

# WATER EDUCATION PROGRAM **ANNUAL REPORT**

# 21

*Post Oak Savannah Water Education Program  
implemented by Tinker LLC*

WATER EDUCATION PROGRAM



**TINKER**

ENERGY + WATER  
EDUCATION PROGRAMS

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WATER EDUCATION PROGRAM

## MESSAGE FROM **TINKER LLC**

•  
*Joseph Thrasher*

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Dear Doug,

We wanted to take a moment to express our appreciation and gratitude for selecting Tinker as the vendor to deliver your Water Conservation Education Program. The Teachers, Students and Parents within your community were incredible to work with. Through their feedback it's clear they are grateful to you for supporting this initiative in their schools. It was such a great group of people to work with!

Cheerfully,

A handwritten signature in blue ink, appearing to read 'Joe Thrasher', with a long horizontal flourish extending to the right.

Joseph Thrasher





# TINKER LLC WATER EDUCATION PROGRAM

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## WATER EDUCATION PROGRAM AT A GLANCE

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*School Year 2020-2021*

### ACTIVITY OF TINKER LLC

The Water Conservation Education program is an essential element of the Post Oak Savannah Groundwater Conservation District water conservation plan. The program educated 4th grade students and their parents about water conservation.

This school year, Tinker LLC was selected to support the District's water conservation education efforts through the end to end implementation of the 4th grade Water Education Program. The program includes a digital water conservation curriculum provided to elementary schools served by the District. Designed to demonstrate how small changes in water use can make a big impact on water consumption, students learn about responsible water use and are taught appropriate water use skills that can be used for a lifetime.

The program features on-demand teacher training, classroom lessons that support Texas Essential Knowledge and Skills (TEKS) education standards, and water conservation kits. Tinker LLC managed all aspects of program design and implementation

including; school recruitment, lesson development, day to day program management and reporting

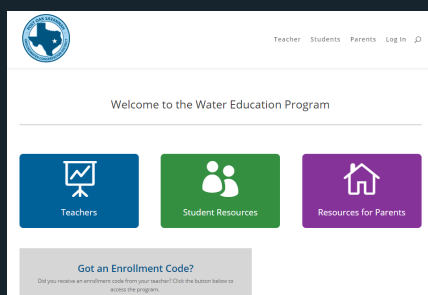
Through the program, four hundred seventy-one (471) water conservation kits were distributed by teachers to students. The kits were packed with high efficiency products that when installed help to curb household water usage. Students work with their parents to install the products and report their actions. Based on the reported data the potential water savings are projected to be:

Annual household savings:	4,890 gallons
Annual program-wide savings:	7.07 acre-feet
Lifetime household savings:	39,982 gallons
Lifetime program-wide savings:	57.79 acre-feet



### **Program is Teacher Delivered**

The curriculum employed teacher instructed classroom lessons that included hands-on student activities while supporting TEKS.



### **Digital Tools**

The curriculum was delivered digitally using resources from our on-line Web App. Resources such as streaming video content, on-line assessments, virtual labs and more.



### **Water Conservation Kit**

Students were given a Water Conservation Kit that was packed with high efficiency home water use products that help to curb water usage.



### **School Participation**

Nine Elementary Schools representing 471 fourth grade students and 11 teachers were recruited and implemented the program



### **Knowledge Gained**

In the baseline assessment the average student correctly answered 6.19 out of 12 questions. After participating, the average student correctly answered 3.48 more questions over the baseline. An increase of 56% in water knowledge!



### **Retrofit Activities**

61% of students that reported retrofitting their current showerhead with the high efficiency one from the Kit.

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## WATER EDUCATION PROGRAM **DESCRIPTION**

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*School Year 2020-2021*

Tinker's Water Conservation Education Program is a digital science-based curriculum designed to teach elementary school students about water and how to use it wisely. The curriculum is particularly engaging for this generation of students because it is fun, easy to use and can demonstrate water conservation concepts in ways print curriculum cannot.

Delivered by the classroom teacher, the curriculum fits seamlessly within the current classroom setting. Materials are aligned to support TEKS education standards, feature engaging digital content, and hands-on activities.

Using resources from our on-line platform, or Web App, the teacher accesses an on-demand lesson training module. Armed with the information learned from the training, the teacher delivers the curriculum through five unique classroom lessons. Each lesson includes resources such as streaming video content, on-line assessments, virtual labs and more.

