WATER EDUCATION PROGRAM
ANNUAL REPORT

23

Post Oak Savannah GCD
Water Education Program
Designed and implemented by Tinker LLC

WATER EDUCATION PROGRAM

MESSAGE FROM **TINKER LLC**

Joseph Thrasher

Dear Doug,

I'd like to express our sincere gratitude for selecting Tinker LLC once again to deliver your Water Education Program. It was truly a pleasure to work with the educators, students, and parents in Milam and Burleson counties. Your continued support is invaluable to us, and we are honored to have the opportunity to contribute to your educational initiatives.

Enclosed, please find the comprehensive report detailing the outcomes of the Water Education Program during the school year 2022–2023. We have dedicated significant efforts to ensure its success, and we hope the results meet your expectations.

We are committed to maintaining the high standards of our programs and are eager to continue our partnership with you in the coming years. If there are any specific areas you would like to discuss or if you require further information, please do not hesitate to reach out to us.

Warm regards,

Joseph Thrasher
President

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EXECUTIVE SUMMARY

School Year 2022–2023

EXECUTIVE SUMMARY

Tinker LLC is delighted to present its annual report outlining the progress and outcomes of the Water Conservation Education Program, which was executed in collaboration with the Post Oak Savannah Groundwater Conservation District (District) from August 2022 to June 2023.

The initiative was devised to impart knowledge about water conservation to both future rate payers (fourth-grade students) and current rate payers (their teachers and parents) by integrating a locally tailored water conservation education program into schools.

The program's key objectives were as follows:

1. Provide teachers with customized lesson content aligned with Texas state education standards (TEKS), enhancing the existing classroom curriculum.
2. Educate students on the significance of water conservation.
3. Encourage families to adopt water-saving practices.
4. Offer families the opportunity to conserve water and save money through a take-home Water Conservation Kit.

By the Numbers

7
schools participated

10
teachers participated

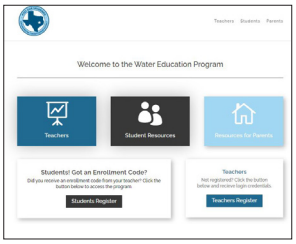
432
students participated

Tinker LLC developed a comprehensive curriculum that encompassed locally relevant lessons, STEM activities, digital program resources, and a Water Conservation Kit equipped with water-saving devices for each student. Through these educational materials and activities, students gained insights into the local water situation, the importance of conserving water, and responsible water usage.

Tinker LLC oversaw all aspects of the program, including school recruitment, lesson planning, day-to-day management, and reporting, ensuring the successful implementation of the initiative.

Below are the program outcomes:

1. **Curriculum.** The curriculum included lessons that were designed to support Texas state education standards (TEKS), featured engaging digital content, and hands-on activities. Each lesson included resources such as video streaming content, online assessments, and more. Participating teachers, students, and parents accessed the curriculum through Tinker's online platform or web application.



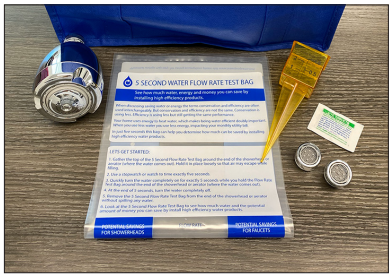
Web Application

2. **School Participation.** During the school year 2022–2023, 7 schools, representing 10 teachers and 432 fourth-grade students participated in the program. Each of these students received a Water Conservation Kit and access to digital learning resources.

School Name	County	Teachers	Students
Snook Elementary School	Burleson County	2	84
Somerville Elementary School	Burleson County	1	35
Cameron Elementary School	Milam County	3	100
Gause Elementary School	Milam County	1	19
Milano Elementary School	Milam County	1	25
Rockdale Intermediate School	Milam County	1	120
Thorndale Elementary	Milam County	1	49

3. **Knowledge Retention.** Students completed a pre-program assessment before beginning the program to determine their baseline knowledge. On average, students correctly answered 6.3 of 10 questions. At the conclusion of the lessons, a post-assessment was administered to evaluate knowledge gain. On average, students correctly answered 9.1 of 10 questions, representing a 44 percent increase!

