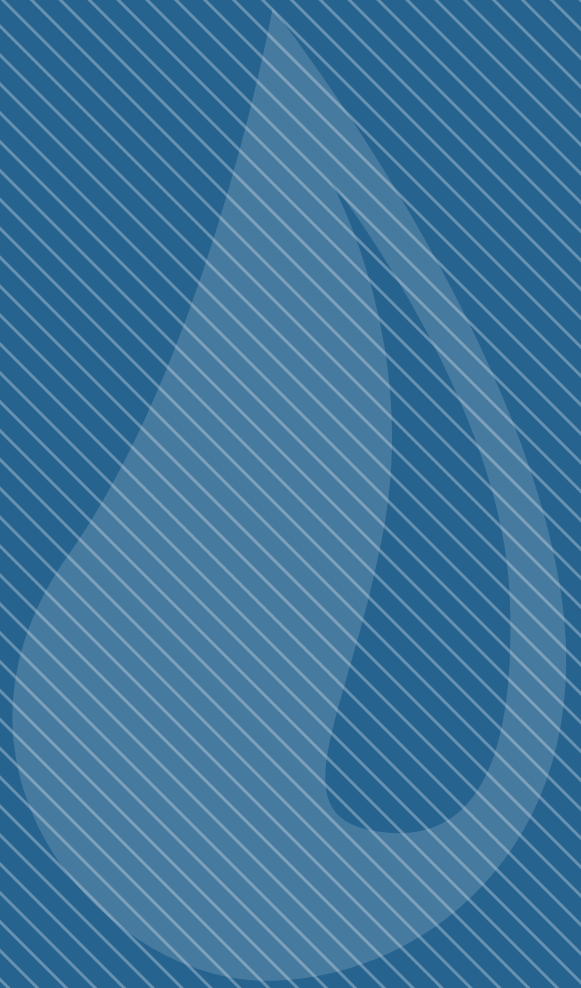
POST OAK SAVANNAH GROUNDWATER CONSERVATION DISTRICT TEXAS WATERWISE™ PROGRAM SUMMARY REPORT

2016-2017



SUBMITTED BY:

RESOURCEACTION PROGRAMS

A FRANKLIN ENERGY COMPANY

Post Oak Savannah Groundwater Conservation District Texas WaterWise™ Program Summary Report 2016-2017

Made possible by:

Submitted by:

RESOURCEACTION PROGRAMS

A FRANKLIN ENERGY COMPANY

July 2017

"The students loved the water kits and being able to use the tools that were given to them at home."

Abigail Garcia, Teacher
Cameron Elementary School

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"As a teacher, the aspect of the program/ materials I liked best was talking to the kids about water conservation and experiencing their enthusiasm"

Jessica Kreusel, Teacher

Caldwell Intermediate School

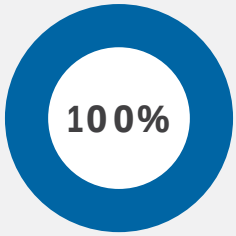
Executive Summary

Resource Action Programs® (RAP) is pleased to present this Program Summary Report to Post Oak Savannah Groundwater Conservation District, which summarizes the 2016-2017 Post Oak Savannah Groundwater Conservation District Texas WaterWise™ Program. The program was implemented in the Post Oak Savannah Groundwater Conservation District service area in the state of Texas by 600 teachers, students, and their families.

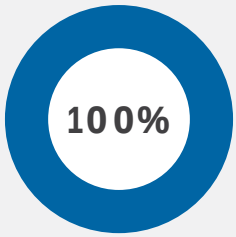
The following pages provide an overview of the program and materials, outline of program implementation, introduction to the program team, description of program enhancements, impact of the program, and summary of results from the home activities. In addition to this information, evaluations, letters, and comments are provided for a glimpse into actual participant feedback. Lastly, projected savings from the individual measures found within the Texas WaterWise Kit are also included.

Participant Satisfaction

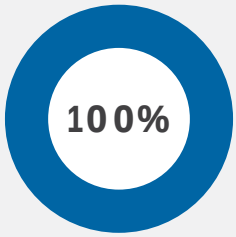
A successful program excites and engages participants. Students, parents, and teachers are asked to evaluate the program and provide personal comments. A sample of the feedback is given in the margin. ›



Teachers who indicated parents supported the program.

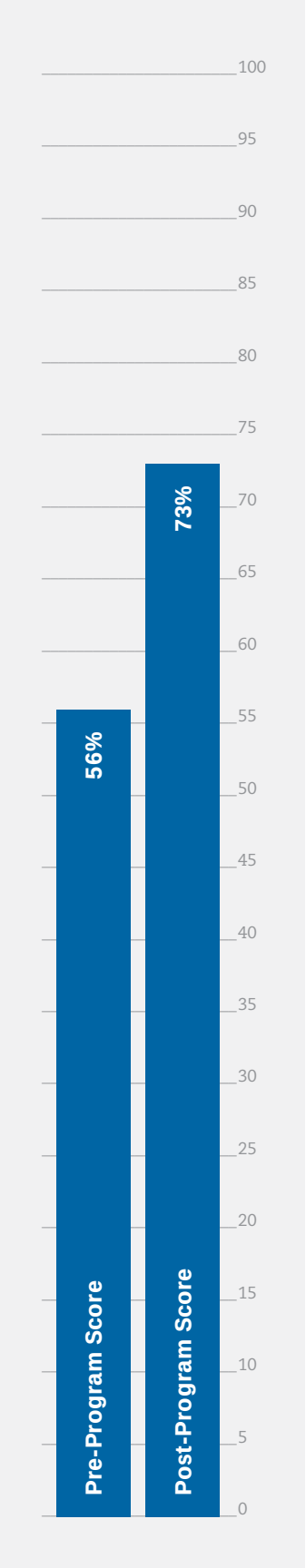


Teachers who indicated they would recommend this program to other colleagues.



Teachers who indicated they would conduct this program again.

A summary of responses can be found in Appendix D.



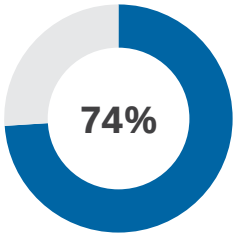
Knowledge Gained

Identical tests were taken by students prior to the program and again upon program completion to measure knowledge gained. Scores and subject knowledge improved from **56%** to **73%**.

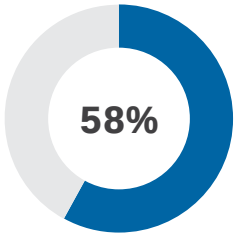
Data Obtained

Home surveys were performed by students and their families, collecting household demographic and consumption data along with program participation information.

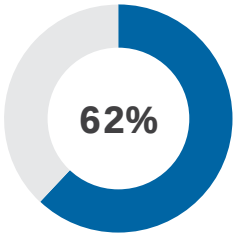
A summary of responses can be found in Appendix B.



Students who reported that their family homes were owned.



Students who reported that their water was heated by electricity.

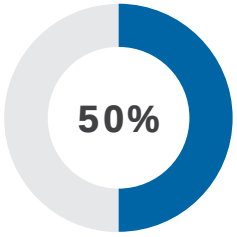


Students who reported that their home has a dishwasher.

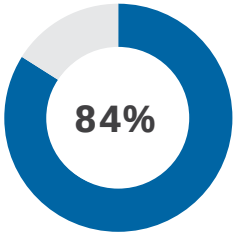
Measures Installed

Students completed retrofit activities as part of the program, and reported the measures they installed in their own homes.

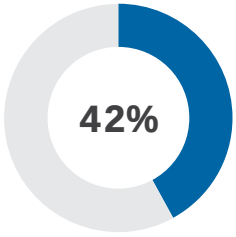
A summary of responses can be found in Appendix B.



Students who reported they installed the High-Efficiency Showerhead.



Students who reported they used the Shower Timer.



Students who reported they installed the Kitchen Faucet Aerator.

Water and Energy Savings Results

In addition to educating students and their parents, a primary program goal is to generate cost-effective water and energy savings. Student home surveys not only provided the data used in the savings projections, but also reinforced the learning benefits.

Projected Resource Savings

A list of assumptions and formulas used for these calculations can be found in Appendix A.

PROJECTED ANNUAL SAVINGS	
4,463,263	gallons of water saved
8,952	therms of gas saved
247,666	kWh of electricity saved
4,463,263	gallons of wastewater saved

PROJECTED LIFETIME SAVINGS	
24,523,724	gallons of water saved
50,807	therms of gas saved
1,407,433	kWh of electricity saved
24,523,724	gallons of wastewater saved

PROJECTED ANNUAL SAVINGS PER HOME	
7,439	gallons of water saved
15	therms of gas saved
413	kWh of electricity saved
7,439	gallons of wastewater saved

PROJECTED LIFETIME SAVINGS PER HOME	
40,873	gallons of water saved
85	therms of gas saved
2,346	kWh of electricity saved
40,873	gallons of wastewater saved

"Participants and their parents/guardians realize actual water and energy savings within their home, bene tting two generations."

Program Overview

The Post Oak Savannah Groundwater Conservation District Texas WaterWise™ Program, a school-based water and energy efficiency education program, is designed to generate immediate and long-term resource savings by bringing interactive, real-world education home to students and their families. The 2016-2017 program was taught in 4th grade throughout the Post Oak Savannah Groundwater Conservation District service area.

The Post Oak Savannah Groundwater Conservation District Texas WaterWise Program team identifies and enrolls students and teachers within the designated service area. The program physically begins with classroom discussions using a Student Guide that provides the foundations of using water and energy efficiently. It is followed by hands-on, creative, problem-solving activities led by the classroom teacher.

All program materials support Texas Essential Knowledge and Skills (TEKS) to allow the program to fit easily into a teacher's existing curriculum and requirements. The participating classroom teachers follow the Teacher Book and lesson plan. Information is given to guide lessons throughout the program in order to satisfy each student's individual needs, whether they are visual, auditory, or kinesthetic learners.

The Texas WaterWise Kit and Student Workbook comprise the take-home portion of the program. Students receive a kit containing high-efficiency measures they use to install within their homes. With the help of their parents/guardians, students install the kit measures and complete a home survey. The act of installing and monitoring new water and energy efficiency devices in their homes allows students to put their learning into practice. Here, participants and their parents/guardians realize actual water and energy savings within their home, benefitting two generations.

A critical element of RAP program design is the use of new knowledge through reporting. At the end of the program, the Post Oak Savannah Groundwater Conservation District program team tabulates all participant responses—including home survey information, teacher responses, student letters, and parent feedback—and generates this Program Summary Report.

"For more than 24 years, Resource Action Programs (RAP) has designed and implemented Measure-Based Education® programs that inspire change in household energy and water use while delivering signi cant, measurable resource savings."

Program Materials

Each participant in the Post Oak Savannah Groundwater Conservation District Texas WaterWise™ Program receives classroom materials and water and energy efficiency kits containing high-efficiency measures to perform the program's take-home activities. Program materials for students, parents/guardians, and teachers are outlined below.

Each Student & Teacher Receives

Student Guide

Student Workbook

Parent Letter/Pledge Form

Student Survey Form

Certificate of Achievement

Texas WaterWise Kit Containing:

- High-Efficiency Showerhead*
- Shower Timer
- Kitchen Faucet Aerator*
- Bathroom Faucet Aerator*
- Mini Tape Measure
- Digital Thermometer*
- Rain/Drip Gauge*
- Flow Rate Test Bag
- Natural Resources Fact Chart
- Toilet Leak Detector Tablets
- Parent/Guardian Program Evaluation

"GetWise" Wristbands

Program Website Access at Getwise.org

Toll-Free HELP Line

Each Teacher/Classroom Receives

Teacher Book

Step-by-Step Program Checklist

Lesson Plans

Teacher Survey Form

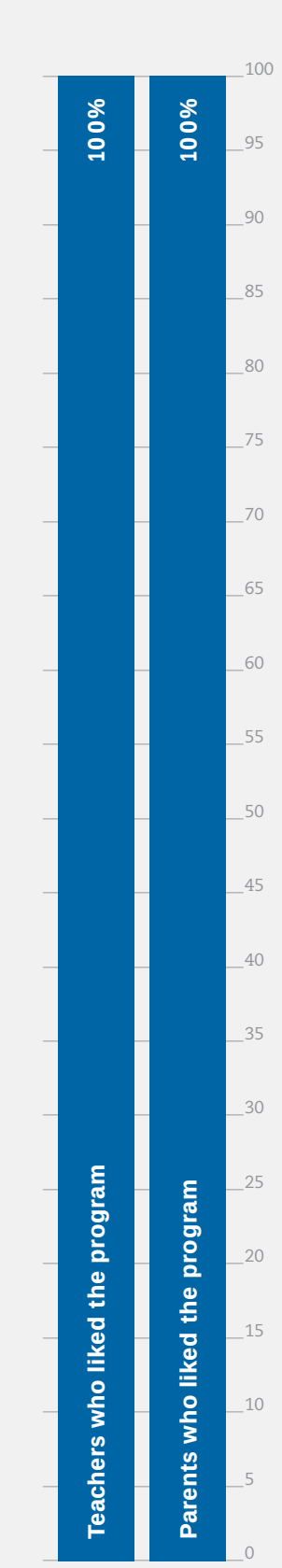
Texas Essential Knowledge and Skills (TEKS) Standards Chart

Pre/Post Test Answer Keys

Texas Water Poster

Self-Addressed Postage-Paid Envelope

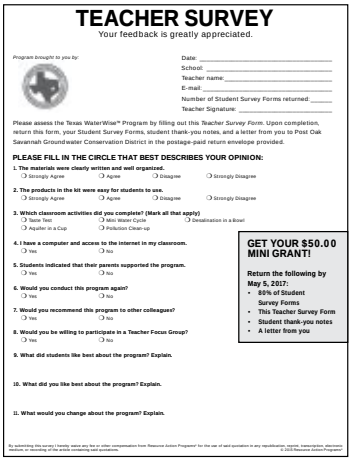
** Materials / Installation Instructions provided in English and Spanish*



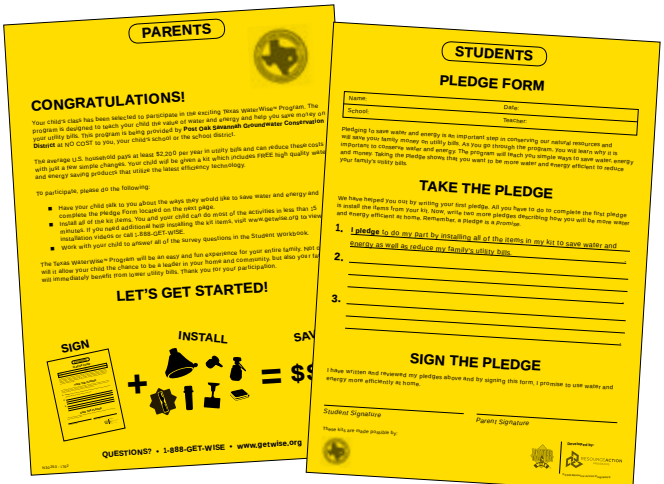
Custom Branding

In addition to increasing resource awareness and efficiency, the program has been designed to strengthen bonds between Post Oak Savannah Groundwater Conservation District and the community. One of the steps taken to ensure the greatest possible exposure is to feature the Post Oak Savannah Groundwater Conservation District logo throughout each Texas WaterWise Kit. In addition to the kit, the Teacher Survey Form and Parent Letter/Pledge Form also feature Post Oak Savannah Groundwater Conservation District branding.