Filled with new water conservation knowledge, each student is given a Water Conservation Kit containing home water saving devices. During the final lesson, "At Home", the student completes homework exercises that require measuring current home water use, retrofitting home water use devices with the high efficiency devices from their kit, and measuring their new home water use. This gives families the opportunity to immediately and consistently conserve water in their home.

Throughout the program students complete simple surveys and assessments. This data is collected, analyzed and summarized to gauge the impact of the curriculum on students. At the close of the unit, the student with their parents, complete a pledge to continue to conserve water.

To support classroom activities, the Web App includes on-line portals designed specifically for students and parents. Each portal disseminates relevant information to the user and offers the utility additional engagement opportunities. This only furthers the program's ability to effect change.

At the end of the school year all data generated from the lessons as well as any predefined success metrics are collected and presented in this Final Report.





K. Shoemake, Teacher  
Thorndale Elementary School

"I love the part of teaching this younger generation about conservation and recycling. They are so unaware at times of where things come from and how we need to conserve and protect our environment."

T. Pipes, Teacher  
Caldwell Intermediate School

"My favorite thing about the program was that it was interactive. It really made it real by bringing in their homes."

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## TINKER LLC STAFF

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### *The Team*

#### **JOSEPH THRASHER**

##### ***President***

Joe Thrasher serves as Tinker's President. With twenty years of experience in designing and implementing water and energy education programs, Joe is an expert in the efficiency education space. Joe is responsible for the overall design and implementation of Tinker's efficiency programs as well as the implementation of the company's strategic plan.

#### **MIKE HENRY**

##### ***CTO***

Mike is Tinker's chief software architect and serves as Tinker's CTO. He has twenty-one years of experience, having participated in a wide range of software endeavors spanning from flagship and commercial products to mission critical internal applications. Mike drives all things related to Tinker's web app and back end databases.

#### **JENNI KAZAS**

##### ***CTO***

Mrs. Kazas has six years of experience managing day-to-day school outreach operations for education programs. She is responsible for reaching outreach related program goals while staying within the budget and program timeline. She has participated in many efficiency education programs and managed budgets totaling more than \$12.9 million.

#### **HEATHER DEVANY**

##### ***Director of Education***

Heather Devany serves as our Director of Education. She oversees the creation and development of Tinker's education content and delivery. Mrs. Devany has spent twenty years in education. Three years as an administrator and seventeen years as a classroom teacher. She has taught 2nd, 3rd, 5th and 6th grade and has twice been a member of the California Distinguished School writing committee.

#### **DAN NATIVIDAD**

##### ***Director of Marketing***

Dan Natividad serves as our Director of Marketing. He oversees the outreach and marketing of the program to schools and teachers. His marketing campaigns utilize a wide range of marketing tactics such as grass-roots social campaigns, traditional media, and digital marketing. Dan has spent seventeen years implementing strategic marketing plans for organizations.



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## WATER EDUCATION PROGRAM OPERATIONS

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### *Key Tasks*

The successful administration of the Water Conservation Education Program was guided by Tinker's proven operational plan. The program operated in three distinct phases:



### **PHASE 1: LAUNCH**

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#### **The foundation of the Water Conservation Education Program.**

Program launch includes outreach and implementation planning as well as customization and production of outreach, curriculum and kit materials.



### **PHASE 2: IMPLEMENTATION**

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#### **Stakeholder objectives merge to achieve desired outcomes.**

Implementation includes teacher outreach and enrollment, and the shipment of curriculum materials and Water Conservation Kits.



### **PHASE 3: ASSESSMENT & REPORTING**

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#### **Data is collected, measured and assessed to determine outcomes.**

Assessment and reporting includes collection of programmatic data through various mediums, effectively evaluating the data and generating this report.

## WATER EDUCATION PROGRAM TIMELINE

### Phase 1: Launch

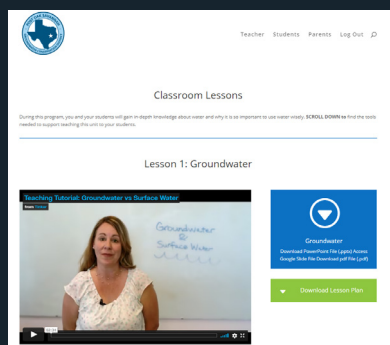
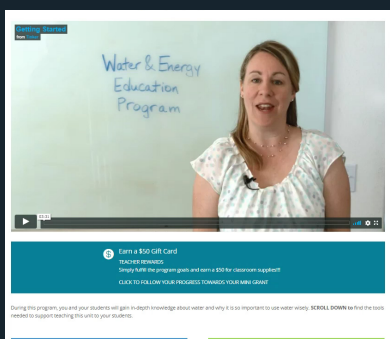
		Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June
Phase 1: Launch	Contract Executed											
	Branding information provided											
	Incentive programs developed											
	Print & digital materials published											
	Water conservation kits built											
	Quality control checks performed											
	Eligible school information identified											
Phase 2: Implementation	Teachers introduced to the program											
	Participation commitments collected											
	Access to digital materials granted											
	Materials & Water Conservation 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											