4. **Water Conservation Kits.** A take-home Water Conservation Kit was provided to 432 fourth-grade students. Each contained products that can be used at home to conserve water. Students work with their parents to use the products and report on their actions. Based on the reported data projected savings can be found below.



Water Conservation Kit

Projected Water Savings

5,655 gallons
Annual Household Savings

2,442,947 gallons
Annual Program-wide Savings

50,528 gallons
Lifetime Household Savings

21,828,131 gallons
Lifetime Program-wide Savings

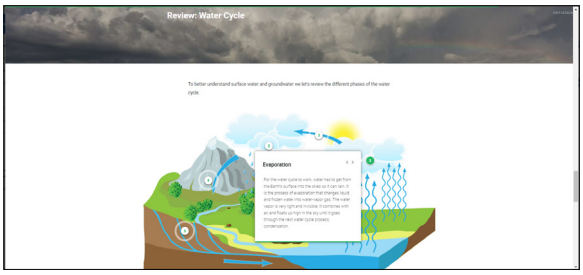
WATER EDUCATION PROGRAM
DESCRIPTION

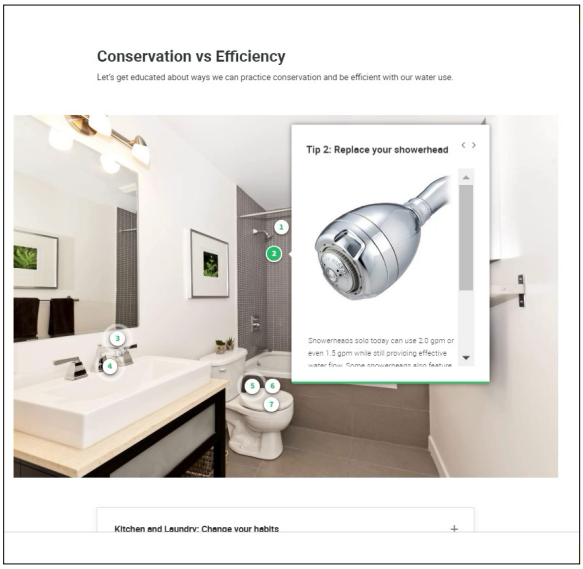
School Year 2022–2023

The Water Conservation Education Program is a locally tailored curriculum aimed at educating fourth-grade students about responsible water usage. Offered as a comprehensive turnkey initiative, Tinker LLC managed all aspects of the program implementation.

Program Curriculum:

Tailored for fourth-grade, the curriculum was crafted to be delivered by classroom teachers, seamlessly integrating into the current classroom setup. Lessons covered essential topics such as groundwater, local water, drought, and water conservation. Aligned with TEKS, each lesson featured engaging digital content, hands-on classroom activities, on-demand video content, and online assessments.





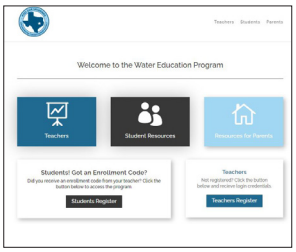
Custom Lessons

Participants accessed the curriculum through Tinker's specialized web application, offering lesson plans, teacher slide decks, custom videos, and classroom activities. For students, the application included homework exercises, assessments, water conservation kit activities, leaderboards, video contest details, and artwork contest information.

Program Delivery:

Tinker gathered enrollment commitments from fourth-grade teachers using diverse recruitment methods. Enrolled teachers received a classroom set of Water Conservation Kits along with physical materials, in addition to access to the web application. Teachers utilized these resources to deliver the curriculum to their students.

The digital delivery through the web application enabled detailed program tracking, informing specific actions taken by program staff. Collected data were accessible through an online dashboard, with District staff having credentials to monitor program progress.



Web Application

Upon completing the classroom lessons, each student received a Water Conservation Kit containing water-saving devices. In the final lesson, students engaged in exercises using these devices, allowing their families an immediate opportunity to consistently conserve water.

