4H and Water: How to Empower Youth to Protect Water Resources

Water Conservation: half-empty or half-full?

Regional Webinar Series

Feb. 15, 2011
Randy Seagraves, Curriculum Coordinator, National Junior Master Gardener Program, and Texas AgriLife Extension Program Specialist, Texas A&M University
Curriculum Design

Hands-On and Project Based
Integrated across all subject areas
Flexibility of use
Choices available in group and individual activities
Community service and leadership incorporated in all units
Operation W.A.T.E.R.: Dr. Thistle Goes Underground

Soils and Water

JMG® Teacher/Leader Guide

Junior Master Gardener

growing good kids

Silent Observer
Operation W.A.T.E.R.

water and the earth’s resources

...Thistle Goes Underground
Operation W.A.T.E.R.

water and the earth’s resources

...Thistle Goes Underground

teaching concepts:
Operation W.A.T.E.R.

water and the earth’s resources

...Thistle Goes Underground

teaching concepts:

• Soil Color, Texture, & Structure
• Nutrients
• Soil Improvement
• Soil Conservation
• Water Cycle and You
• Water Movement
• Watersheds, Wetlands and Aquifers
• Water Conservation
Mission 6: Finding The Source

Agent 9:

Great job, Agent 9! Your work has revealed how the Black Scourge is spreading! Thistle is using the palace watersheds and aquifers to carry the ooze pods throughout the ecosystem.

Watersheds are large sections of land that naturally carry water to the major water sources in the area. Dr. Thistle dumps the pods throughout the watershed, and nature does the rest. The scoundrel! The aquifers, which hold large amounts of water underground, are also contaminated. We must find a way to reverse this imbalance and restore the purity of our water!

Hang on — word just came in that Thistle has gone underground! The Battle Slugs have breached the thickets, only to find it abandoned. Well, not exactly. We did discover someone quivering behind a large tree root — he turned out to be none other than Grubby, Thistle’s right-hand slug.

Oh! Great news! I’ve just been told that Grubby has revealed Thistle’s hiding place! A little encouragement and a handful of sueroot is all it took! Grubby says that Thistle has buried himself in the sand in an underground tunnel.

Thistle thinks he’ll wait there patiently until the Black Scourge has engulfed the area, and then he’ll resurface and claim the queen’s throne. We have moles tunneling in the area now. They’ll be able to pinpoint that smelly weed! Trust me — he won’t get away!

I need you to chart the area’s aquifers and watersheds and work with Agent Gingko to invent a way to clean up the waters of the palace. Hurry, Agent 9! Queen Flora’s vital signs are fading!
The mission of the JMG program is growing good kids by igniting a passion for learning, success, and service.

Operation WATER helps meet that aim while helping to increase the “Water IQ” of the sometimes hard-to-reach junior high school audiences & builds on research of the JMG Level One curricula that research boosts science achievement scores in youths.
Operation W.A.T.E.R.

Up, Down and Sideways Shout

Motivate students with music, movement and water

(p116, Water Wicking p112)
>>please select your current mission
Students see and *feel* how water moves over land.
Operation W.A.T.E.R.  
Water in your Hands

Students see and feel how water moves over land.

(p100)
Operation W.A.T.E.R.

Water in your Hands

Students see and *feel* how water moves over land
Operation W.A.T.E.R.

Water in your Hands

Students see and *feel* how water moves over land
what happens when you do a better job watering just the root zone?
what happens when you do a better job watering just the root zone?

Operation W.A.T.E.R.

Read the Roots

Thicker longer roots, help plant survive 2 week classroom drought
Operation W.A.T.E.R.

Carpeting Wetlands

experiment to learn the function of wetlands
Operation W.A.T.E.R.

Root Zone Water Police

Students protect water and serve their community by providing customized info about a lawn’s specific water needs.
1. Run the sprinklers for 15 minutes.

Students protect water and serve their community by providing customized info about a lawn’s specific water needs.
Operation W.A.T.E.R.