## WATER EDUCATION PROGRAM DIGITAL & PRINT MATERIALS

### Phase 1: Launch

During the Water Education Program teachers, students and parents are provided with a variety of resources expertly designed to educate about water conservation and encourage water conservation behaviors via the online web-app. Select print materials are also provided in support of the online resources. Each resource is designed to facilitate successful instruction and to stimulate engagement within each participating segment. The resources provided for each segment are described below.

### TEACHER PROGRAM RESOURCES



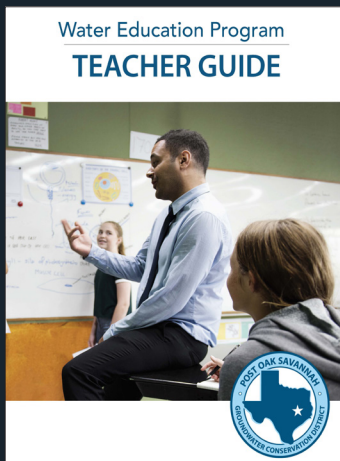
### DIGITAL MATERIALS

Participating teachers are provided access to the teacher portal within the web app. Resources available include:

- Video instructions to guide teachers through administration of the program.
- Optional download of step by step administration instructions for reading.
- Digital copies of supporting print materials.
- Access to each lesson within the curriculum.
- Lessons can contain
  - On-Demand training videos
  - Digital classroom presentation tools
  - Streaming video content
  - Classroom activities
  - Assessments and more!
- Access to the digital Program Evaluation Survey.



## TEACHER PROGRAM RESOURCES

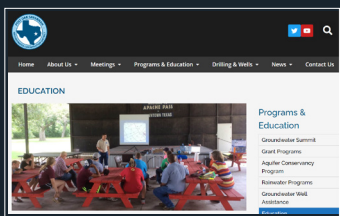
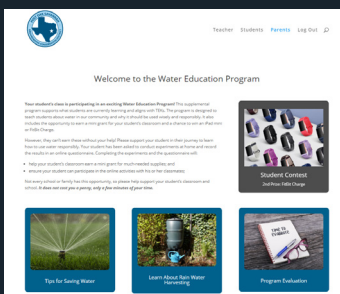


### SUPPORTING PHYSICAL MATERIALS

Participating teachers are provided print materials to support the digital resources. These include:

- Water Education Program Teacher Guide. This contains instructions to guide teachers through administration of the program.
- Classroom set of Letters for parents in English and Spanish.
- Sample Water Conservation Kit.

## PARENT PROGRAM RESOURCES

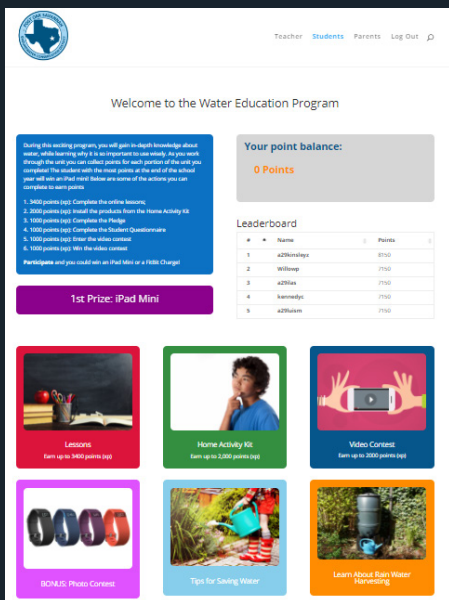


### DIGITAL MATERIALS

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

- Access to additional water conservation resources offered by the District
- Video instructions guiding participants through the installation of the products inside the kit.
- Access to the digital Program Evaluation Survey.
- Access to the water conservation knowledge quiz.
- Integration of water conservation resources from the District's web page