Throughout the program, students participated in simple surveys and assessments. The collected data were analyzed to measure the curriculum's impact. At the end of the unit, students and parents pledged to continue conserving water.

At the conclusion of the school year, all lesson data and predefined success metrics were gathered to compile this Annual Report.

WATER EDUCATION PROGRAM
TIMELINE

Phase 1: Launch

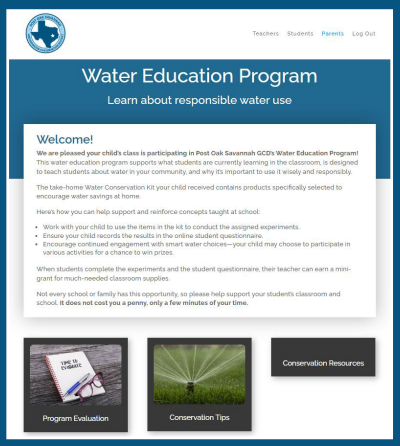
		Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
Phase 1: Launch	Contract Executed	■										
	Branding information provided	■										
	Incentive programs developed	■										
	Print & digital materials published		■									
	Quality control checks performed		■									
	Eligible school information identified	■										
Phase 2: Implementation	Teachers introduced to the program		■	■								
	Participation commitments collected		■	■	■	■	■	■	■			
	Access to digital materials granted		■	■	■	■	■	■	■	■		
	Materials and kits shipped		■	■	■	■	■	■	■	■		
	Communication with teachers		■	■	■	■	■	■	■	■	■	
	Collection & evaluation of program data		■	■	■	■	■	■	■	■	■	
Phase 3: Reporting	**Program closed to participation**										■	■
	Program data compiled and analyzed										■	■
	Final report developed and delivered											■

Phase 1: Launch

During the program, teachers, students, and parents were provided with a variety of resources expertly designed to educate them about water conservation and encourage water conservation behaviors via the web application. These resources, including a printed teacher guide, parent letter, and online lesson materials, were customized to feature the District.

These resources were designed to facilitate successful instruction, stimulate engagement, and build relationships with the participants. The resources provided are described below.

PARENT PROGRAM RESOURCES

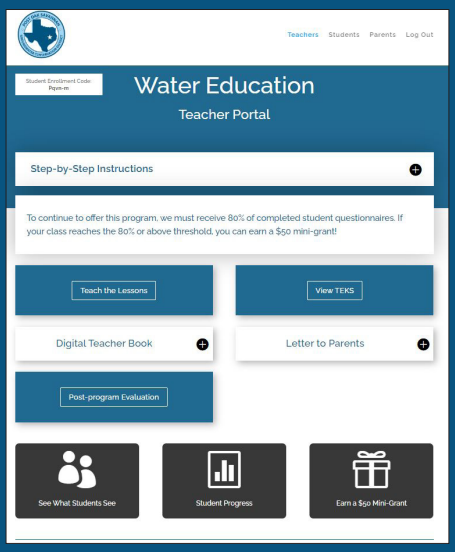


DIGITAL MATERIALS

Parents of participating students are provided access to the parent portal within the web application. Resources available include:

- Parent letter describing the program, the program goals, and the water conservation opportunities available
- Access to additional water conservation resources offered by the District
- Program Evaluation

TEACHER PROGRAM RESOURCES



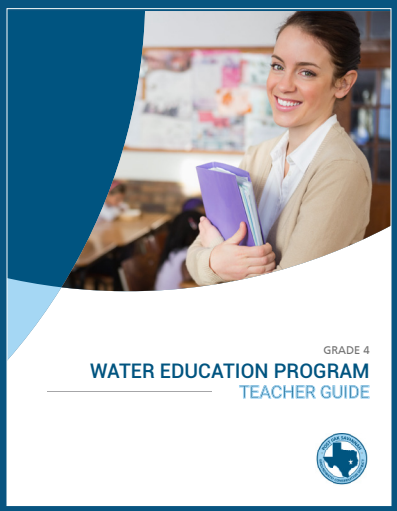
DIGITAL MATERIALS

Each teacher was provided access to unique grade level resources hosted in the teacher portal found in the web application. Grade level resources included:

- Lesson plans
- Digital slides for classroom presentations
- Video content
- Online homework exercises
- Assessments

Each teacher was also provided access to general program related resources hosted in the teacher portal found in the web application. General resources included:

- Instructions to guide teachers through the administration of the program
- Supported TEKS
- Letter to parents in English and Spanish
- Post-program Evaluation
- Student progress reporting

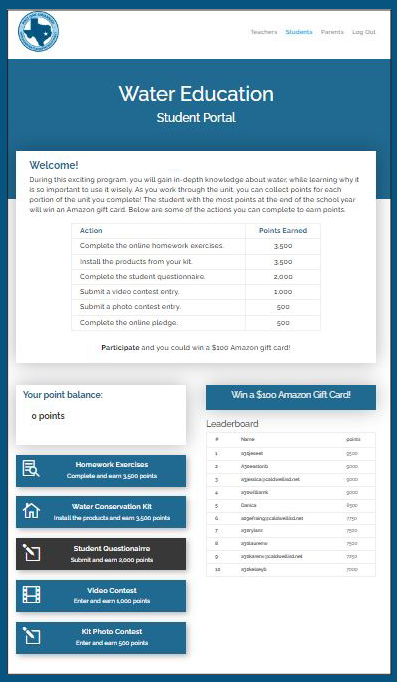


SUPPORTING PHYSICAL MATERIALS

Participating teachers were provided a printed, grade specific, Teacher Guide to support the digital resources. The Teacher Guide included the following:

- Program goals
- Instructions to administer the program
- Lesson plans
- Contest and mini-grant information
- Answer keys

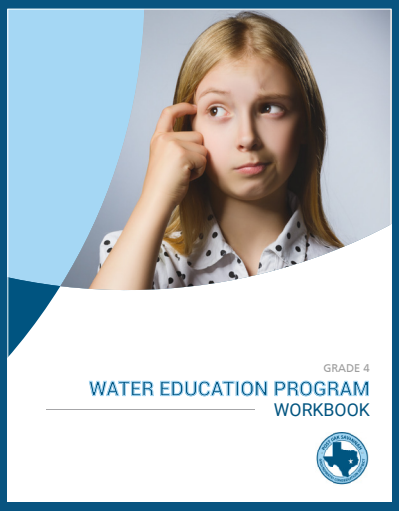
STUDENT PROGRAM RESOURCES



DIGITAL MATERIALS

Students were provided access to the student portal within the web application. Resources available included the following:

- Homework exercises
- Instructions for installing the products inside the kits
- Access to digital lessons and assessments
- The student leaderboard
- Access to water conservation information found on the District website



SUPPORTING PHYSICAL MATERIALS

Participating students were provided a Water Conservation Kit as well as a student workbook to support the digital resources. The student workbook included the following:

- Classroom activity worksheets
- Classroom assessments
- The Water Conservation Kit product savings calculations worksheets

WATER EDUCATION PROGRAM
PROGRAM CURRICULUM

Phase 2: Implementation

The curriculum was developed specifically for fourth-grade students attending schools in Milam and Burleson Counties. This innovative curriculum was crafted with the following key objectives in mind:

1. **Teacher-Centric Approach:** Crafted to be seamlessly delivered by classroom teachers, ensuring a smooth integration into the existing classroom environment.
2. **TEKS Standards Alignment and 5E Model:** Aligned with the TEKS Education Standards, the lessons are structured similarly to the 5E model, providing a comprehensive and locally-relevant educational experience.
3. **Engaging Lesson Plans:** Each lesson plan was designed to foster dynamic class discussions, encouraging active student participation.
4. **Grade-Specific Content:** Tailored content for the fourth-grade level ensures that students receive age-appropriate and relevant information.