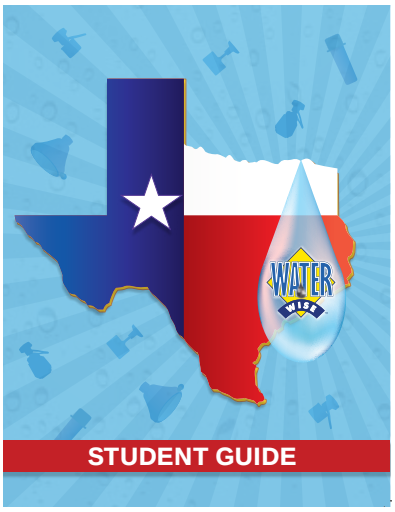
Program Materials



Teacher Survey Form

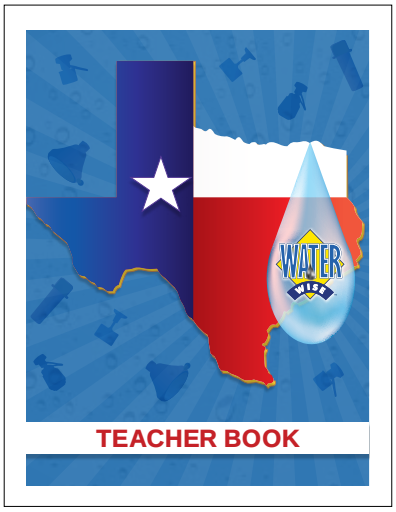


Parent Letter/Pledge Form



Student Guide

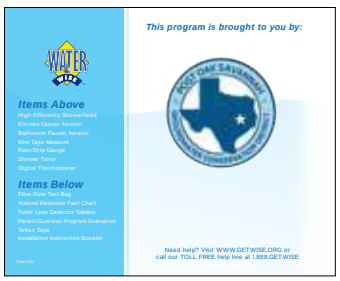
Student Workbook



Teacher Book

Certificate of Achievement

Kit Box



Kit Label

"I enjoyed how engaging and hands-on the program is for both students and myself."

Chelsea Gunn, Teacher
Caldwell Intermediate School

Program Implementation

The 2016-2017 Post Oak Savannah Groundwater Conservation District Texas WaterWise™ Program followed this comprehensive implementation schedule:

1. Identification of Texas Essential Knowledge and Skills (TEKS)
2. Curriculum development and refinement (completed annually)
3. Curriculum correlation to Texas Essential Knowledge and Skills (TEKS)
4. Materials modification to incorporate Post Oak Savannah Groundwater Conservation District branding
5. Incentive program development
6. Teacher/school identification - with Post Oak Savannah Groundwater Conservation District approval
7. Teacher outreach and program introduction
8. Teachers enrolled in the program individually
9. Implementation dates scheduled with teachers
10. Program material delivered to coincide with desired implementation date
11. Delivery confirmation
12. Periodic contact to ensure implementation and teacher satisfaction
13. Program completion incentive offered
14. Results collection
15. Program completion incentive delivered to qualifying teachers
16. Thank you cards sent to participating teachers
17. Data analysis
18. Program Summary Report generated and distributed

Participating teachers are free to implement the program to coincide with their lesson plans and class schedules. Appendix C provides a comprehensive list of classrooms in grade 4 that participated during the 2016-2017 school year.

For more than 24 years, Resource Action Programs (RAP) has designed and implemented Measure-Based Education® programs that inspire change in household energy and water use while delivering significant, measurable resource savings. All RAP programs feature a proven blend of innovative education, comprehensive implementation services, and hands-on activities to put efficiency knowledge to work in students' homes.

RAP has a strong reputation for providing a high level of client service as part of a wide range of energy efficiency education solutions for utilities, municipalities, states, community agencies, corporations, and more. In 2013, RAP was the only conservation services provider honored by the American Council for an Energy-Efficient Economy (ACEEE) and the Alliance for Water Efficiency (AWE) as one of 12 top programs that provides sustained achievement. RAP was honored for market penetration, innovative design, and its ability to achieve substantial/sustained energy and water savings.

ACEEE
American Council for an Energy-Efficient Economy

Alliance for Water Efficiency

Program Team

RAP implements nearly 300 individual programs that serve more than 550,000 households each year. All-inclusive program delivery occurs in its 80,000 square-foot Nevada Program Center where implementation teams and support departments work together to provide:

- 1:1 teacher support
- Curriculum development
- Customized materials
- Data tracking and reporting
- Water and energy efficiency measures
- Graphic and web design
- Kit assembly
- Marketing communications
- Shipping
- Printing
- Program management
- Participant enrollment
- Warehousing

The Implementation Team

For the Post Oak Savannah Groundwater Conservation District Texas WaterWise™ Program, RAP assigned a specific implementation team to Post Oak Savannah Groundwater Conservation District made up of a PMP®-designated Program Manager, CEM®-designated energy analyst, graphic designer, outreach personnel, educator, and administrative staff. This team immersed themselves into the Post Oak Savannah Groundwater Conservation District brand, and handled all program implementation for Post Oak Savannah Groundwater Conservation District. Post Oak Savannah Groundwater Conservation District also received the benefit of fully staffed support departments, which worked with the implementation team to define success for Post Oak Savannah Groundwater Conservation District. These departments include education, marketing, information technology, and warehouse/logistics.

Continuous Improvement

In addition to successful implementation of the Post Oak Savannah Groundwater Conservation District Texas WaterWise Program, RAP engages in continuous program improvement, as well as enhancements to educational materials, with modifications based on emerging technology, industry trends, and EM&V findings.

As part of this plan, RAP utilizes an extensive network of educators for program feedback. This feedback ensures that educational components meet the changing needs of educators, keep information relevant to students, and, in turn, provide increased water and energy literacy amongst program participants.

"Upon completion of the program, participating families are asked to complete a home survey to assess their resource use, verify product installation, provide demographic information, and measure participation rates."

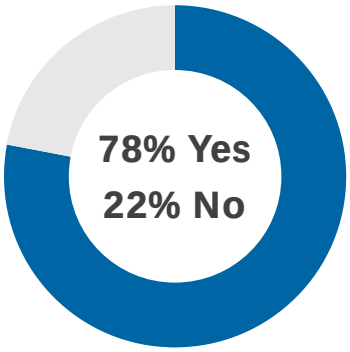
Program Impact

The Post Oak Savannah Groundwater Conservation District Texas WaterWise™ Program has had a significant impact within the community. As illustrated below, the program successfully educated participants about water and energy efficiency while generating resource savings through the installation of efficiency measures in homes. Home survey information was collected to track projected savings and provide household consumption and demographic data. Program evaluations and comments were collected from teachers, students, and parents.

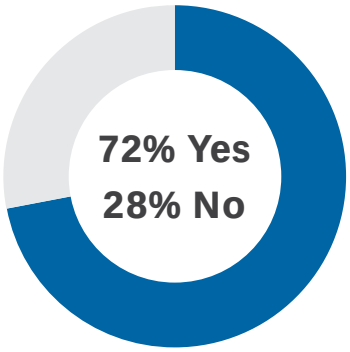
A. Home Survey

Upon completion of the program, participating families are asked to complete a home survey to assess their resource use, verify product installation, provide demographic information, and measure participation rates. A few samples of questions asked are below while a complete summary of all responses is included in the appendices.

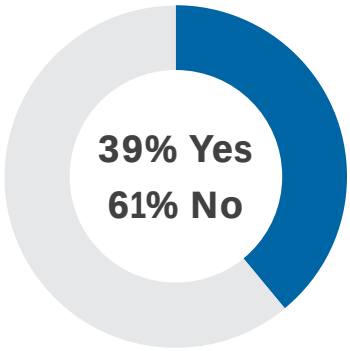
Did you work with your family on this program? **Yes - 78%**
Did your family change the way they use water? **Yes - 72%**
Did your family install the Bathroom Faucet Aerator? **Yes - 39%**



Students who indicated they worked with their family on this program.



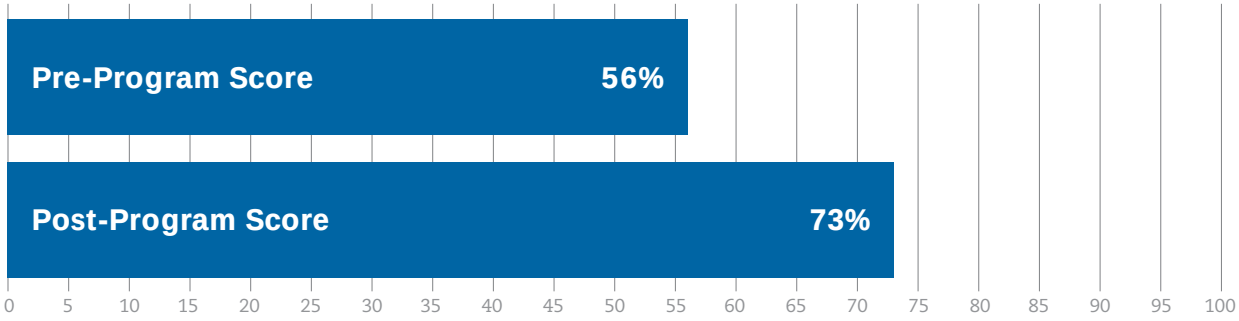
Students who indicated their family changed the way they use water.



Students who indicated they installed the Bathroom Faucet Aerator.

B. Pre-Program and Post-Program Tests

Students were asked to complete a 10-question test before the program was introduced and then again after it was completed to determine the knowledge gained through the program. The average student answered **5.6** of the questions correctly prior to being involved in the program and then improved to answer **7.3** of the questions correctly following participation.



C. Home Activities

As part of the program, parents and students installed resource efficiency measures in their homes. They also measured the pre-existing devices to calculate savings that they generated. Using the family habits collected from the home survey as the basis for this calculation, 600 households are expected to save the following resource totals. Savings from these actions and new behaviors will continue for many years to come.

Projected Resource Savings

A list of assumptions and formulas used for these calculations can be found in Appendix A.

Number of Participants:	**600**		
	Annual	**Lifetime**	
Projected reduction from Showerhead retrofit:	**944,556**	**9,445,559**	gallons
Product Life: **10 years**	**2,588**	**25,877**	therms
	72,360	**723,603**	kWh
Projected reduction from Shower Timer installation:	**838,457**	**1,676,914**	gallons
Product Life: **2 years**	**2,297**	**4,594**	therms
	64,232	**128,465**	kWh
Projected reduction from Kitchen Faucet Aerator retrofit:	**1,030,308**	**5,151,539**	gallons
Product Life: **5 years**	**2,088**	**10,438**	therms
	57,014	**285,068**	kWh
Projected reduction from Bathroom Faucet Aerator retrofit:	**976,924**	**4,884,619**	gallons
Product Life: **5 years**	**1,979**	**9,897**	therms
	54,060	**270,298**	kWh
Projected reduction from the Toilet Leak repair:	**392,025**	**1,960,125**	gallons
Estimated Useful Life (EUL): **5 years**			
Projected reduction from the Faucet Leak repair:	**280,994**	**1,404,968**	gallons
Estimated Useful Life (EUL): **5 years**			
TOTAL PROJECTED PROGRAM SAVINGS:	**4,463,263**	**24,523,724**	gallons
	8,952	**50,807**	therms
	247,666	**1,407,433**	kWh
TOTAL PROJECTED PROGRAM SAVINGS PER HOUSEHOLD:	**7,439**	**40,873**	gallons
	15	**85**	therms
	413	**2,346**	kWh

D. Teacher Program Evaluation

Program improvements are based on participant feedback received. One of the types of feedback obtained is from participating teachers via a Teacher Program Evaluation Form. They are asked to evaluate relevant aspects of the program and each response is reviewed for pertinent information. The following is feedback from the Teacher Program Evaluation for the Post Oak Savannah Groundwater Conservation District Texas WaterWise Program.

Teacher Response

(A summary of responses can be found in Appendix D)

100% of participating teachers indicated they would conduct the program again given the opportunity.

100% of participating teachers indicated they would recommend the program to their colleagues.

What did students like best about the program? Explain.

"*Hands on.*"
Shelly Tucker, Caldwell Intermediate School

"*They liked working with their parents installing things in the house.*"
Jessica Kreusel, Caldwell Intermediate School

"*Activities.*"
Jennifer Skeide, Gause Elementary School

"*The students enjoyed the real-world application and the at home activities that they could complete.*"
Chelsea Gunn, Caldwell Intermediate School

"*The students were very excited to get their kit and go through it.*"
Brett Baxter, Caldwell Intermediate School

What would you change about the program? Explain.

"*Nothing.*"
Shelly Tucker, Caldwell Intermediate School

"*I would not change anything.*"
Chelsea Gunn, Caldwell Intermediate School

"*More worksheets aligned with the workbook lessons.*"
Brett Baxter, Caldwell Intermediate School

"*I like the program the way it is, but at times I think it is a bit much to try and complete.*"
Abigail Garcia, Cameron Elementary School

Teacher Response

(A summary of responses can be found in Appendix D)

What did you like best about the program? Explain.