## STUDENT PROGRAM RESOURCES

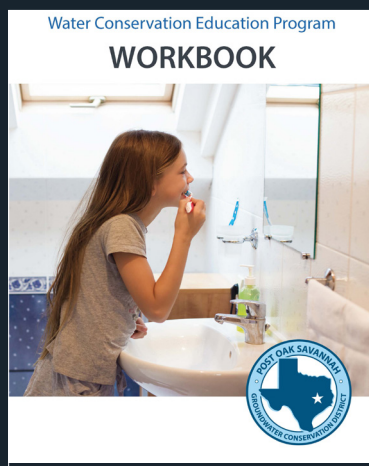


### DIGITAL MATERIALS

Students are provided access to the student portal within the web app. Resources available include:

- Video instructions guiding participants through the installation of the products inside the kit.
- Access to digital Questionnaires and Assessments.
- Access to the water conservation knowledge quiz.
- Photo and video contest general and entry information.
- Additional water conservation information provided by the District

## STUDENT PROGRAM RESOURCES



### SUPPORTING PHYSICAL MATERIALS

Participating students are provided print materials to support the digital resources. These include:

- Water Education Program Student Workbook. This contains worksheets and activities to support the digital classroom lessons.
- Letter for parents in English and Spanish.

## WATER EDUCATION PROGRAM PARTICIPATION

### *Phase 2: Implementation*

During the 2020-2021 school year, elementary school teachers at schools served by the District were introduced to the program and asked to participate. Commitments were received from nine (9) schools representing 471 fourth grade students and 11 Teachers. The map displaying the participating schools can be found on the next page.

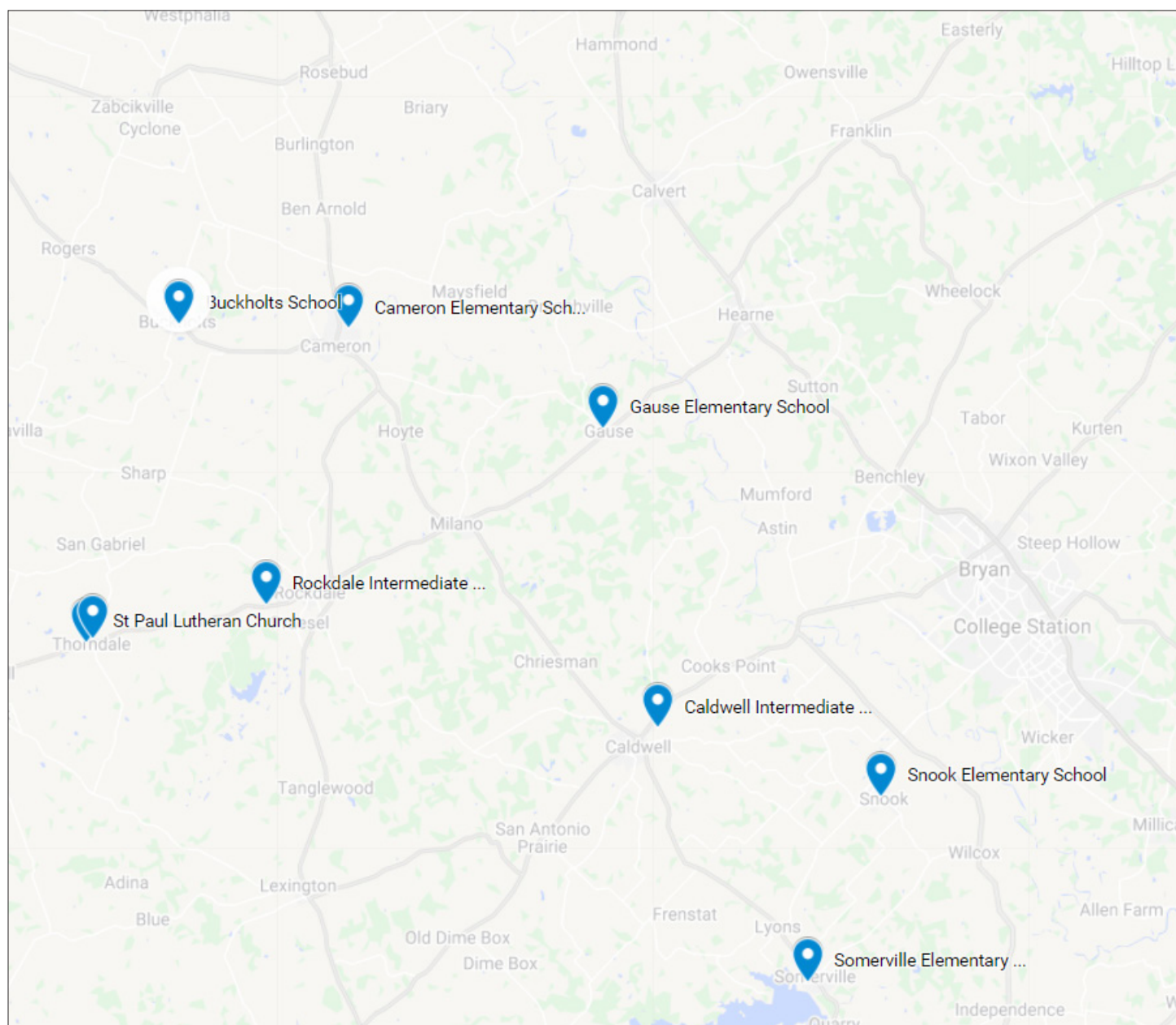
School	Teachers	Students	Total
Buckholts School	1	7	8
Caldwell Intermediate School	1	121	122
Cameron Elementary School	4	213	217
Gause Elementary School	1	32	33
Rockdale Intermediate School	1	7	8
Snook Elementary School	1	35	36
*Somerville Elementary School*	0	4	4
St. Paul Lutheran Church and School	1	17	18
Thorndale Elementary School	1	35	36

