2

ACTIONS	Hardly Ever	Occasionally	Sometimes	Frequently	Almost Always
I make an effort to conserve water by changing my daily habits.					
I work with my house hold to find ways to conserve water.					
I repair water leaks in and around the home.					
I look for water saving equipment when shopping for household appliances.					
I try and reuse the water I have already used.					
I investigate ways to recycle water that is used in the house.					
I plant drought tolerant plants.					
I use mulch in my land scape.					
I use water conservation irrigation (l. e. timers, soaker hose, drip irrigation).					
I make an effort to screen my water well(s).					

Economic Indicators. Are there economic indicators that can be measured concerning this issue?

YES

Some have a relatively long refractory period

Please list them below.

Water costs

Water consumption per capita in school/at home

water treatment cost

Interpretation. The last step in the process is interpreting the results to our stakeholders. List internal and external stakeholders that would be interested in the results of this educational program. Do not forget to think about other state agencies and groups that would be interested in these outcomes.

Internal to Extension Stakeholders	External Stakeholders
Ag engineering range water resource instruction wildlife and fisheries landscape and horticulture 4-H agents, leaders, youth	legislators local school boards water districts river authorities irrigation districts Many Nonprofits regulatory agencies industry Brewers & Distillers