The curriculum delves into essential topics:

a. Our Water:
   - Understanding the water cycle.
   - Recognizing the vital role of the water cycle in the region's ecology.
   - Exploring the sources and distribution of potable water.

b. Groundwater:
   - Explaining how aquifers function.
   - Identifying our groundwater sources.

c. Drought:
   - Comprehensive exploration of the relationship between precipitation patterns and drought.
   - How responsible citizens can prepare for a drought.

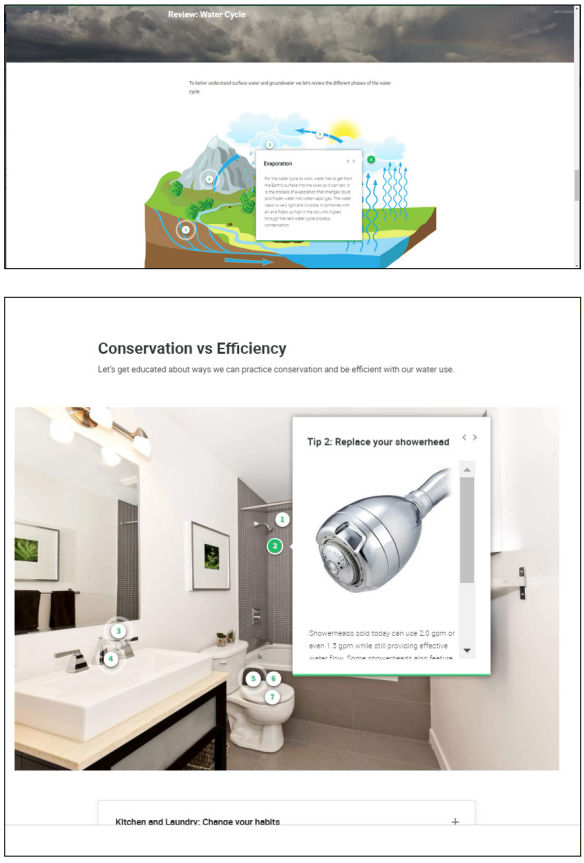
d. Non-point Source Pollution:
   - Identification and root causes of non-point source pollution.
   - Non-point source pollution prevention.

e. Water Conservation and Water Efficiency:
   - Connecting water conservation and efficiency to water management.
   - Learning practical water conservation strategies.
   - Exploring the Water Conservation Kit

Access to the curriculum is facilitated through a customized version of Tinker's proprietary web application. Teachers and students also receive printed guides to augment their learning experience. The online platform offers a wealth of resources, including:

1. **Lesson Plans:** Comprehensive guides for educators.
2. **Tutorial Videos**: Engaging teaching tutorials for in-depth understanding.
3. **Classroom Activity Demos**: Videos demonstrating the hands-on classroom activities.
4. **Teacher Slide Decks:** Downloadable presentation materials.
5. **Assessment Tools:** Varied assessment methods ensuring student comprehension.
6. **Interactive Homework:** Engaging exercises which incorporates videos, interactive digital activities, labeled graphics, and flash card grid activities.
7. **Student Competitions:** Detailed information available, enhancing student participation.

Every lesson is crafted to be engaging, ensuring optimal knowledge retention for students.



Custom Lessons

WATER EDUCATION PROGRAM
WATER CONSERVATION KITS

Phase 2: Implementation

Following the Water Conservation at Home classroom lesson, the program took a hands-on approach to instill lasting change. Each student was equipped with a Water Conservation Kit, emblazoned with the District logo.

These thoughtfully curated kits comprised of essential water-saving devices, including:

- showerhead
- toilet leak detection tablets
- two faucet aerators
- outdoor sprinkler gauge

Each item was chosen to maximize water efficiency, addressing different areas of water consumption in a home setting.

Water Conservation Kit

Students, guided by step-by-step instructions and video tutorials, utilized our online platform to complete the product installation activities, or kit activities. Simultaneously, they delved into their workbooks, calculating the water savings associated with the specific products they installed from the Water Conservation Kit. This dual approach not only reinforced theoretical knowledge but also encouraged practical application, empowering students to actively engage in water conservation endeavors.