\*During the previous school year, Somerville Elementary School committed to participating in and received materials from the prior vendor. However, they did not use the program materials and choose to use them during this school year.



## WATER EDUCATION PROGRAM PARTICIPATION MAP

*Phase 2: Implementation*



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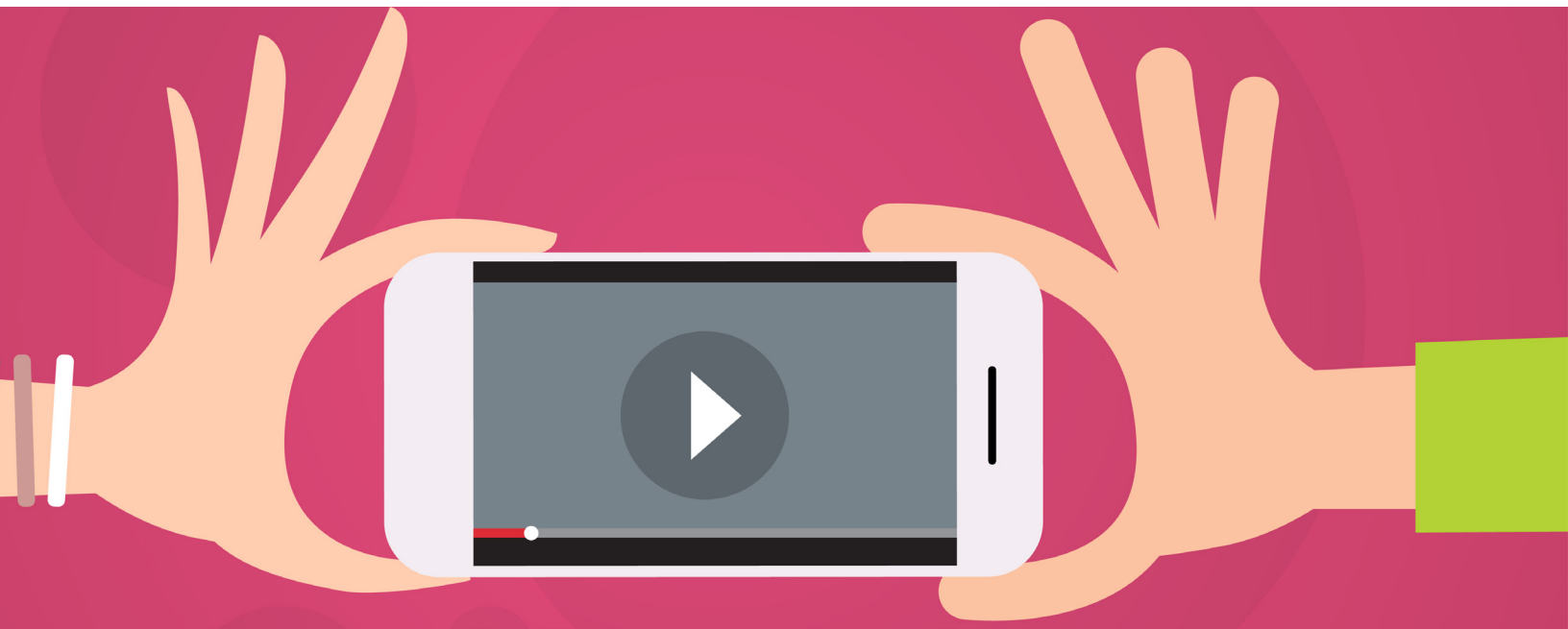
## WATER EDUCATION PROGRAM **VIDEO CONTEST**