"Easy to use."
Shelly Tucker, Caldwell Intermediate School

"Talking to the kids about water conservation and experiencing their enthusiasm."
Jessica Kreusel, Caldwell Intermediate School

"All was great."
Jennifer Skeide, Gause Elementary School

"I enjoyed how engaging and hands-on the program is for both students and myself."
Chelsea Gunn, Caldwell Intermediate School

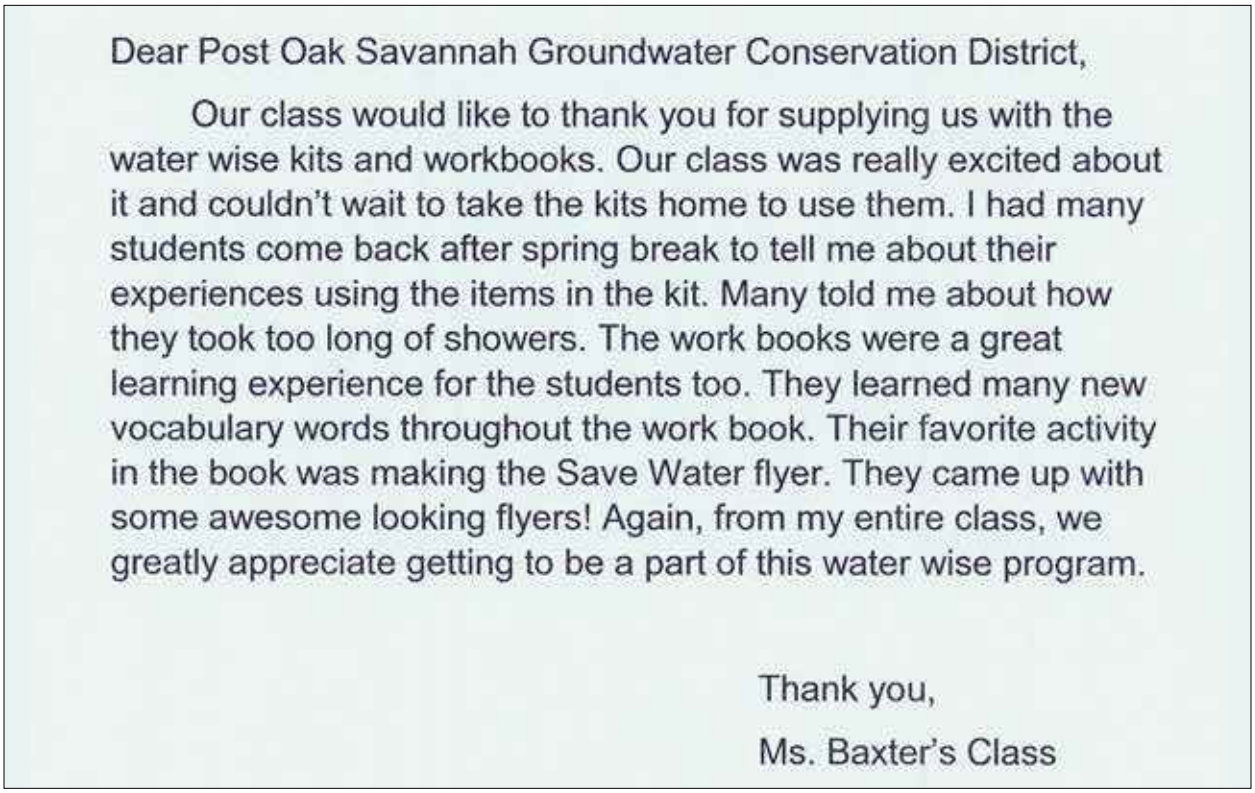
"I like the worksheets that go along with the workbooks."
Brett Baxter, Caldwell Intermediate School

"I like being able to go more into depth with the water cycle. I gave me an opportunity to do more activities with my students for better understanding."
Abigail Garcia, Cameron Elementary School

"The organization of the materials."
Brigid Barton, Cameron Elementary School

E. Teacher Letters

(A summary of responses can be found in Appendix E)

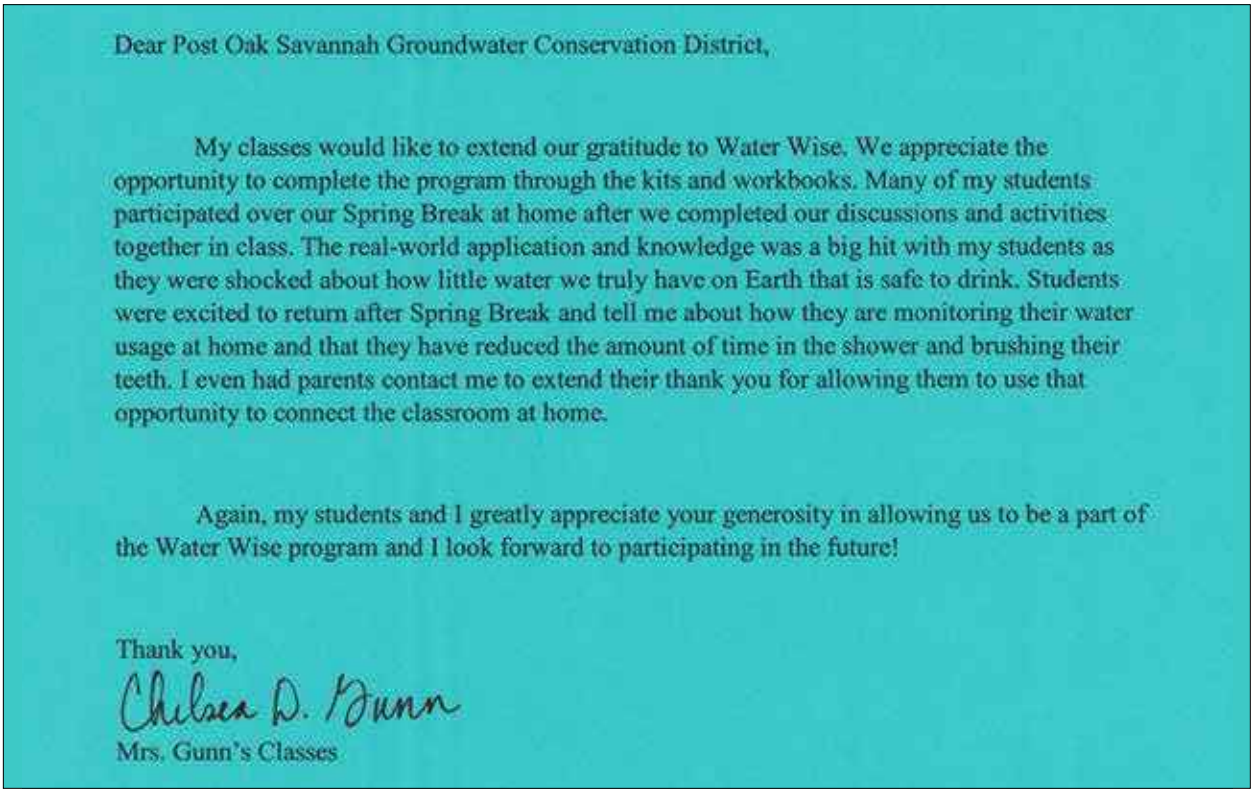


Dear Post Oak Savannah Groundwater Conservation District,

Our class would like to thank you for supplying us with the water wise kits and workbooks. Our class was really excited about it and couldn't wait to take the kits home to use them. I had many students come back after spring break to tell me about their experiences using the items in the kit. Many told me about how they took too long of showers. The work books were a great learning experience for the students too. They learned many new vocabulary words throughout the work book. Their favorite activity in the book was making the Save Water flyer. They came up with some awesome looking flyers! Again, from my entire class, we greatly appreciate getting to be a part of this water wise program.

Thank you,

Ms. Baxter's Class



Dear Post Oak Savannah Groundwater Conservation District,

My classes would like to extend our gratitude to Water Wise. We appreciate the opportunity to complete the program through the kits and workbooks. Many of my students participated over our Spring Break at home after we completed our discussions and activities together in class. The real-world application and knowledge was a big hit with my students as they were shocked about how little water we truly have on Earth that is safe to drink. Students were excited to return after Spring Break and tell me about how they are monitoring their water usage at home and that they have reduced the amount of time in the shower and brushing their teeth. I even had parents contact me to extend their thank you for allowing them to use that opportunity to connect the classroom at home.

Again, my students and I greatly appreciate your generosity in allowing us to be a part of the Water Wise program and I look forward to participating in the future!

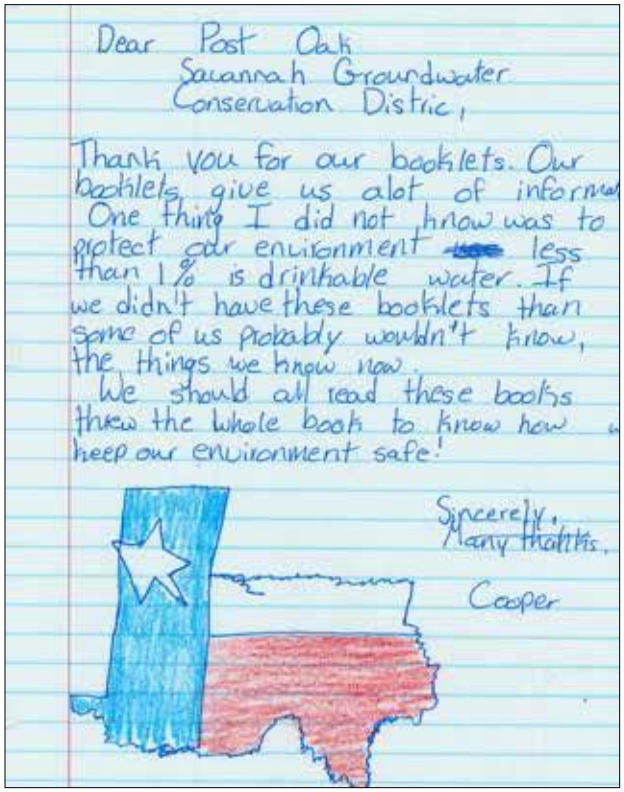
Thank you,

Chelsea D. Gunn

Mrs. Gunn's Classes

F. Student Letters

(A summary of responses can be found in Appendix E)

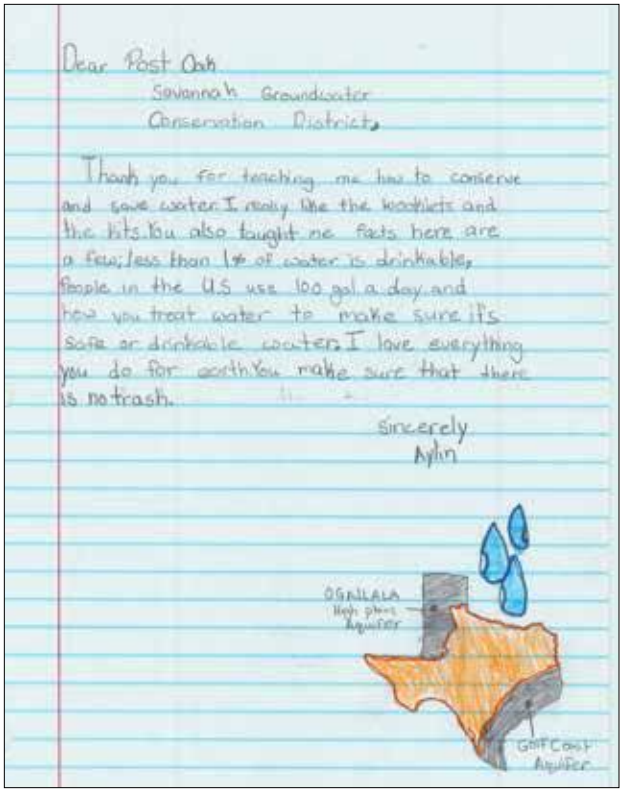


Dear Post Oak
Savannah Groundwater
Conservation Distric,

Thank you for our booklets. Our booklets give us alot of informa
One thing I did not know was to protect our environment less than 1% is drinkable water. If we didn't have these booklets than some of us probably wouldn't know, the things we know now.
We should all read these books threw the whole book to know how to keep our environment safe!

Sincerely,
Many thaNks.

Cooper



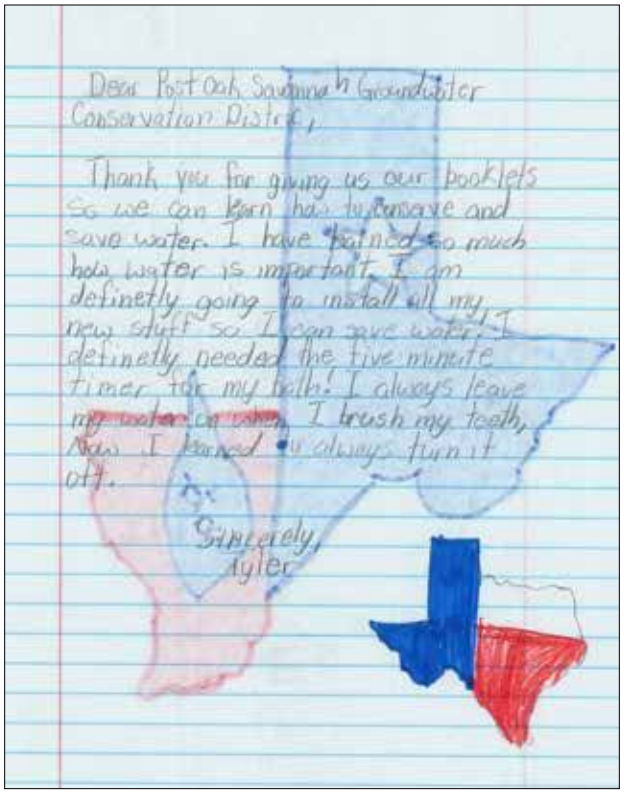
Dear Post Oak
Savannah Groundwater
Conservation District,

Thank you for teaching me how to conserve and save water. I really like the booklets and the kits. You also taught me facts here are a few, less than 1% of water is drinkable, people in the U.S use 100 gal a day and how you treat water to make sure it's safe or drinkable water. I love everything you do for earth. You make sure that there is no trash.

Sincerely
Aylin

OGALLALA High Plains Aquifer

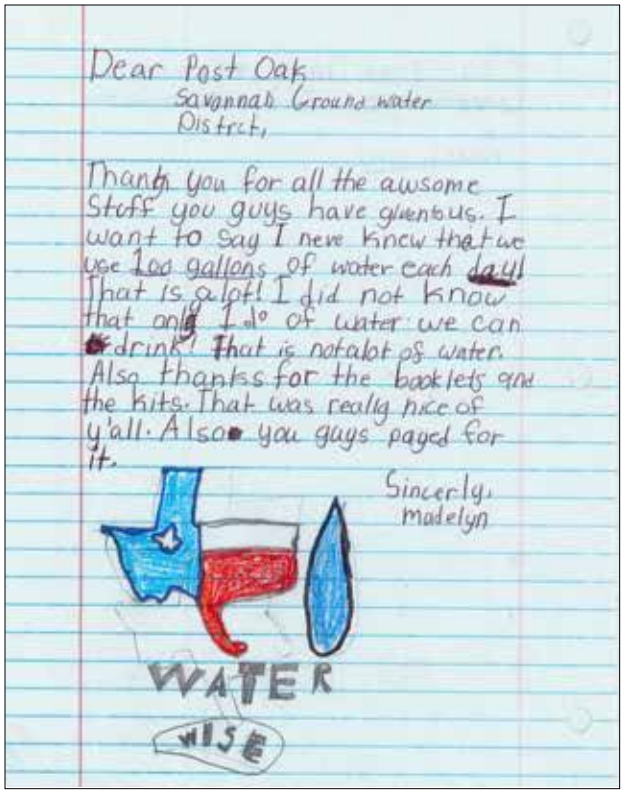
GULF Coast Aquifer



Dear Post Oak Savannah Groundwater
Conservation District,

Thank you for giving us our booklets so we can learn how to conserve and save water. I have learned so much how water is important. I am definetly going to install all my new stuff so I can save water. I definetly needed the five minute timer for my bath! I always leave my water on when I brush my teeth, Now I learned to always turn it off.