Through their active participation and the data shared, students became the driving force behind significant water savings in their homes. The impact of their efforts was evaluated, revealing substantial projected water savings resulting from the effective utilization of these kits. For projected water savings, please refer to Appendix A.

Outdoor Sprinkler Gauge

This hands-on experience not only enriched the students' understanding of water conservation but also transformed them into advocates for water conservation practices within their communities. By equipping them with the tools and knowledge needed to make a difference, we are fostering a generation of water conscious individuals, ensuring a brighter, water-efficient future for all.

WATER EDUCATION PROGRAM
OUTREACH AND RECRUITMENT

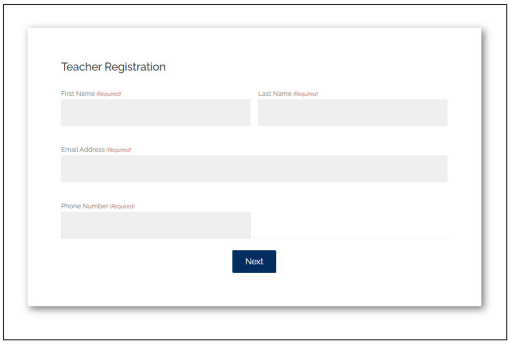
Phase 2: Implementation

Starting in August 2022, Tinker initiated the planning phase for reaching out to and recruiting qualified teachers. These eligible teachers were specifically those teaching fourth-grade within schools served by the District. Tinker's staff conducted thorough research on schools and teachers, and actively began recruiting eligible teachers to the program.

The program was extended to teachers using various communication tools to introduce the program and secure enrollment commitments. These tools included:

1. Email templates
2. Phone scripts
3. Promotional flyer
4. Recruitment video

Teachers were encouraged to enroll using the online form. Tinker successfully secured commitments from 7 schools, representing 10 teachers and 432 fourth-grade students. Recruitment activities concluded in April 2023.



Online Teacher Enrollment Form

Teacher Recruitment Video

WATER EDUCATION PROGRAM
PARTICIPATION

Phase 2: Implementation

During the 2022–2023 school year, elementary school teachers at schools served by the District were introduced to the program and asked to participate. Commitments were received from 7 schools representing 432 fourth-grade students and 10 teachers.

County	School	Teachers	Students	Total
Burleson County	Snook Elementary School	2	84	86
Burleson County	Somerville Elementary School	1	35	36
Milam County	Cameron Elementary School	3	100	103
Milam County	Gause Elementary School	1	19	20
Milam County	Milano Elementary School	1	25	26
Milam County	Rockdale Intermediate School	1	120	121
Milam County	Thorndale Elementary	1	49	50
	Totals:	10	432	442

WATER EDUCATION PROGRAM

STUDENT POST-PROGRAM EVALUATION

Phase 3: Reporting

At the conclusion of the unit students were asked to complete a post-program evaluation. Responses are found below:

STUDENT POST-PROGRAM EVALUATION

1. Did you enjoy the Program?	
2. Was the on-line content easy to use?	YES: 91%
3. Would you like to see this program continue?	YES: 88%
4. Did you and your family change the way you use water?	YES: 89%

WATER EDUCATION PROGRAM

PRE-, POST-PROGRAM ASSESSMENTS

Phase 3: Reporting

To determine the effectiveness of the program, we collected pre- and post-program data to assess changes in students' knowledge, attitude, and behavior with respect to water conservation. The outcome is provided below.

PRE-ASSESSMENT

ON THE AVERAGE STUDENTS CORRECTLY ANSWERED 6.3 OUT OF 10 QUESTIONS IN THE BASELINE STUDENT ASSESSMENT **PRIOR** TO BEGINNING THE PROGRAM

National Average: 6.64

POST-ASSESSMENT

ON THE AVERAGE STUDENTS CORRECTLY ANSWERED 9.1 OUT OF 10 QUESTIONS IN THE POST STUDENT ASSESSMENT **AFTER** COMPLETING THE PROGRAM

National Average: 8.57

44%

AFTER PARTICIPATING IN THE PROGRAM, STUDENTS INCREASED THEIR WATER KNOWLEDGE BY CORRECTLY ANSWERING 2.8 MORE QUESTIONS OVER THE BASELINE. THIS IS A 44% INCREASE IN WATER KNOWLEDGE!