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*Phase 2: Implementation*



A fun component of the Water Education Program is the student video contest available to participating students. Students can create a short 2 to 3 minute video about water conservation for a chance to win an iPad mini. Videos can be uploaded through the Tinker web app. Through the program we received two submissions.



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## WATER EDUCATION PROGRAM **CLASSROOM CONTENT**

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### *Phase 2: Implementation*

The Water Education Program is designed to be delivered and taught by the classroom teacher. All resources needed to complete program are provided including on-demand teacher training. The majority of materials are delivered online which provides convenient and instant access making materials available with just a few simple steps.

The program material is designed to supplement the science, math and language arts curriculum already taught in the classroom. Moreover, each lesson supports federal and state education standards and is customized to include regional and relevant information. This increases engagement opportunities furthering the programs ability to affect change.

Typical lessons include:

1. Groundwater
2. Drought
3. Water & Energy Nexus
4. Efficiency & Conservation
5. Non-point Source Pollution
6. Water at Home





## WATER EDUCATION PROGRAM CONSERVATION KITS

### Phase 2: Implementation

Each student and teacher participating in the Water Conservation Education Program received a take home Water Conservation Kit. The kit was full of tools and retrofit devices that contribute to immediate water savings at home.

*"The kit we got was my favorite part because i got to install it with my Father."*

**Amayah, Student**  
**Freedom Shores Elementary**

Each kit contained the following items:

- Showerhead  
*1.5 GPM / Watersense*
- Kitchen Faucet Aerator  
*1.5 GPM, dual function, swivel*
- Bathroom Faucet Aerator  
*1.0 GPM*
- Water Flow Rate Bag
- Toilet Leak Detector Tablets
- Outdoor Watering Gauge
- Direct Printed Reusable Tote Bag
- 100% Recycled Corrugated Insert



#### Environmentally Responsible

The Water Conservation Kit was delivered in a re-usable grocery tote. The tote was branded with the Post Oak Savannah Groundwater Conservation District logo and included the language, "Serving Milam and Burleson Counties"



#### Innovative Ideas

Each water conservation device was nestled in a 100% recycle corrugated tray. The tray has a printable area used to provide access to the installation instructions as well as preventing the devices from moving during transportation.



#### Mobile Content

QR codes used to access on-line product installation videos were directly printed on the 100% recycled corrugated tray.

## WATER EDUCATION PROGRAM STUDENTS ASSESSMENTS

### Phase 3: Reporting

During the Water Education Program, data was collected at various points to measure student knowledge gained during the program. To identify the baseline knowledge of water concepts, students completed a pre-program assessment prior to beginning the program. At the end of each lesson students completed a lesson assessment. Finally at the close of the program students completed a post-program assessment. The results were used to determine if the lessons were effective thus resulting in a net gain of knowledge of water concepts. The outcome is below:

#### PRE-ASSESSMENT



ON THE AVERAGE STUDENTS CORRECTLY ANSWERED 6.19 OUT OF 12 QUESTIONS IN THE BASELINE STUDENT ASSESSMENT **PRIOR** TO BEGINNING THE PROGRAM

#### POST-ASSESSMENT



ON THE AVERAGE STUDENTS CORRECTLY ANSWERED 9.67 OUT OF 12 QUESTIONS IN THE POST STUDENT ASSESSMENT **AFTER** COMPLETING THE PROGRAM

**56%** 

AFTER PARTICIPATING IN THE PROGRAM, STUDENTS NEARLY DOUBLED THEIR WATER KNOWLEDGE BY CORRECTLY ANSWERING 3.48 MORE QUESTIONS OVER THE BASELINE. DEMONSTRATING A 56% INCREASE IN WATER KNOWLEDGE

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# WATER EDUCATION PROGRAM

## PARTICIPANT EVALUATIONS

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Phase 3: Reporting

At the conclusion of the unit teachers, students and parents were asked to complete an online evaluation of the program. Evaluations were designed to elicit specific feedback from each group. Highlights are below:

### STUDENT PROGRAM EVALUATION

- |  |          |
|--|----------|
| 1. Did you enjoy the Program?                            | ★★★★★    |
| 2. Was the online content easy to use?                   | YES: 98% |
| 3. Would you like to see this program continue?          | YES: 95% |
| 4. Did you and your family change the way you use water? | YES: 97% |



## TEACHER 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 online content and lessons easy to use? YES: 100%

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. In your opinion, were parents effectively engaged? YES: 80%

8. Would you conduct the program again if given the opportunity? YES: 100%

9. Would you recommend this program to your colleagues? YES: 100%

## WATER EDUCATION PROGRAM PROJECTED WATER SAVINGS

### Phase 3: Reporting

Through the program, four hundred seventy-one (471) kits were distributed by teachers to students. 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. Based on the reported data the potential water savings can be projected. The projections are found below.:

### SUMMARY OF PROJECTED ANNUAL SAVINGS FROM KIT RETROFIT

Projected annual <b>HOUSEHOLD</b> water savings via kit retrofit:	4,890.43 gallons
Projected annual <b>HOUSEHOLD</b> electricity savings via kit retrofit:	370.90 kWh
Projected annual <b>HOUSEHOLD</b> natural gas savings via kit retrofit:	12.99 therms
Projected annual <b>PROGRAM-WIDE</b> water savings via kit retrofit:	7.07 acre-feet
Projected annual <b>PROGRAM-WIDE</b> electricity savings via kit retrofit:	174,692 kWh
Projected annual <b>PROGRAM-WIDE</b> natural gas savings via kit retrofit:	6,120 therms

### SUMMARY OF PROJECTED LIFETIME SAVINGS FROM KIT RETROFIT

Projected lifetime <b>HOUSEHOLD</b> water savings via kit retrofit:	39,982 gallons
Projected lifetime <b>HOUSEHOLD</b> electricity savings via kit retrofit:	3,058 kWh
Projected lifetime <b>HOUSEHOLD</b> natural gas savings via kit retrofit:	106.81 therms
Projected lifetime <b>PROGRAM-WIDE</b> water savings via kit retrofit:	57.79 acre-feet
Projected lifetime <b>PROGRAM-WIDE</b> electricity savings via kit retrofit:	1,440,539 kWh
Projected lifetime <b>PROGRAM-WIDE</b> natural gas savings via kit retrofit:	50,306 therms

## SHOWERHEAD RETROFIT

### Projected Savings

#### Reported Inputs

Average household size:	5.03 people
Full bathrooms per home:	2.08 bathrooms
Previous showerhead flow rate:	2.39 gallons
Retrofit showerhead flow rate:	1.34 gallons
Retrofit showerhead installation rate:	61%
Participants:	471 students

#### Assumed Inputs

Showers per day per person:	0.67 showers <sup>1</sup>
Average length of use:	8.2 minutes <sup>1</sup>
Percent of showerhead water that is heated:	73% hot water <sup>1</sup>
Temperature of incoming cold water:	55° <sup>1</sup>
Temperature of outgoing hot water:	120° <sup>1</sup>
Percent of homes with electric water heat:	59% <sup>2</sup>
Percent of homes with natural gas water heat:	41% <sup>2</sup>
Percent of homes with propane water heat:	2% <sup>2</sup>
Product life:	10 years <sup>3</sup>

#### Outcomes

Projected cumulative annual water savings:	4.49 Acre Feet <sup>1</sup>
Projected cumulative annual electric savings:	113,415.81 kWh <sup>1</sup>
Projected cumulative annual natural gas savings:	3,940.72 Therms <sup>1</sup>
Projected cumulative lifetime water savings:	44.90 Acre Feet <sup>1</sup>
Projected cumulative lifetime electric savings:	1,134,158.07 kWh <sup>1</sup>
Projected cumulative lifetime natural gas savings:	39,407.19 Therms <sup>1</sup>

<sup>1</sup> (March 2010). EPA WaterSense Specification for Showerheads Supporting Statement.