Sincerely,
Ayler



Dear Post Oak
Savannah Ground water
District,

Thank you for all the awsome stuff you guys have given us. I want to say I new know that we use 100 gallons of water each day! That is a lot! I did not know that only 1% of water we can drink! That is not a lot of water. Also thanks for the booklets and the kits. That was really nice of y'all. Also you guys payed for it.

Sincerly,
Madelyn

WATER WISE

"I like being able to go more into depth with the water cycle. I gave me an opportunity to do more activities with my students for better understanding."

Abigail Garcia, Teacher

Cameron Elementary School

Appendices

Appendix A

Appendix B

Appendix C

Appendix D

Appendix E

Projected Savings from Showerhead Retrofit

Showerhead retrofit inputs and assumptions:

Average household size:	**5.04**	people[1]
Average number of full bathrooms per home:	**1.79**	full bathrooms per home[1]
% of water heated by gas:	**41.70%**	[1]
% of water heated by electricity:	**58.30%**	[1]
Installation / participation rate of:	**49.57%**	[1]
Average showerhead has a flow rate of:	**1.88**	gallons per minute[1]
Retrofit showerhead has flow rate of:	**1.32**	gallons per minute[1]
Number of participants:	**600**	[1]
Shower duration:	**8.20**	minutes per day[2]
Showers per day per person:	**0.67**	showers per day[2]
Product life:	**10.00**	years[3]

Projected Water Savings:

Showerhead retrofit projects an **annual** reduction of:	**944,556**	gallons[4]
Showerhead retrofit projects a **lifetime** reduction of:	**9,445,559**	gallons[5]

Projected Electricity Savings:

Showerhead retrofit projects an **annual** reduction of:	**72,360**	kWh[2,6]
Showerhead retrofit projects a **lifetime** reduction of:	**723,603**	kWh[2,7]

Projected Natural Gas Savings:

Showerhead retrofit projects an **annual** reduction of:	**2,588**	therms[2,8]
Showerhead retrofit projects a **lifetime** reduction of:	**25,877**	therms[2,9]

1 Data reported by program participants.

2 (March 4, 2010). EPA WaterSense® Specification for Showerheads Supporting Statement. Retrieved from http://www.epa.gov/WaterSense/docs/showerheads_finalsuppstat508.pdf

3 Provided by manufacturer.

4 [(Average Household Size x Shower Duration x Showers per Day per Person) ÷ Average Number of Full Bathrooms per Home] x (Average Showerhead Flow Rate - Retrofit Showerhead Flow Rate) x Number of Participants x Installation Rate x 365 days

5 [(Average Household Size x Shower Duration x Showers per Day per Person) ÷ Average Number of Full Bathrooms per Home] x (Average Showerhead Flow Rate - Retrofit Showerhead Flow Rate) x Number of Participants x Installation Rate x 365 days x Product Life

6 Projected Annual Water Savings x Percent of Water that is Hot Water x 0.18 kWh/gal x % of Water Heated by Electricity

7 Projected Annual Water Savings x Percent of Water that is Hot Water x 0.18 kWh/gal x % of Water Heated by Electricity x Product Life

8 Projected Annual Water Savings x Percent of Water that is Hot Water x 0.009 Therms/gal x % of Water Heated by Natural Gas

9 Projected Annual Water Savings x Percent of Water that is Hot Water x 0.009 Therms/gal x % of Water Heated by Natural Gas x Product Life

Projected Savings from Shower Timer Installation

Shower Timer inputs and assumptions:

% of water heated by gas:	**41.70%**	[1]
% of water heated by electricity:	**58.30%**	[1]
Installation / participation rate of Shower Timer:	**84.03%**	[1]
Average showerhead has a flow rate of:	**2.50**	gallons per minute[1]
Retrofit showerhead has flow rate of:	**1.75**	gallons per minute[1]
Number of participants:	**600**	[1]
Average of baseline and retrofit showerhead flow rate:	**2.13**	gallons per minute[2]
Shower duration:	**8.20**	minutes per day[3]
Shower Timer duration:	**5.00**	minutes per day[4]
Showers per capita per day (SPCD):	**0.67**	showers per day[3]
Percent of water that is hot water:	**73%**	[5]
Days per year:	**365.00**	days
Product life:	**2.00**	years[5]

Projected Water Savings:

Shower Timer installation projects an **annual** reduction of:	**838,457**	gallons[6]
Shower Timer installation projects a **lifetime** reduction of:	**1,676,914**	gallons[7]

Projected Electricity Savings:

Shower Timer installation projects an **annual** reduction of:	**64,232**	kWh[8]
Shower Timer installation projects a **lifetime** reduction of:	**128,465**	kWh[9]

Projected Natural Gas Savings:

Shower Timer installation projects an **annual** reduction of:	**2,297**	therms[10]
Shower Timer installation projects a **lifetime** reduction of:	**4,594**	therms[11]

1 Data Reported by Program Participants.

2 Average of the baseline GPM and the retro t GPM

3 (March 4, 2010). EPA WaterSense® Speci cation for Showerheads Supporting Statement. Retrieved from http://www.epa.gov/WaterSense/docs/showerheads_ nalsuppstat508.pdf

4 Provided by manufacturer.

5 Navigant EM&V Report for Super Savers Program in Illinois PY7

6 Annual water savings = Water Flow (Average of baseline and retro t ow) × (Baseline Shower duration - Shower Timer duration) × Participants × Days per year × SPCD × Installation Rate of Shower Timer

7 Projected Annual Water Savings x Product Life

8 Projected Annual Water Savings x Percent of Water that is Hot Water x 0.18 kWh/gal x % of Water Heated by Electricity x Participants

9 Projected Annual Water Savings x Percent of Water that is Hot Water x 0.18 kWh/gal x % of Water Heated by Electricity x Product Life x Participants

10 Projected Annual Water Savings x Percent of Water that is Hot Water x 0.009 Therms/gal x % of Water Heated by Natural Gas x Participants

11 Projected Annual Water Savings x Percent of Water that is Hot Water x 0.009 Therms/gal x % of Water Heated by Natural Gas x Product Life x Participants

Projected Savings from Bathroom Faucet Aerator Retrofit

Bathroom Faucet Aerator retrofit inputs and assumptions:

Average household size:	**5.04**	people[1]
% of water heated by gas:	**41.70%**	[1]
% of water heated by electricity:	**58.30%**	[1]
Installation / participation rate of:	**39.32%**	[1]
Number of participants:	**600**	[1]
Average bathroom faucet aerator has a flow rate of:	**2.50**	gallons per minute[2]
Retrofit bathroom faucet aerator has flow rate of:	**1.00**	gallons per minute[3]
Product life:	**5.00**	years[3]
Length of use (per family member):	**1.50**	minutes per day[4]

Projected Water Savings:

Bathroom Faucet Aerator retrofit projects an **annual** reduction of:	**976,924**	gallons[5]
Bathroom Faucet Aerator retrofit projects a **lifetime** reduction of:	**4,884,619**	gallons[6]

Projected Electricity Savings:

Bathroom Faucet Aerator retrofit projects an **annual** reduction of:	**54,060**	kWh[4,7]
Bathroom Faucet Aerator retrofit projects a **lifetime** reduction of:	**270,298**	kWh[4,8]
Projected Natural Gas Savings:		
Bathroom Faucet Aerator retrofit projects an **annual** reduction of:	**1,979**	therms[4,9]
Bathroom Faucet Aerator retrofit projects a **lifetime** reduction of:	**9,897**	therms[4,10]

1 Data reported by program participants.

2 Vickers, Amy (2002). Water Use and Conservation. Amherst, MA: WaterPlow Press.

3 Provided by manufacturer.

4 Quantec, LLC. (2008). Impact of Flipping the Switch: Evaluating the Effectiveness of Low Income Residential Energy Education Programs. Portland: Drakos, Jamie et al.

5 [Length of use (each family member) x Average household size] x [Average Bathroom Aerator ow rate – Retro t Bathroom Aerator ow rate] x Number of participants x Installation rate x 365 days

6 [Length of use (each family member) x Average household size] x [Average Bathroom Aerator ow rate – Retro t Bathroom Aerator ow rate] x Number of participants x Installation rate x 365 days x Product Life

7 Projected Annual Water Savings x [(8.33lbs. / gallon x 35°FΔT) ÷ (3413 x water heater ef ciency (0.90)] x % of Water Heated by Electricity

8 Projected Lifetime Water Savings x [(8.33lbs. / gallon x 35°FΔT) ÷ (3413 x water heater ef ciency (0.90)] x % of Water Heated by Electricity

9 Projected Annual Water Savings x [(8.33lbs. / gallon x 35°FΔT) ÷ (100,000 x water heater ef ciency (0.60)] x % of Water Heated by Natural Gas

10 Projected Lifetime Water Savings x [(8.33lbs. / gallon x 35°FΔT) ÷ (100,000 x water heater ef ciency (0.60)] x % of Water Heated by Natural Gas

Projected Savings from Kitchen Faucet Aerator Retrofit

Kitchen Faucet Aerator retrofit inputs and assumptions:

Average household size:	**5.04**	people[1]
% of homes with a dishwasher:	**61.68%**	[1]
% of homes without a dishwasher:	**38.32%**	[1]
% of water heated by gas:	**41.70%**	[1]
% of water heated by electricity:	**58.30%**	[1]
Installation / participation rate of:	**42.44%**	[1]
Number of participants:	**600**	[1]
Average kitchen faucet aerator has a flow rate of:	**2.50**	gallons per minute[2]
Retrofit kitchen faucet aerator has flow rate of:	**1.50**	gallons per minute[3]
Product life:	**5.00**	years[3]
Length of use without dishwasher:	**15.00**	minutes per day[4]
Length of use without dishwasher (each family member):	**1.00**	minute per day[4]
Length of use with dishwasher:	**3.00**	minutes per day[4]
Length of use with dishwasher (each family member):	**0.50**	minutes per day[4]

Projected Water Savings:

Kitchen Faucet Aerator retrofit projects an **annual** reduction of:	**1,030,308**	gallons[5]
Kitchen Faucet Aerator retrofit projects a **lifetime** reduction of:	**5,151,539**	gallons[6]

Projected Electricity Savings:

Kitchen Faucet Aerator retrofit projects an **annual** reduction of:	**57,014**	kWh[4,7]
Kitchen Faucet Aerator retrofit projects a **lifetime** reduction of:	**285,068**	kWh[4,8]

Projected Natural Gas Savings:

Kitchen Faucet Aerator retrofit projects an **annual** reduction of:	**2,088**	therms[4,9]
Kitchen Faucet Aerator retrofit projects a **lifetime** reduction of:	**10,438**	therms[4,10]

1 Data reported by program participants.

2 Vickers, Amy (2002). Water Use and Conservation. Amherst, MA: WaterPlow Press.

3 Provided by manufacturer.

4 Quantec, LLC. (2008). Impact of Flipping the Switch: Evaluating the Effectiveness of Low Income Residential Energy Education Programs. Portland: Drakos, Jamie et al.

5 {Length of use without dishwasher + [Average household size x Length of use without dishwasher (each family member))] x % of homes without dishwasher} + {Length of use with dishwasher + [Average household size x Length of use with dishwasher (each family member))] x % of homes with dishwasher} x [Average Kitchen Aerator ow rate – Retro t Kitchen Aerator ow rate] x Number of participants x Installation rate x 365 days

6 {Length of use without dishwasher + [Average household size x Length of use without dishwasher (each family member))] x % of homes without dishwasher} + {Length of use with dishwasher + [Average household size x Length of use with dishwasher (each family member))] x % of homes with dishwasher} x [Average Kitchen Aerator ow rate – Retro t Kitchen Aerator ow rate] x Number of participants x Installation rate x 365 days x Product Life

7 Projected Annual Water Savings x [(8.33lbs. / gallon x 35°FΔT) ÷ (3413 x water heater ef ciency (0.90)] x % of Water Heated by Electricity

8 Projected Lifetime Water Savings x [(8.33lbs. / gallon x 35°FΔT) ÷ (3413 x water heater ef ciency (0.90)] x % of Water Heated by Electricity

9 Projected Annual Water Savings x [(8.33lbs. / gallon x 35°FΔT) ÷ (100,000 x water heater ef ciency (0.60)] x % of Water Heated by Natural Gas

10 Projected Lifetime Water Savings x [(8.33lbs. / gallon x 35°FΔT) ÷ (100,000 x water heater ef ciency (0.60)] x % of Water Heated by Natural Gas

Projected Savings from Toilet Leak Repair

Toilet Leak repair inputs and assumptions:

Number of participants:	**600**	[1]
% of toilets leaking:	**17.52%**	[1]
% of toilets where the leak was repaired:	**29.55%**	[1]
Number of homes with fixed toilet leaks:	**31.06**	[1]
USGS gallons lost per year per leak:	**12,621.29**	GPY per leak[2]
EUL:	**5**	years[3]

Projected Water Savings:

Toilet Leak repair projects an **annual** reduction of:	**392,025**	gallons/year[4]
Toilet Leak repair projects a **lifetime** reduction of:	**1,960,125**	gallons[5]

1 Data reported by program participants.

2 http://www.epa.gov/WaterSense/pubs/ xleak.html

3 Estimation of years before toilet begins leaking again. Frontier and Associates

4 USGS gallons lost per year per leak x 1 leak per home x Number of homes with xed toilet leaks

5 USGS gallons lost per year per leak x 1 leak per home x Number of homes with xed toilet leaks x Product Life

Projected Savings from Faucet Leak Repair

Faucet Leak repair inputs and assumptions:

Number of participants:	**600**	[1]
Number of faucets leaking:	**61**	[1]
% of all faucets where the leak was repaired:	**22.58%**	[1]
Number of drips per minute:	**1.00**	[2]
Number of drips per day:	**1,440**	[2]
Number of drips per gallon:	**15,140**	[2]
Number of gallons per year:	**34.00**	GPY per leak[2]
EUL:	**5**	years[3]

Projected Water Savings:

Faucet Leak repair projects an **annual** reduction of:	**280,994**	gallons/year[4]
Faucet Leak repair projects a **lifetime** reduction of:	**1,404,968**	gallons[5]