National Average: 29%

**The national average is based on nationwide student assessment data gathered from comparable water conservation education programs that were developed and implemented by Tinker LLC.*

WATER EDUCATION PROGRAM
LESSON ASSESSMENTS

Phase 3: Reporting

At the end of every lesson, students were required to complete a lesson assessment. This assessment was crafted to gauge their understanding of the topic and reinforce the educational content. The results were utilized to assess the effectiveness of each lesson. The table below displays the average student scores obtained.

Lesson	Assessment	National Average
Groundwater & Surface Water	90%	89%
Drought	87%	90%
Water-Energy Nexus	81%	83%
Non-Point Source Pollution	90%	90%
Conservation & Efficiency	91%	91%
Course Review	91%	92%

**The national average is based on nationwide student assessment data gathered from comparable water conservation education programs that were developed and implemented by Tinker LLC.*

WATER EDUCATION PROGRAM

TEACHER POST-PROGRAM EVALUATION

Phase 3: Reporting

At the conclusion of the program, teachers were asked to complete a post-program evaluation. The outcome is below.

TEACHER POST-PROGRAM EVALUATION

1. Overall how satisfied were you with the program:	
2. Did this program support education standards in your grade level?	YES: 100%
3. Was the on-line content and lessons easy to use?	YES: 92%
4. Was the program staff knowledgeable and courteous?	YES: 100%
5. Did the program staff effectively answer all of your questions?	YES: 100%
6. How satisfied were your students with this program?	
7. Would you conduct the program again if given the opportunity?	YES: 100%
8. Would you recommend this program to your colleagues?	YES: 100%

WATER EDUCATION PROGRAM
PROJECTED WATER SAVINGS

Phase 3: Reporting

Through the program 432 Water Conservation Kits were distributed to participants. The kits were packed with high efficiency products that when installed help to curb household water usage. Students work with their parents to install the products and report their actions. The outcomes are found below.

Number of Kits: 432

54% of students reported installing the showerhead

61% of students reported installing the first faucet aerator

51% of students reported installing the second faucet aerator

69% of students reported using the toilet leak detector tablets

- 10% of students reported the toilet was leaking
- Of those students with leaky toilets, 25% reported their parents fixed the leak.

72% of students reported using the sprinkler gauge

Using the data collected, we calculated the projected resource savings. Projections are found below:

Projected Water Savings

5,655 gallons
Annual Household Savings

2,442,947 gallons
Annual Program-wide Savings

50,528 gallons
Lifetime Household Savings

21,828,131 gallons
Lifetime Program-wide Savings

WATER EDUCATION PROGRAM
APPENDIX A

Projected Savings

FAUCET AERATOR RETROFIT #1

Projected Savings

Reported Inputs

Average household size:	4.91	people
Percent of homes with electric water heat:	59%	
Percent of homes with natural gas water heat:	32%	
Percent of homes with propane water heat:	9%	
Retrofit bathroom aerator installation rate:	61%	
Participants using kits:	432	students

Assumed Inputs

Weighted average daily per capita reduction in water consumption:	0.6	gallons per day[1]
Percent of faucet water used in a household is hot water:	70%	[1]
Temperature of incoming cold water:	55°	[1]
Temperature of outgoing hot water:	120°	[1]
Electric hot water heater efficiency:	90%	Efficient[1]
Natural Gas hot water heater efficiency:	60%	Efficient[1]
Product life:	5	years[2]

Outcomes

Projected daily water savings for all households:	776.33	Gallons[1]
Projected daily electric savings for all households:	56.60	kWh[1]
Projected daily natural gas savings for all households:	1.57	Therms[1]
Projected daily GHG reduction for all households:	0.815	Metric Tons[3]

[1] WaterSense® High-Efficiency Lavatory Faucet Specification Supporting Statement. EPA, 2007, Appendix A: Calculations and Key Assumptions.