<sup>2</sup> (May 2018). EIA Residential Energy Consumption Survey (RECS). Table HC8.6 Water heating in U.S. homes by climate region, 2015. Retrived July 24, 2018 from <https://www.eia.gov/consumption/residential/data/2015/hc/php/hc8.6.php>

<sup>3</sup> Manufacturer

## KITCHEN AERATOR RETROFIT

### Projected Savings

#### Reported Inputs

Average household size:	5.03 people
Retrofit kitchen aerator installation rate:	58%
Participants:	471 students

#### Assumed Inputs

Average length of use:	3.0 minutes per day <sup>1</sup>
Additional length of use for each family member:	0.5 minutes per day <sup>1</sup>
Previous kitchen faucet aerator flow rate:	2.5 G.P.M. <sup>2</sup>
Retrofit kitchen faucet aerator flow rate:	1.5 G.P.M. <sup>3</sup>
Percent of faucet water used in a household is hot water:	70% <sup>4</sup>
Temperature of incoming cold water:	55° <sup>4</sup>
Temperature of outgoing hot water:	120° <sup>4</sup>
Electric hot water heater efficiency:	90% Efficient <sup>4</sup>
Natural Gas hot water heater efficiency:	60% Efficient <sup>4</sup>
Percent of homes with electric water heat:	59% <sup>5</sup>
Percent of homes with natural gas water heat:	41% <sup>5</sup>
Percent of homes with propane water heat:	2% <sup>5</sup>
Product life:	5 years <sup>2</sup>

#### Outcomes

Projected cumulative annual water savings:	1.69 Acre Feet <sup>4</sup>
Projected cumulative annual electric savings:	40,092.69 kWh <sup>4</sup>
Projected cumulative annual natural gas savings:	1,426.27 Therms <sup>4</sup>
Projected cumulative lifetime water savings:	8.44 Acre Feet <sup>4</sup>
Projected cumulative lifetime electric savings:	200,463.46 kWh <sup>4</sup>
Projected cumulative lifetime natural gas savings:	7,131.35 Therms <sup>4</sup>

<sup>1</sup> Quantec, LLC. (2008). *Impact of Flipping the Switch: Evaluating the Effectiveness of Low Income Residential Energy Education Programs*. Portland: Drakos, Jamie et al.

<sup>2</sup> Vickers, Amy (2002). *Water Use and Conservation*. Amherst, MA: WaterPlow Press.

<sup>3</sup> Manufacturer

<sup>4</sup> (October 2007). EPA WaterSense High-Efficiency Lavatory Faucet Specification Supporting Statement

<sup>5</sup> (May 2018). EIA Residential Energy Consumption Survey (RECS). Table HC8.6 Water heating in U.S. homes by climate region, 2015. Retrived July 24, 2018 from <https://www.eia.gov/consumption/residential/data/2015/hc/php/hc8.6.php>

## BATHROOM AERATOR RETROFIT

### Projected Savings

#### Reported Inputs

Average household size:	5.03 people
Retrofit bathroom aerator installation rate:	56%
Participants:	471 students

#### Assumed Inputs

Weighted average daily per capita reduction in water consumption:	0.6 gallons per day <sup>1</sup>
Percent of faucet water used in a household is hot water:	70% <sup>1</sup>
Temperature of incoming cold water:	55° <sup>1</sup>
Temperature of outgoing hot water:	120° <sup>1</sup>
Electric hot water heater efficiency:	90% Efficient <sup>1</sup>
Natural Gas hot water heater efficiency:	60% Efficient <sup>1</sup>
Percent of homes with electric water heat:	59% <sup>2</sup>
Percent of homes with natural gas water heat:	41% <sup>2</sup>
Percent of homes with propane water heat:	2% <sup>2</sup>
Product life:	5 years <sup>3</sup>

#### Outcomes

Projected cumulative annual water savings:	0.89 Acre Feet <sup>1</sup>
Projected cumulative annual electric savings:	21,183.56 kWh <sup>1</sup>
Projected cumulative annual natural gas savings:	753.59 Therms <sup>1</sup>
Projected cumulative lifetime water savings:	4.46 Acre Feet <sup>1</sup>
Projected cumulative lifetime electric savings:	105,917.80 kWh <sup>1</sup>
Projected cumulative lifetime natural gas savings:	3,767.95 Therms <sup>1</sup>

<sup>1</sup> (October 2007). EPA WaterSense High-Efficiency Lavatory Faucet Specification Supporting Statement

<sup>2</sup> (May 2018). EIA Residential Energy Consumption Survey (RECS). Table HC8.6 Water heating in U.S. homes by climate region, 2015. Retrived July 24, 2018 from

<https://www.eia.gov/consumption/residential/data/2015/hc/php/hc8.6.php>

<sup>3</sup> Manufacturer