1 Data reported by program participants.

2 http://water.usgs.gov/edu/activity-drip.html

3 Estimation of years before faucet begins leaking again. Frontier and Associates

4 USGS gallons lost per year per leak x 1 leak per home x Number of homes with xed faucet leaks

5 USGS gallons lost per year per leak x 1 leak per home x Number of homes with xed faucet leaks x Product Life

Home Check-Up

1 What type of home do you live in?	
Single family home (mobile)	19%
Single family home (manufactured)	11%
Single family home (built)	56%
Multi-family Home (2-4 units)	6%
Multi-family home (5-20 units)	5%
Multi-family home (21+ units)	2%
2 Was your home built before 1992?	
Yes	53%
No	47%
3 Is your home owned or rented?	
Owned	74%
Rented	26%
4 How many kids live in your home (age 0-17)?	
1	15%
2	32%
3	25%
4	17%
5+	11%
5 How many adults live in your home (age 18+)?	
1	13%
2	62%
3	14%
4	7%
5+	3%
6 Does your home have programmable outdoor sprinkler system?	
Yes	18%
No	82%
7 Does your home have a dishwasher?	
Yes	62%
No	38%
8 How many half-bathrooms are in your home?	
0	79%
1	15%
2	4%
3	1%
4+	1%

Due to rounding of numbers, percentages may not add up to 100%

Home Check-Up

(continued)

9 How many full bathrooms are in your home?

1	35%
2	54%
3	9%
4	1%
5+	1%

10 How many toilets are in your home?

1	25%
2	62%
3	11%
4	3%
5+	0%

11 How is your water heated?

Natural Gas	42%
Electricity	58%

Due to rounding of numbers, percentages may not add up to 100%

Home Activities

1 What is the flow rate of your old showerhead?

0 - 1.0 gpm	15%
1.1 - 1.5 gpm	21%
1.6 - 2.0 gpm	19%
2.1 - 2.5 gpm	25%
2.6 - 3.0 gpm	11%
3.1+ gpm	8%

2 Did your family install the new High-Efficiency Showerhead?

Yes	50%
No	50%

3 If you answered "yes" to question 2, what is the flow rate of your new showerhead?

0 - 1.0 gpm	18%
1.1 - 1.5 gpm	38%
1.6 - 1.75 gpm	44%

4 Did you use the Shower Timer?

Yes	84%
No	16%

5 Did your family install the new Kitchen Faucet Aerator?

Yes	42%
No	58%

6 Did your family install the new Bathroom Faucet Aerator?

Yes	39%
No	61%

7 Did your family lower your water heater settings?

Yes	29%
No	71%

8 Was your toilet leaking?

Yes	18%
No	82%

9 If you answered "yes" to question 8, was the toilet leak repaired?

Yes	30%
No	70%

Due to rounding of numbers, percentages may not add up to 100%

Home Activities

(continued)

10 How many faucets are leaking?

0	84%
1	10%
2	3%
3	1%
4	0%
5+	1%

11 If you answered that there were faucets leaking in question 10, were the faucet leaks repaired?

Yes, all of them	23%
Yes, some of them	7%
None	70%

12 Did your family adjust the outdoor watering schedule?

Yes	30%
No	70%

13 Did you work with your family on this program?

Yes	78%
No	22%

14 Did your family change the way they use water?

Yes	72%
No	28%

15 How would you rate the WaterWise™ Program?

Great	52%
Pretty good	27%
Okay	16%
Not so good	5%

Due to rounding of numbers, percentages may not add up to 100%

Participant List

SCHOOL	TEACHER	T	S
Buckholts School	Jodi Fowler	1	12
Caldwell Intermediate School	Shelly Tucker	1	44
Caldwell Intermediate School	Jessica Kreusel	1	22
Caldwell Intermediate School	Brett Baxter	1	44
Caldwell Intermediate School	Chelsea Gunn	1	44
Cameron Elementary School	Shelly Akin	1	41
Cameron Elementary School	Madison Knutson	1	38
Cameron Elementary School	Abigail Garcia	1	20
Cameron Elementary School	Brigid Barton	1	39
Gause Elementary School	Jennifer Skeide	1	22
Milano Elementary School	D'Nita Broussard	1	30
Rockdale Intermediate School	Abby Jones	1	23
Rockdale Intermediate School	Emily Niemtschk	1	23
Rockdale Intermediate School	Jeana Knapp	1	23
Rockdale Intermediate School	Jennifer Gibbs	1	23
Rockdale Intermediate School	Karen Muston	1	23
Snook Elementary School	Heather Warncke	1	38
Somerville Elementary School	Sally Rost	1	15
Somerville Elementary School	Lori Eilers	1	15
Thorndale Elementary School	Cheryl Brian	1	41
	TOTALS	**20**	**580**
	TOTAL PARTICIPANTS	**600**	

Note: "T" represents number of teachers and "S" represents number of students

Teacher Program Evaluation Data

1 The materials were clearly written and well organized.

Strongly Agree	71%
Agree	29%
Disagree	0%
Strongly Disagree	0%

2 The products in the Kit were easy for students to use.

Strongly Agree	43%
Agree	57%
Disagree	0%
Strongly Disagree	0%

3 I have access to the internet in my classroom.

Yes	100%
No	0%

4 Students indicated that their parents supported the program.

Yes	100%
No	0%

5 Would you conduct this program again?

Yes	100%
No	0%

6 Would you recommend this program to other colleagues?

Yes	100%
No	0%

Due to rounding of numbers, percentages may not add up to 100%

Teacher Comment Data

(continued from page 22)

What did students like best about the program? Explain.

"*They loved the water kits and being able to use the tools that were given to them at home.*"
Abigail Garcia, Cameron Elementary School

"*The activities in the workbook & the take home kit.*"
Brigid Barton, Cameron Elementary School

What would you change about the program? Explain.

"*Nothing.*"
Jennifer Skeide, Gause Elementary School

"*I would not change anything.*"
Chelsea Gunn, Caldwell Intermediate School

"*More worksheets aligned with the workbook lessons.*"
Brett Baxter, Caldwell Intermediate School

"*I like the program the way it is, but at times I think it is a bit much to try and complete.*"
Abigail Garcia, Cameron Elementary School

Teacher Letters

(continued from page 24)

Thanks for supporting such a wonderful program for our students. I am always looking for things that bring a new perspective to the subject matter. This activity does a great job of bringing the family into the learning process! I think that water conservation is a very important topic and this program covers the information well.

Thanks

Stucker

Caldwell ISD

Caldwell Intermediate

Dear Cassandra Friend:

Thank you for helping us participate in the Texas Waterwise Program. I know we were a little behind the curve timewise on getting the program started and implemented but the students really enjoyed it, seemed to learn a lot, and the level of participation was proof that this was a critical age in which to present this material. All of the materials were on an age appropriate level, differentiation for my special needs students was very easy and all students were enthusiastic during the readings and activities. I received several compliments from parents as well.

It was incredibly supportive of you to assist me in getting my fifth graders approved as participants. I understand that your program is designed for fourth grade but for my students that were skipped over last year, it meant a lot to be included in this.

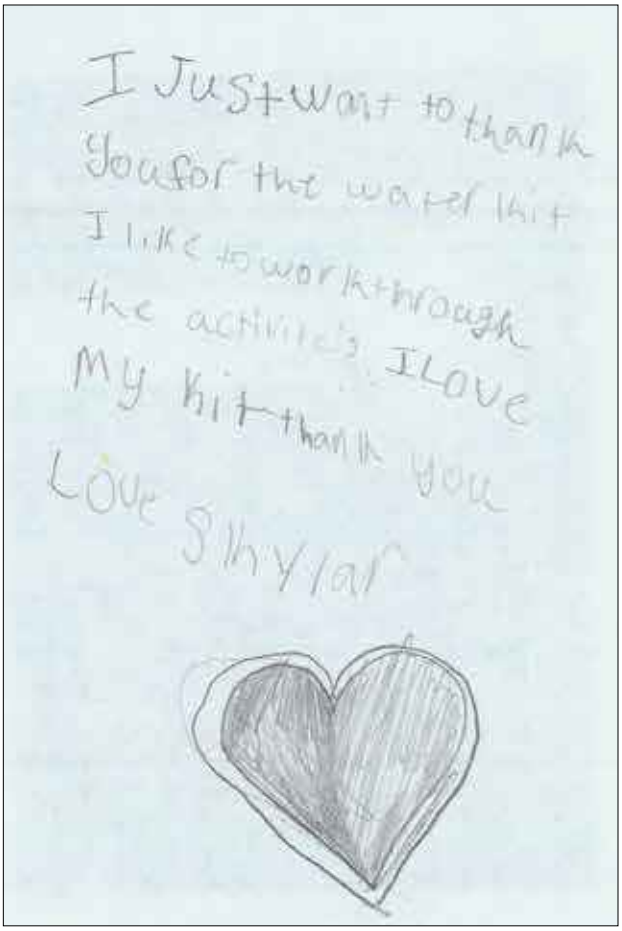
Sincerely,

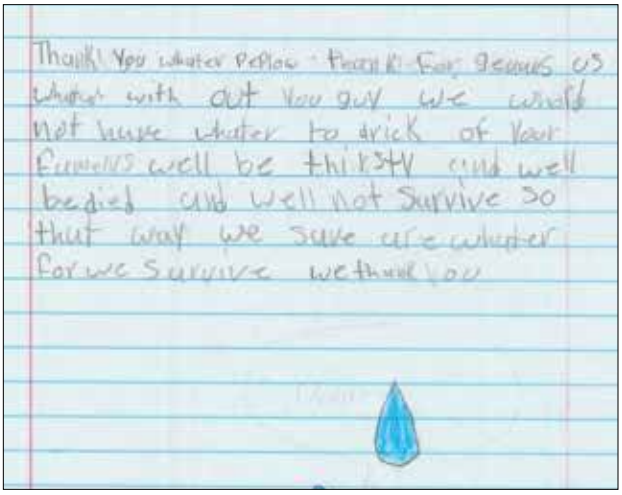
Brigid Barton
4th and 5th Grade Math/Science Educator
Cameron Elementary School

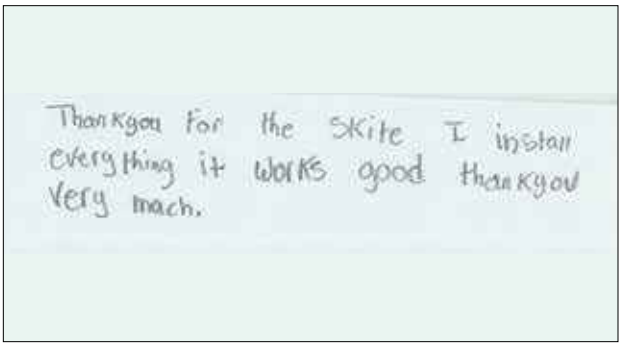
Due to rounding of numbers, percentages may not add up to 100%

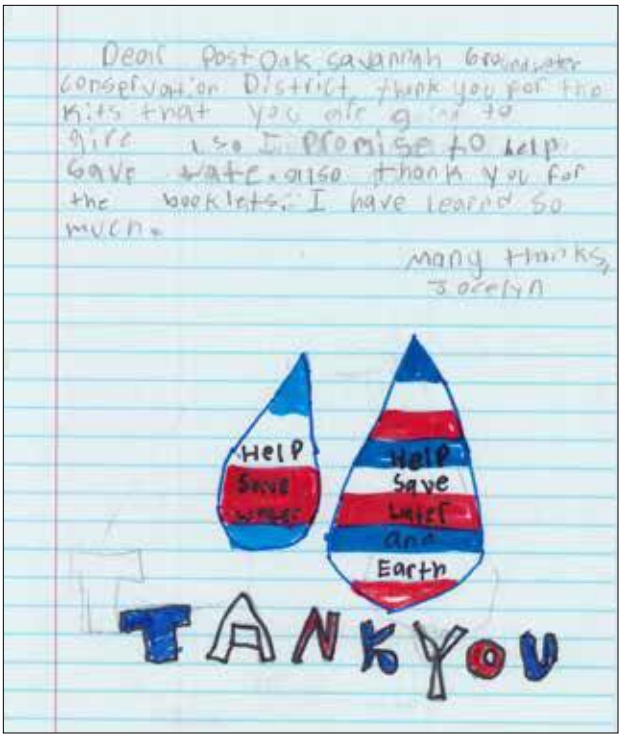
Student Letters

(continued from page 25)