Root Zone Water Police

1. Run the sprinklers for 15 minutes.

2. Twenty-four hours later, dig up a shovelful of soil to measure the number of inches deep the soil is moistened.

Students protect water and serve their community by providing customized info about a lawn’s specific water needs.
Operation W.A.T.E.R.

Root Zone Water Police

1. Run the sprinklers for 15 minutes.

2. Twenty-four hours later, dig up a shovelful of soil to measure the number of inches deep the soil is moistened.

3. Divide 90 by the depth in inches of the moistened soil.

Students protect water and serve their community by providing customized info about a lawn’s specific water needs.
How does work?!

*Students determine a simple ratio:*
How does work?!

Students determine a simple ratio:

\[
X \text{ inches} \quad \frac{15 \text{ minutes}}{Y \text{ minutes}} = \frac{6 \text{ inches}}{} \quad \text{(ideal depth of moisture)}
\]

(tested depth of moisture) (number of minutes that area should be watered)

(number of minutes watered)
JMG Level Two
Operation W.A.T.E.R.
water and the earth’s resources

To earn certification in Soils & Water students must complete at least:

1 group activity per learning concept
1 individual activity per learning concept
1 community service project
1 life skill and career exploration activity
Checklist for earning certification as a Junior Master Gardener in Soils and Water

- Complete and mail in the registration packet (starting on page 183).

**Soil Color, Texture and Structure**
- The class completes one group activity.
- The teacher reads aloud the introduction to *Operation W.A.T.E.R.: Dr. Thistle Goes Underground* (page 13).
- The teacher reads aloud the Mission Brief (page 14) and gives each student a copy.
- The students each complete one individual Mission Options activity (page 15).

**Nutrients**
- The class completes one group activity.
- The teacher reads aloud the Mission Brief (page 32) and gives each student a copy.
- The students each complete one individual Mission Options activity (page 33).

**Soil Improvement**
- The class completes one group activity.
- The teacher reads aloud the Mission Brief (page 56) and gives each student a copy.
- The students each complete one individual Mission Options activity (page 57).

**Soil Conservation**
- The class completes one group activity.
- The teacher reads aloud the Mission Brief (page 76) and gives each student a copy.
- The students each complete one individual Mission Options activity (page 77).

**The Water Cycle and You**
- The class completes one group activity.
- The teacher reads aloud the Mission Brief (page 92) and gives each student a copy.
- The students each complete one individual Mission Options activity (page 93).

**Aquifers, Watersheds and Wetlands**
- The class completes one group activity.
- The teacher reads aloud the Mission Brief (page 108) and gives each student a copy.
- The students each complete one individual Mission Options activity (page 109).

**Water Movement**
- The class completes one group activity.
- The teacher reads aloud the Mission Brief (page 124) and gives each student a copy.
- The students each complete one individual Mission Options activity (page 125).

**Water Conservation**
- The class completes one group activity.
- The teacher reads aloud the Mission Brief (page 140) and gives each student a copy.
- The students each complete one individual Mission Options activity (page 141).
“I enjoy teaching the smaller kids what we have learned. It’s almost like being a big brother to them.”
Program Evaluation

National On-line Survey for Leaders Conducted by Texas A&M University Department of Agricultural Education and National JMG Program Office

- Over 85% of respondents stated that JMG has increased youth interest in science
- Over 83% of respondents stated JMG has contributed to higher academic standards
- Over 85% of respondents said JMG youths were more enthusiastic about learning
Studies specifically examining the benefits of students participating in JMG Curricula:

“...results show once weekly use of gardening activities and hands-on classroom activities help improve science achievement test scores.”

Impact of Hands-on Science through School Gardening in Louisiana Public Elementary Schools

- “Students in the experimental group scored significantly higher on the science achievement test compared to the students in the control group.”

Growing Minds: The Effect of a School Gardening Program on the Science Achievement of Elementary Students
Program implementation & Costs

- approx 70% groups lead by teachers

- can be supported by some county Extension office but curriculum designed in “cookbook” fashion so teacher training not required for implementation

- publication cost $35/$33, household activity materials

- registration/certification free