[2] Manufacturer

[3] "Greenhouse Gas Equivalencies Calculator." EPA, Environmental Protection Agency, 09 June 2023, www.epa.gov/energy/greenhouse-gas-equivalencies-calculator.

FAUCET AERATOR RETROFIT #2

Projected Savings

Reported Inputs		
Average household size:	4.91	people
Percent of homes with electric water heat:	59%	
Percent of homes with natural gas water heat:	32%	
Percent of homes with propane water heat:	9%	
2nd retrofit bathroom aerator installation rate:	51%	
Participants using kits:	432	students
Assumed Inputs		
Weighted average daily per capita reduction in water consumption:	0.6	gallons per day[1]
Percent of faucet water used in a household is hot water:	70%	[1]
Temperature of incoming cold water:	55°	[1]
Temperature of outgoing hot water:	120°	[1]
Electric hot water heater efficiency:	90%	Efficient[1]
Natural Gas hot water heater efficiency:	60%	Efficient[1]
Product life:	5	years[2]
Outcomes		
Projected daily water savings for all households:	649.06	Gallons[1]
Projected daily electric savings for all households:	47.32	kWh[1]
Projected daily natural gas savings for all households:	1.31	Therms[1]
Projected daily GHG reduction for all households:	0.267	Metric Tons[3]

[1] WaterSense® High-Efficiency Lavatory Faucet Specification Supporting Statement. EPA, 2007, Appendix A: Calculations and Key Assumptions.

[2] Manufacturer

[3] "Greenhouse Gas Equivalencies Calculator." EPA, Environmental Protection Agency, 09 June 2023, www.epa.gov/energy/greenhouse-gas-equivalencies-calculator.

SHOWERHEAD RETROFIT

Projected Savings

Reported Inputs

Average household size:	4.91	people
Full bathrooms per home:	1.78	bathrooms
Previous showerhead flow rate:	2.88	G.P.M.
Retrofit showerhead flow rate:	1.39	G.P.M.
Percent of homes with electric water heat:	59%	
Percent of homes with natural gas water heat:	32%	
Percent of homes with propane water heat:	9%	
Retrofit showerhead installation rate:	54%	
Participants using kits:	432	students

Assumed Inputs

Showers per day per person:	0.67	showers[1]
Average length of use:	8.2	minutes[1]
Percent of showerhead water that is heated:	73%	hot water[1]
Temperature of incoming cold water:	55°	[1]
Temperature of outgoing hot water:	120°	[1]
Product life:	10	years[2]

Outcomes

Projected daily water savings for all households:	5,267.61	Gallons[1]
Projected daily electric savings for all households:	408.38	kWh[1]
Projected daily natural gas savings for all households:	11.07	Therms[1]
Projected daily GHG reduction for all households:	2.29	Metric Tons[3]

[1] *WaterSense® Specification for Showerheads Supporting Statement. EPA, 2010, Appendix A: Calculations and Key Assumptions.*

Step 1 [(Previous showerhead flow rate - Retrofit showerhead flow rate) x Average length of use: 8.2min x Showers per day per person: 0.67 x Average household size] ÷ Full bathrooms per home = gallons saved per day

**Equation is divided by full bathrooms per home because we only provide one showerhead*

Step 2 gallons saved per day x 365 days = gallons saved per year

Step 3 gallons saved per year x retrofit showerhead installation rate x participants = gallons saved per year program-wide

Step 4 gallons saved per year program-wide x Conversion Factor (acre-feet per gallon): 0.00000306888324597 = Acre Feet

[2] *Manufacturer*

[3] *"Greenhouse Gas Equivalencies Calculator." EPA, Environmental Protection Agency, 09 June 2023, www.epa.gov/energy/greenhouse-gas-equivalencies-calculator.*