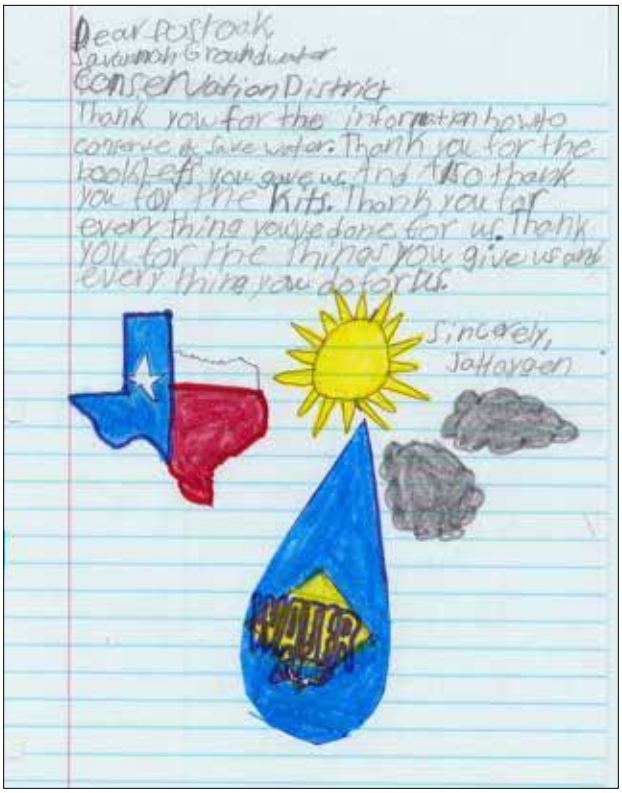


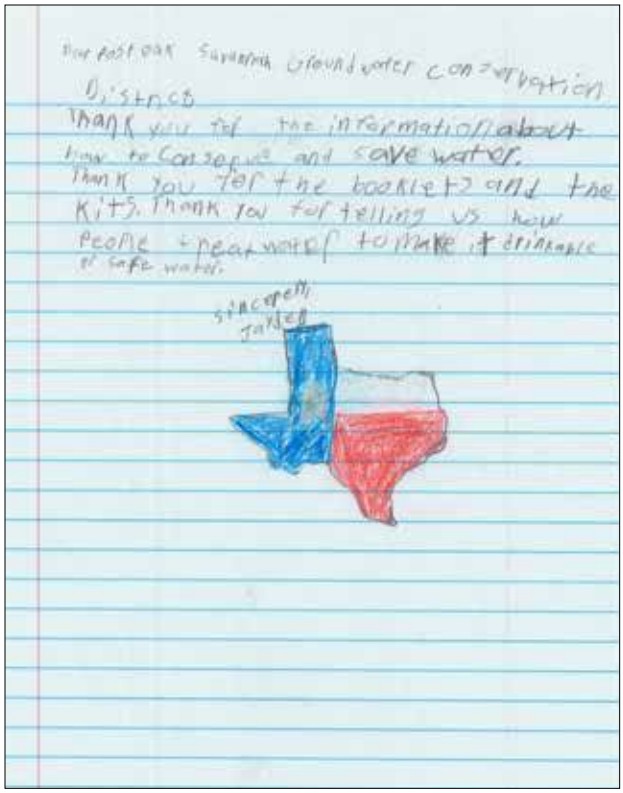


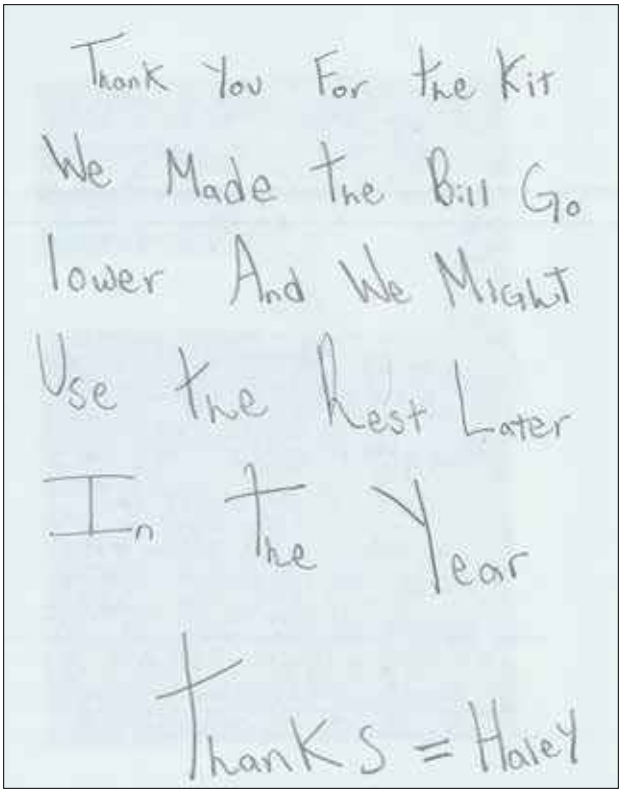


Student Letters

(continued)

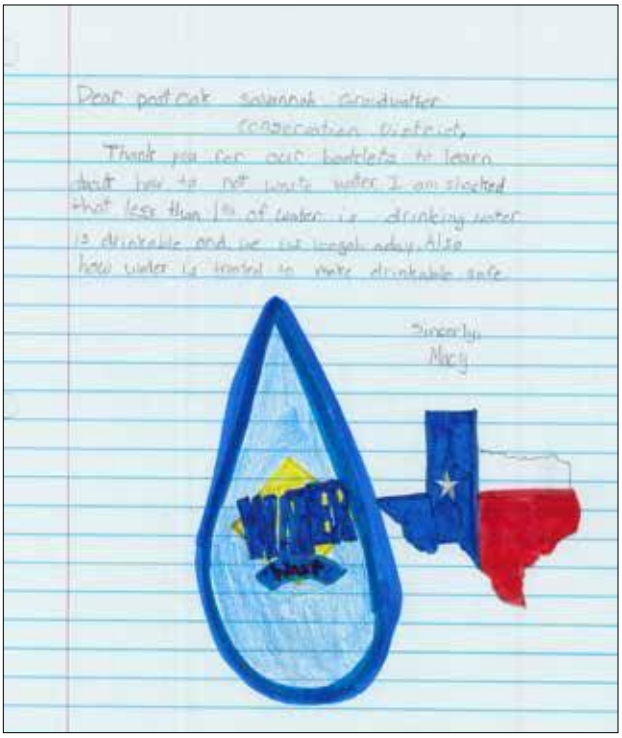


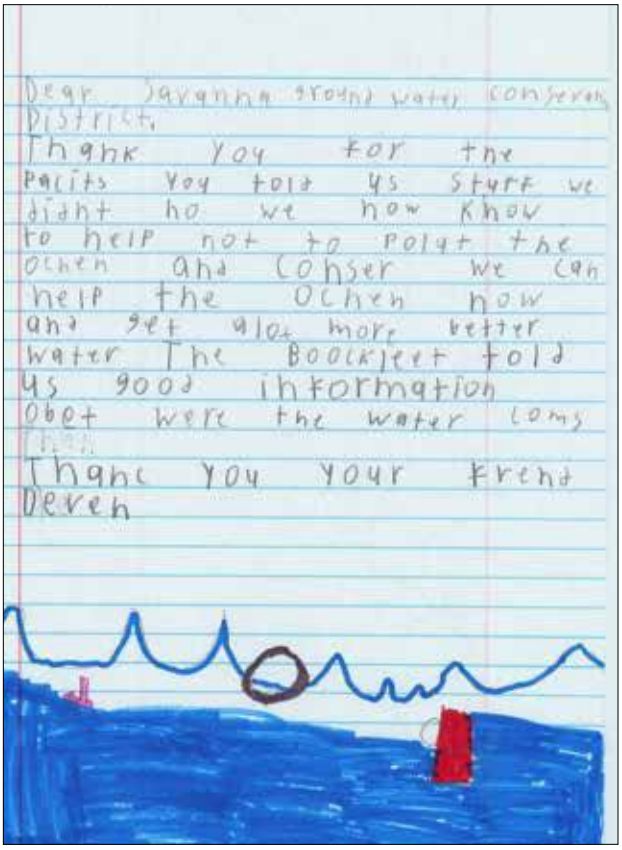


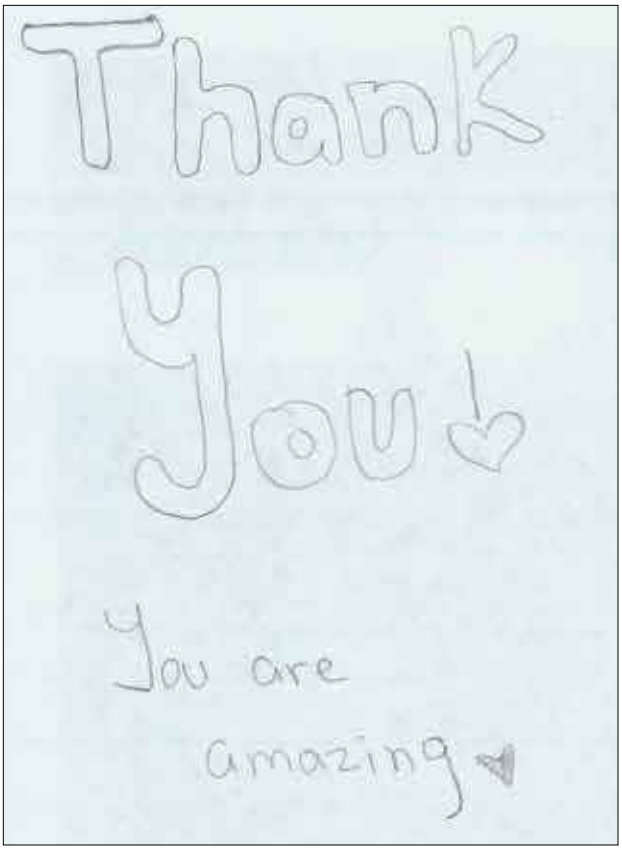


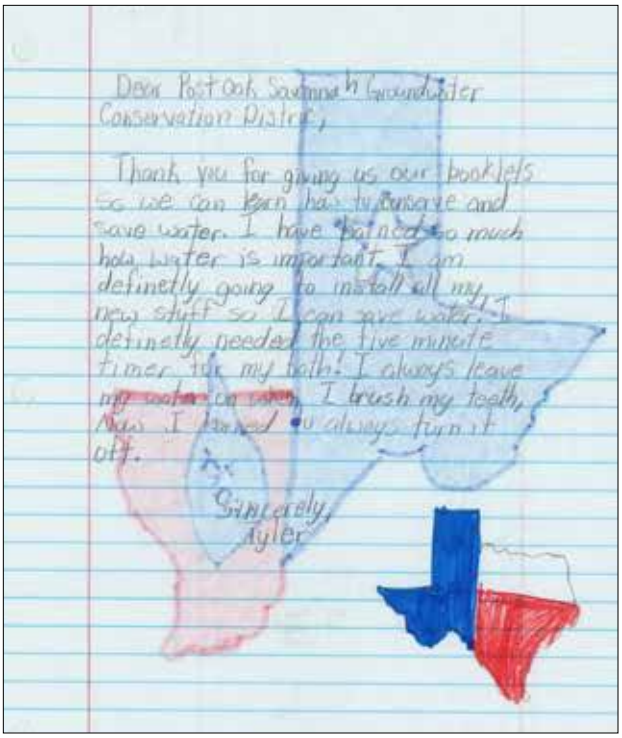
Student Letters

(continued)









Student Letters

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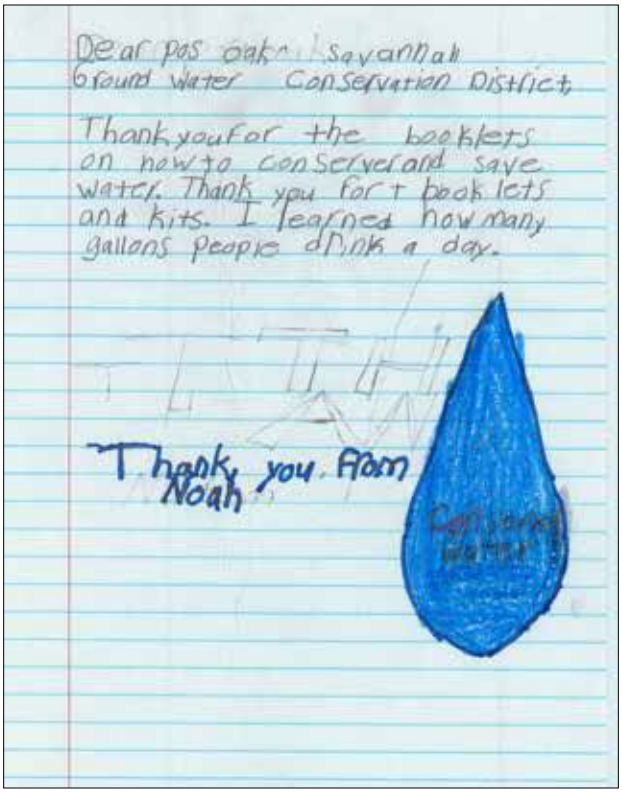

