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Weber Water Fair: A Partnership for Water Conservation Awareness for Fourth Grade Youth

Abstract
Weber Water Fair engages 4th grade youth through hands-on learning to explore water conservation and quality issues. Development and evaluation of a water education experience that meets the needs of state education standards is described. The Water Fair experience is easily adapted to meet the need for hands-on learning about water for public schools in a variety of geographic areas.

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Introduction

The Weber Water Fair is a 2-day event that teaches 4th grade students where water comes from and where it goes in a desert state. In 2003, Utah State University Extension 4-H partnered with other organizations to create the "Weber County Water Fair" experience for students in Weber and Ogden school districts. Specific program goals included the following.

- Raise awareness in youth about the importance of water conservation.
- Describe ways that youth can apply water conservation methods in their personal lives.
- Define a watershed, and have the youth identify which watershed they live in.
- Educate youth about sources and prevention methods of point and non-point source pollution.

Overview

Fourth grade students are able to spend one half of a school day discovering the importance of water quality and conservation. Skills and practices that kids can implement are taught, such as turn off the sink while brushing your teeth. Students experience some hands-on learning while looking at water bugs. It is hoped that these youth will reduce water consumption in their households, and change behaviors to prevent water pollution.

Teachers completed a 1-page evaluation at the end of the experience. Evaluation results revealed that the number one impact of the Water Fair was to review the water unit for fourth grade science core testing and that the second was hands-on learning. In addition to open ended questions to find out why they come and impacts of the event, teachers were asked to rate the experience elements using the following scale: 1 being very bad, 3 fair, and 5 excellent:

- Teacher Orientation Packet: 4.46
- Presenters: 4.47

- Water Fair Field Guide: 4.875

Need for the Water Fair Experience

Utah is the second driest state in the nation, with an average of 13 inches of precipitation annually. Unfortunately, Utah also has one of the highest water usage rates (Utah Department of Water Resources). In 2004, Utah was entering its sixth year of severe drought. Even with an extreme water shortage the people of Utah continued to waste water.

> Non-formal educational experiences, such as those found in 4-H, can play an important role in increasing children's exposure to, and interest in, science. Science-related projects are the most common among the myriad of projects available to youth through their 4-H programs and account for nearly one-half of all 4-H projects administered nationally (USDA, 2001). Science project topics include environmental education and earth sciences, plants and animals, and technology (USDA, 2001).

True Needs, True Partners

Utah State University Extension 4-H partnered with Weber County Storm Water Management and the Weber Soil and Water Conservation District to educate fourth grade students throughout Weber County about water conservation and quality, and watersheds. This grade was selected because the water cycle is a large component of the science standards for fourth grade students.

Each partner brought important resources and needs to the event. Extension had expertise to facilitate school enrichment programs but does not have the funds to assist with student transportation costs. The county Storm Water Management unit had a need to provide community education about non point source pollution prevention and funds to assist with the program. The Soil Conservation District (SCD) recognized that the county is becoming increasingly urban and saw the event as an opportunity to reach urban youth with their message.

4-H was responsible for managing the logistics of contacting the schools, facility arrangements, program development, and contacting/confirming presenters. Storm Water Management provided funds to pay for bussing all of the students to the event and printing costs for water conservation temporary tattoos and workbooks. The SCD paid for all of the presenter lunches for the 2-day event and purchased event t-shirts.

Without the assistance of the partners, it would have been difficult for 4-H to conduct the activity because of limited funds. In addition to these partners, presenters from various local, state, federal, and non-profit agencies were asked to discuss water topics.

Event Schedule and Activities

The 2-day Weber Water Fair was divided into four half-day sessions. Teachers in two school districts were invited to bring their classes to listen to mini-presentations related to water. To increase the access to the event, Weber County Storm Water Management paid to bus the students to the event.

As students arrived, they were issued a welcome bag that contained storm water activity books and temporary tattoos with a water-related message. Each student also received a "passport" to the event that asked him or her to check off the presenter stations as they traveled through the event. The passport also included word searches, puzzles, and hands-on experiments for youth to learn more about water. At the end of the event, a prize drawing was conducted with tickets attached on the back of the passport.