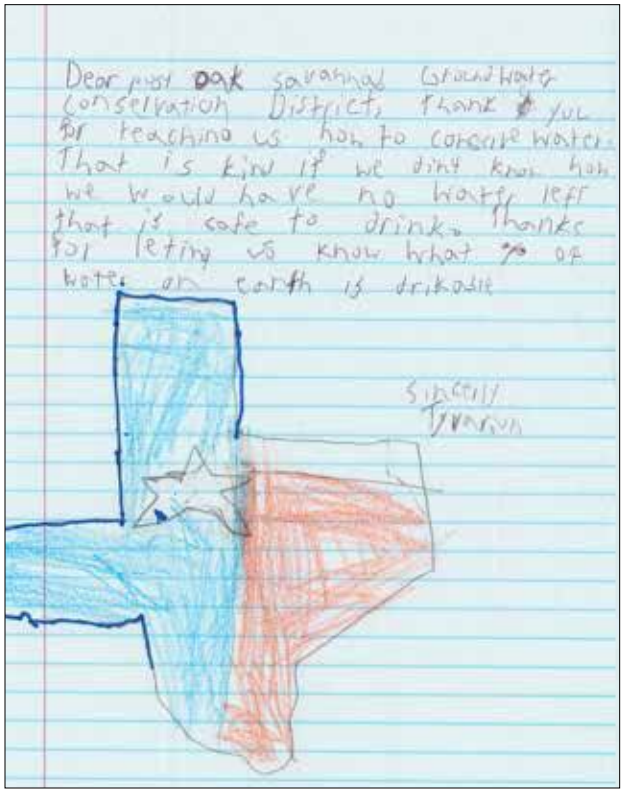

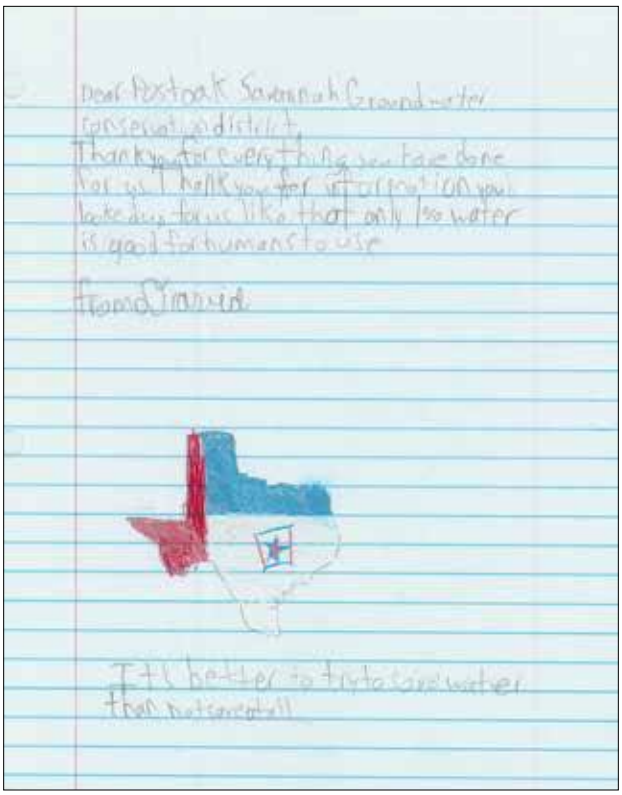

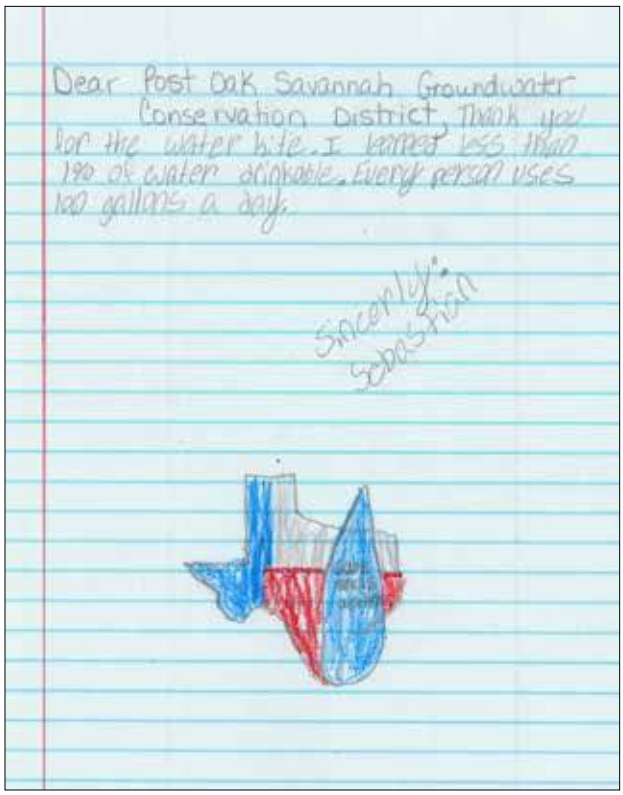

Student Letters

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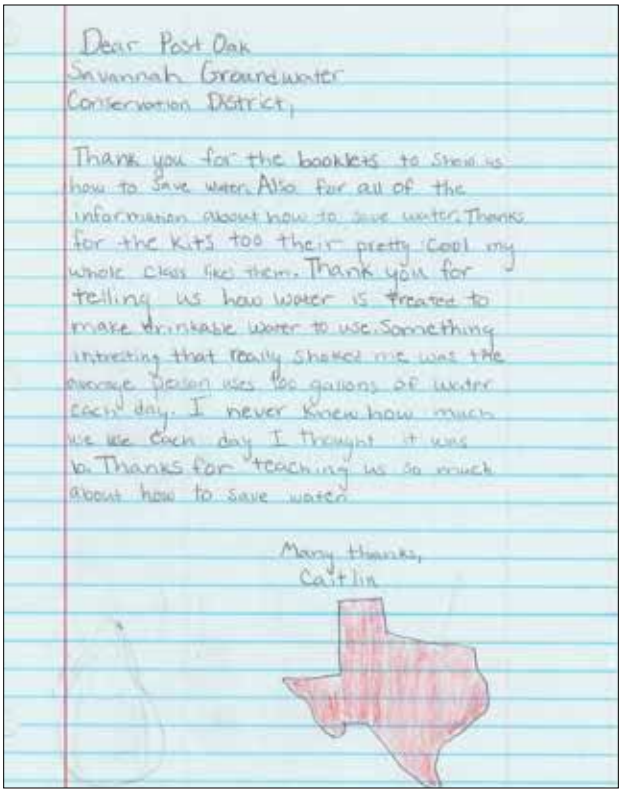
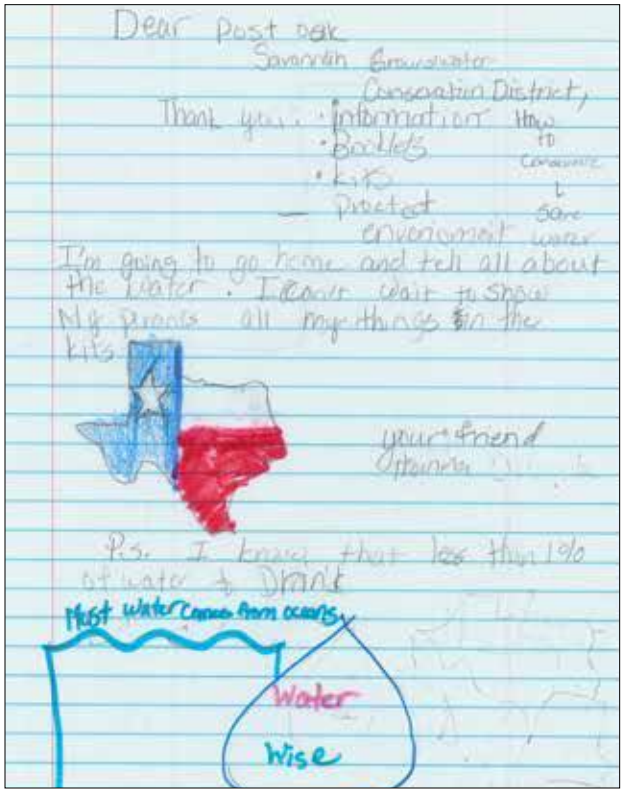


Dear Post Oak
Savannah Groundwater
Conservation District,

Thank you for the booklets to show us how to save water. Also for all of the information about how to save water. Thanks for the kits too they're pretty cool my whole class like them. Thank you for telling us how water is treated to make drinkable water to use. Something interesting that really shocked me was the average person uses 100 gallons of water each day. I never knew how much we use each day I thought it was 10. Thanks for teaching us so much about how to save water.

Many thanks,
Caitlin



Dear Post Oak
Savannah Groundwater
Conservation District,

Thank you for information how to
• Bottles
• kits
— protect environment water

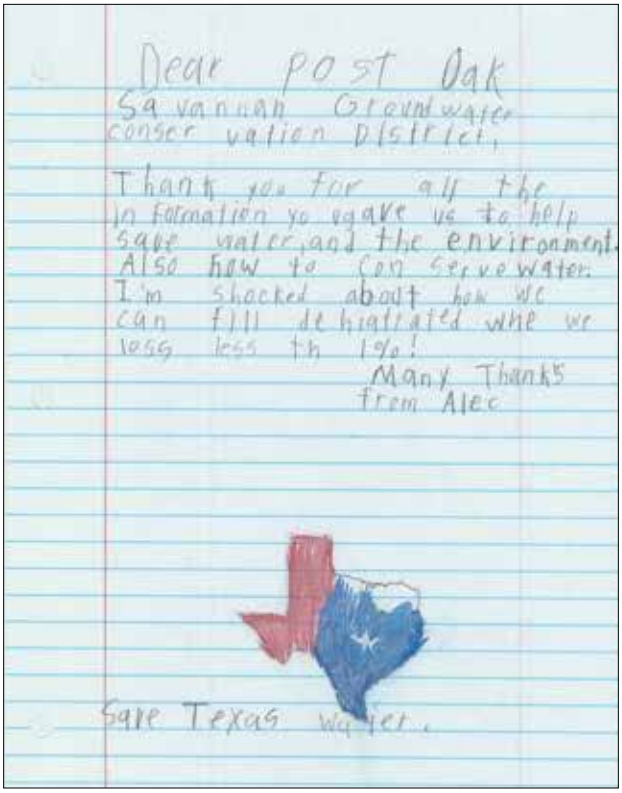
I'm going to go home and tell all about the water. I can't wait to show My parents all my things in the kits.

your friend

P.S. I know that less than 1% of water is drink

Most water comes from oceans

Water
Wise

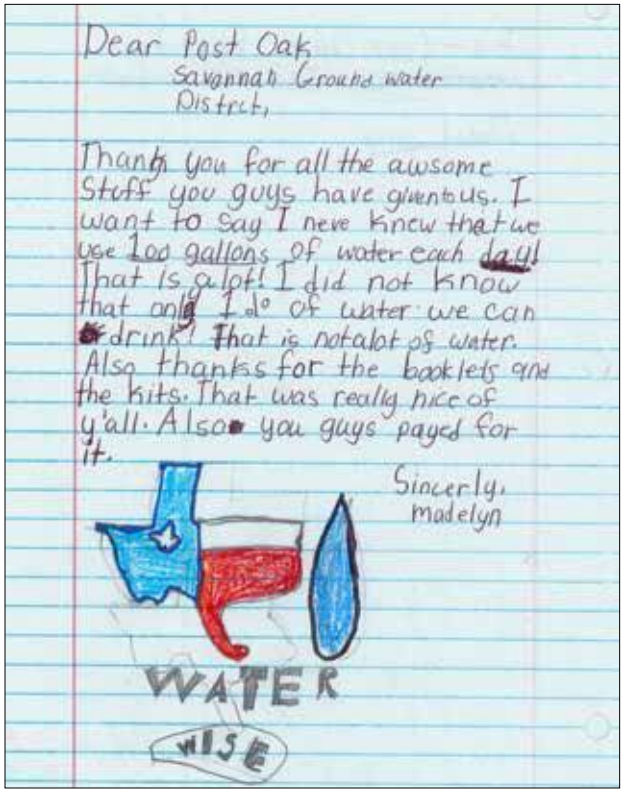


Dear Post Oak
Savannah Groundwater
conservation District,

Thank you for all the information yo gave us to help save water, and the environment. Also how to con serve water. I'm shocked about how we can fill de hidrated whe we loss less th 1%!

Many Thanks
from Alec

Save Texas Water.



Dear Post Oak
Savannah Ground water
District,

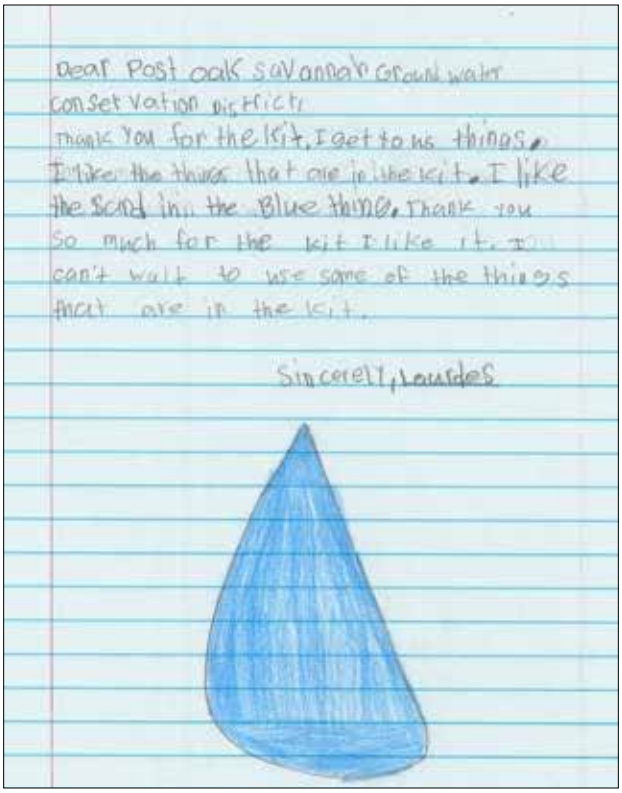
Thank you for all the awsome stuff you guys have given us. I want to say I neve know that we use 100 gallons of water each day! That is a lot! I did not know that only 1% of water we can drink! That is not a lot of water. Also thanks for the booklets and the kits. That was really nice of y'all. Also you guys payed for it.

Sincerly,
madelyn

WATER
WISE

Student Letters

(continued)


Dear Post oak savannah Ground water conset vation district
Thank you for the kit. I get to ns things. I like the three that are in the kit. I like the Sand in the Blue thing. Thank you so much for the kit I like it. I can't wait to use some of the things that are in the kit.

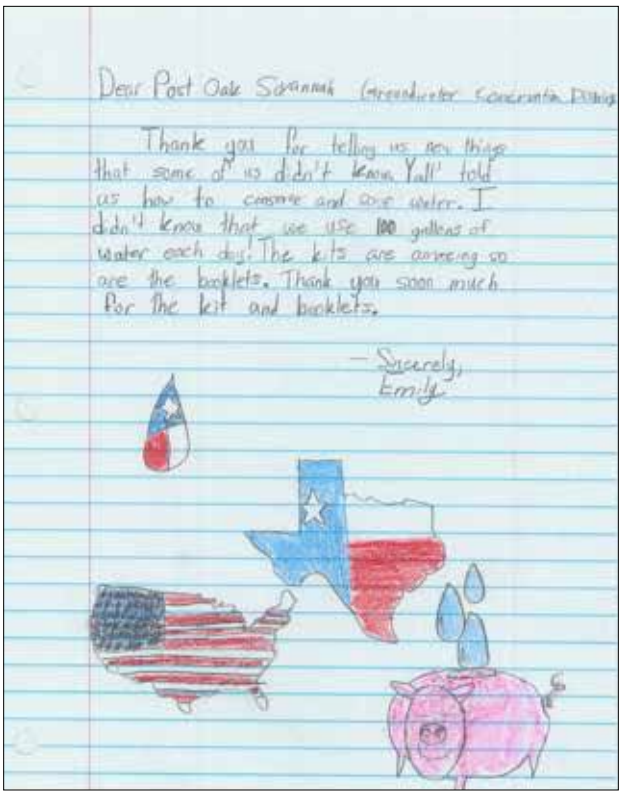
Sincerely, Lourdes


Dear Post oak savannah Groundwater conservation District

Thank you for information how to conserve and save water and for the kits to help save water and to protect the environment some fact I learned is that less than 1% is drinkable all we use 100 gallons a day. Do not water on hot or rainy days or cold days.

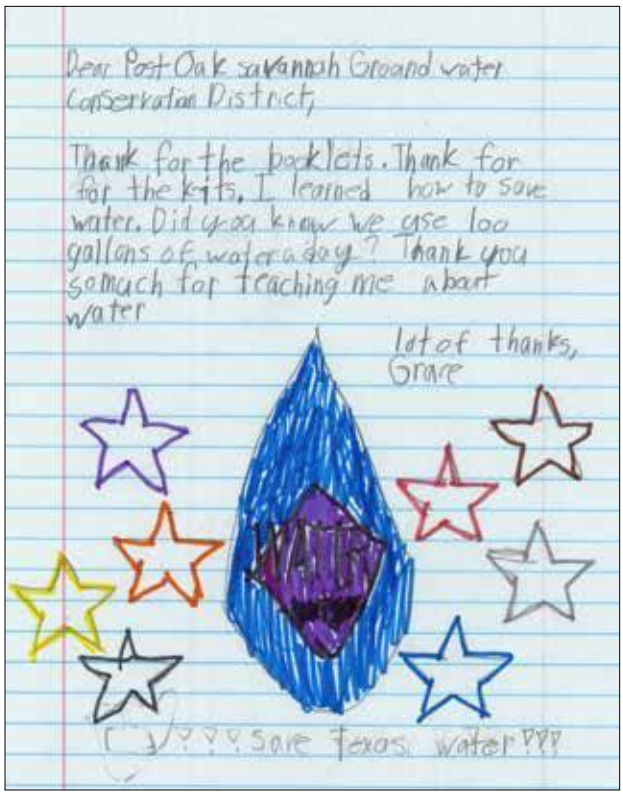
Sincerely,
Aiden

THANK you


Dear Post Oak Savannah Groundwater Conservation District

Thank you for telling us new things that some of us didn't know. Y'all told us how to conserve and save water. I didn't know that we use 100 gallons of water each day. The kits are amazing so are the booklets. Thank you soooo much for the kit and booklets.

Sincerely,
Emily


Dear Post Oak savannah Groand water Conservation District

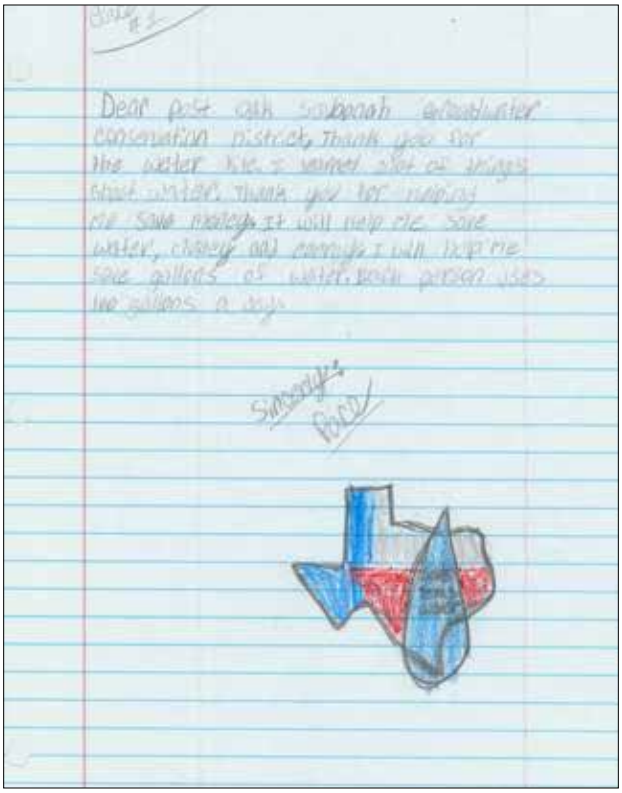
Thank for the booklets. Thank for for the kits. I learned how to save water. Did you know we use 100 gallons of water a day? Thank you somuch for teaching me about water

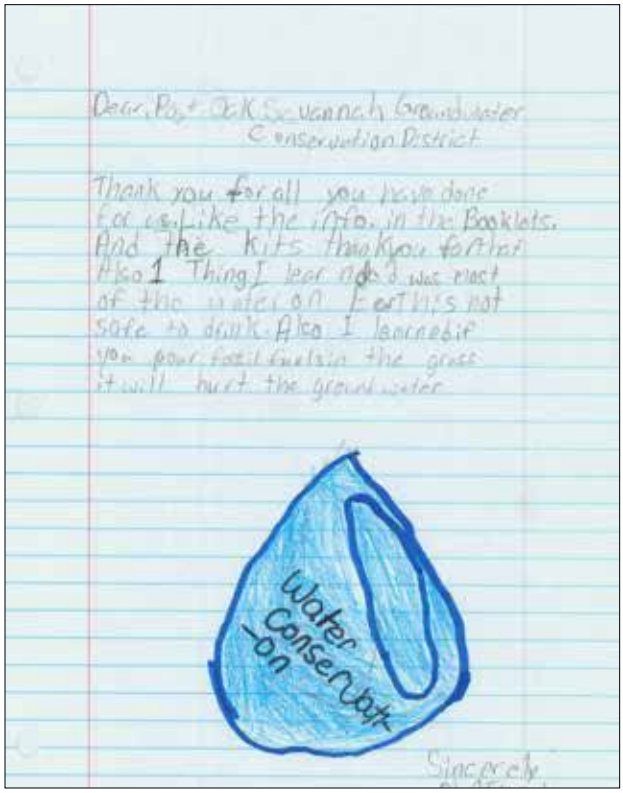
lot of thanks,
Grace

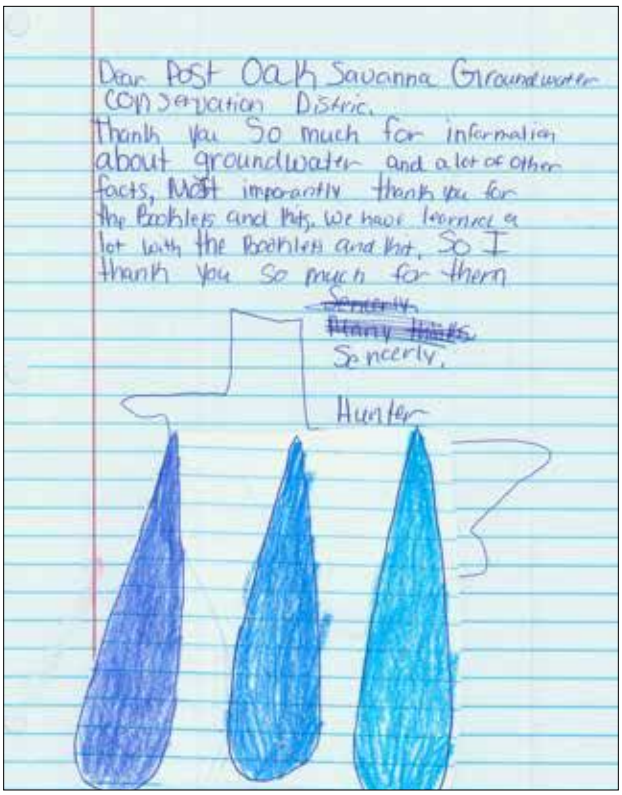
Save Texas water!!!

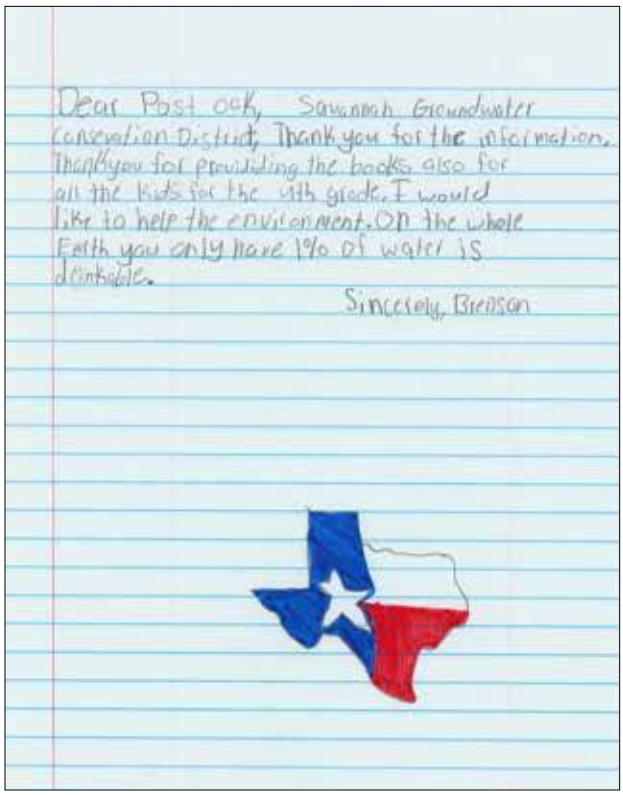
Student Letters

(continued)









Student Letters

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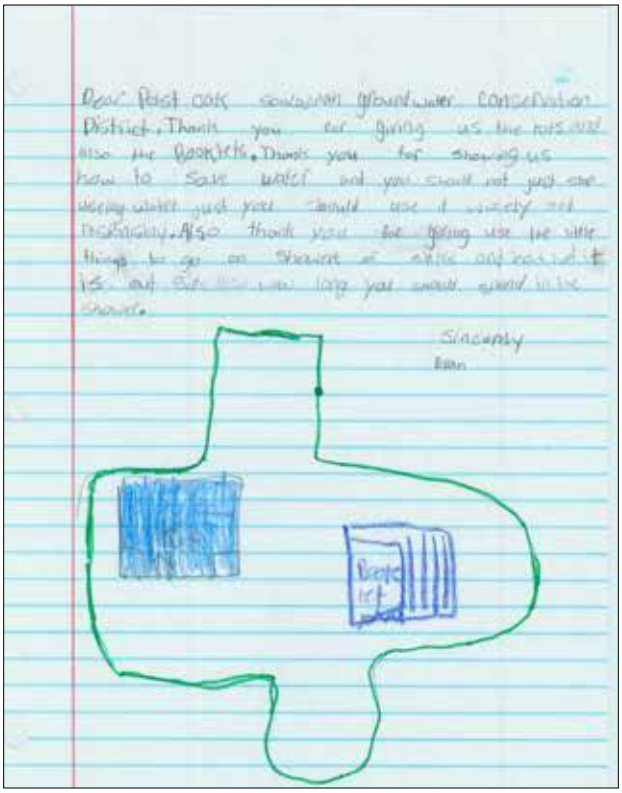

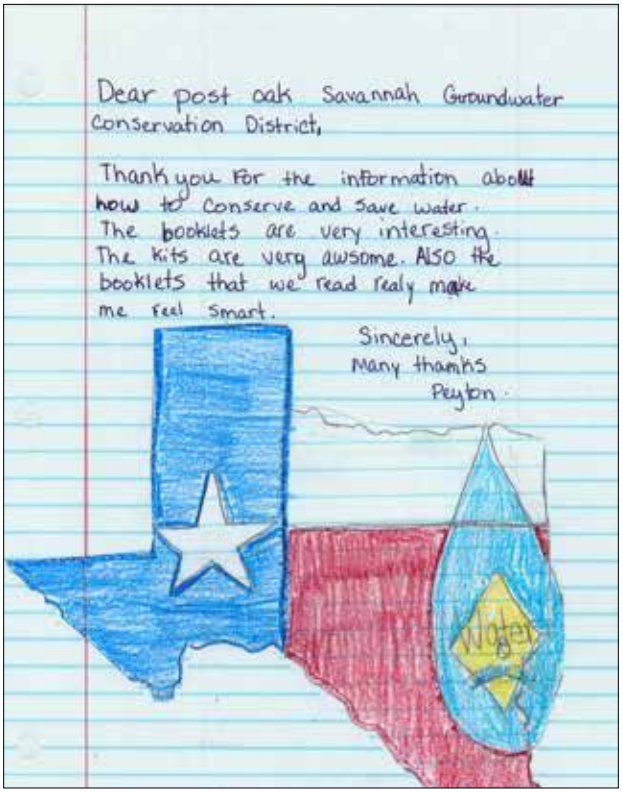

Student Letters

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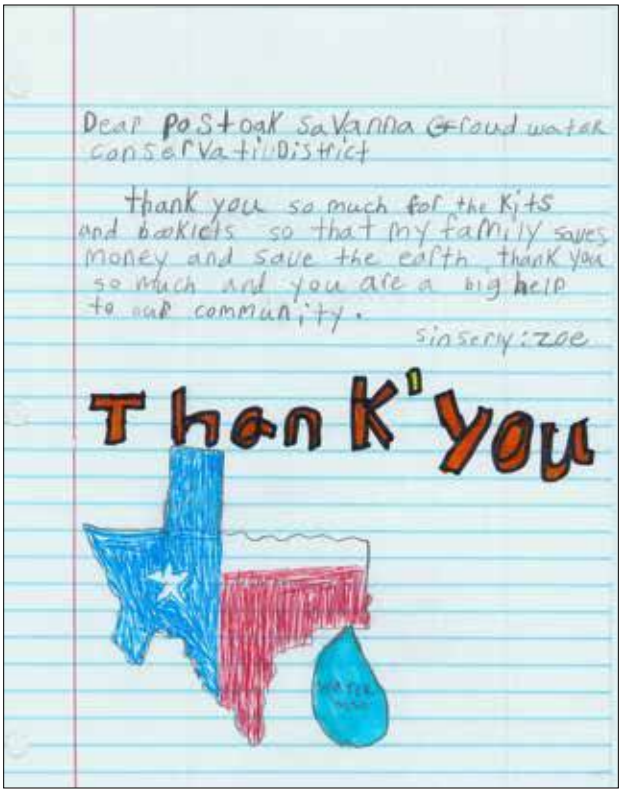

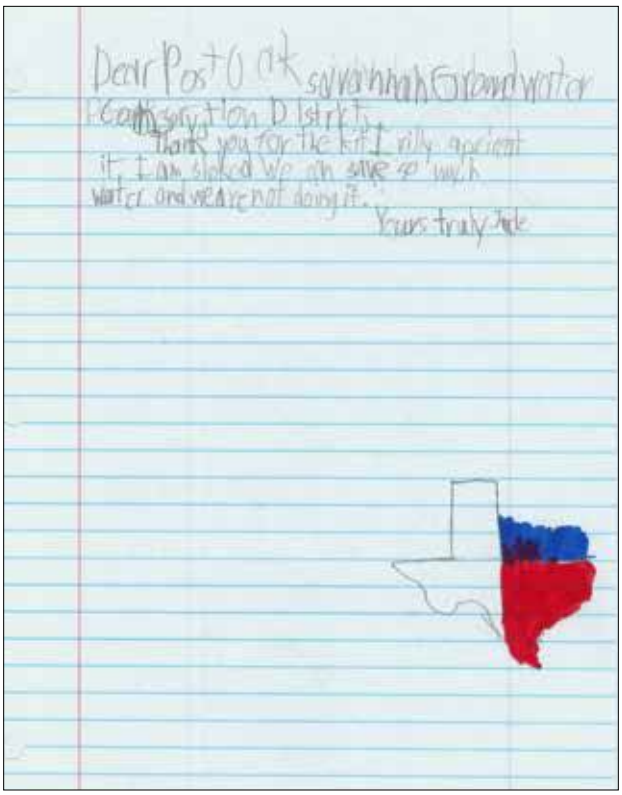

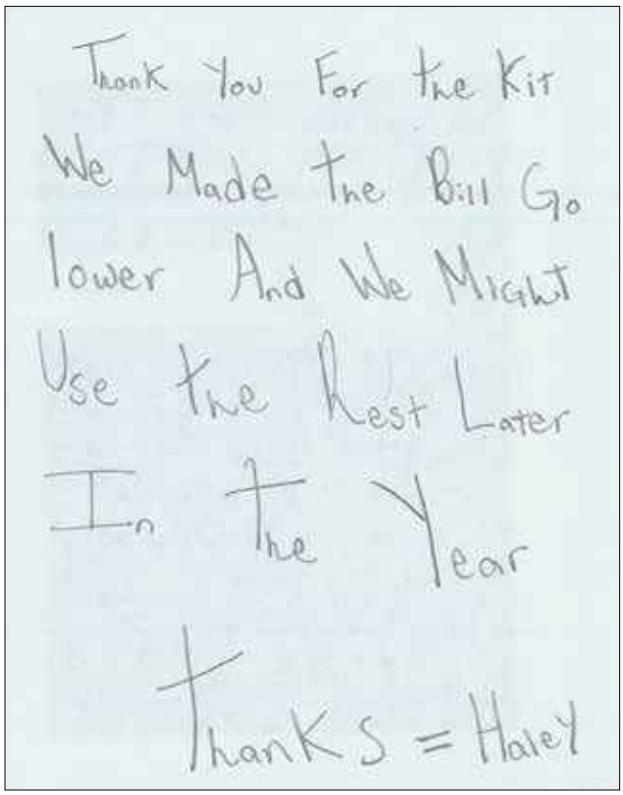

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