What Teachers Want

Teachers were asked to complete a one-page evaluation of the event. Evaluations were distributed to all teachers during the experience and collected as teachers exited the building to the buses. Approximately half of the evaluations were returned. In future Water Fair events we plan to bring pencils for the teachers; we found because they were on a field trip, many teachers did not bring a writing instrument to complete the evaluation.

Evaluation questions included why did they choose to attend the Water Fair, how did the students benefit, and how they planned to use the event in the classroom. Every teacher identified that his or her students benefited through participation in the event. The bulk of teachers (76%) used the event as a review for state science testing, with the other 24% utilizing to introduce their water unit.

The most popular presentation involved hands-on investigation of water bugs as an indicator of water quality. It was presented by Utah State University Extension's Water Quality unit. Teachers listed hands-on activities like the macro-invertebrate investigation as the second highest reason that the Water Fair experience created an impact on their students. The only thing teachers found more important was a review of their water unit. Teachers indicated that hands-on activities are difficult for them to do in the classroom. The equipment and expertise of presenters eliminated this

barrier and reinforced materials presented in the classroom.

This lack of hands-on learning, though alarming, can be understood. A recent examination of elementary school classrooms revealed that instructional practices in science might not be meeting students' educational needs. For example, classroom teachers in grades K-5 report spending an average of only 25 minutes per day in science activities, which is less than one-quarter of the time spent on reading and literacy (Fulp, 2002).

The lack of teachers' subject matter expertise and formal training undoubtedly contributes to the under-representation of science in elementary classrooms. Learning science is a cumulative process (Hinman, 1999) and requires an approach that stresses long-term process skills over one that emphasizes short-term, fact-based questions and answers, and specialized training is required to teach the subject effectively. However, only 4% of the teachers at the elementary school level have undergraduate degrees in science or science education, and most report low levels of participation in professional development opportunities related to science teaching (Fulp, 2002).

When planning the event, USU Extension 4-H reviewed the State of Utah's Core Curriculum for Science, specifically the water unit. Based on the core requirements, they invited presenters who would have a message that would be appropriate to the age and learning objectives of the youth. After the first year, some presenters were not invited back based on their presentation or lack on involvement with students. USU Extension 4-H also suggested to presenters in the presenter confirmation letter that they include hands-on or interactive components to their presentation. It is not enough to concentrate on a few key words in the core; the information needs to relate to at least one of the teaching objectives.

A simple question to ask when looking at how to meet core objectives through hands-on or interactive activities is, "What is too messy, too expensive, or requires too much expertise for a teacher to do in a classroom?" These are the type of activities that teachers are looking for to make the experience a positive one for their students. For example, many teachers don't have the expertise and equipment to collect macro-invertebrates from a local stream/river and bring them into the classroom. USU Extension Water Quality Unit was able assist teachers with hands-on experience and inform them about upcoming teacher workshops like Project Wet and Streamside Science for teachers who are seeking more information and skills.

Conclusion

The second annual Weber Water Fair in 2004 was attended by over 1,200 students and Utah's Governor, Olene Walker. Governor Walker's visit was part of the Governor's Watershed Initiative and the Adopt-A-Waterbody program. At the event, she signed the Take Pride in Utah Day Declaration, which officially began a month of watershed improvement and education efforts throughout Utah. The Weber Water Fair continues to grow. In 2005, over 1,300 youth and teachers participated in the Water Fair experience.

Water quality and conservation are serious concerns for the people of Utah. Youth are very pro-active and can form new habits that will help with the quality and conservation of water resources. The Weber Water Fair applies a "learn by doing" 4-H concept of hands-on interactive learning to teach water conservation and quality to 4th grade students in Weber and Ogden City School Districts. It reinforces the science core competencies using hands-on discovery to create experiences for youth to get involved in water issues.

The experience also demonstrated the importance of identifying where an Extension message fits into existing school standards and reinforces the standards teachers are required to teach. The Water Fair model can be easily duplicated in other areas by other Extension offices, agencies, and conservation groups interested in reaching youth with a stewardship message.

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