CITY OF FOSTER CITY LIVINGWISE®
PROGRAM SUMMARY REPORT

2017-2018

SUBMITTED BY:

RESOURCEACTION PROGRAMS

A FRANKLIN ENERGY COMPANY

City of Foster City LivingWise® Program Summary Report 2017-2018

Made possible by:

Submitted by:

RESOURCEACTION PROGRAMS

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July 2018

"The students were engaged and excited about the program. The program supports our science curriculum and 5th grade standards."

Sandra Sperow, Teacher
Audubon Elementary School

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"The students really enjoyed receiving the kit and all of the fun goodies inside to save water."

Amanda Ely, Teacher
Foster City Elementary School

Executive Summary

Resource Action Programs® (RAP) is pleased to present this Program Summary Report to the City of Foster City, which summarizes the 2017-2018 City of Foster City LivingWise® Program. The program was implemented in the City of Foster City service area in the state of California by 252 teachers, students, and their families. Funding was provided by the City of Foster City under the BAWSCA umbrella.

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 LivingWise Kit are also included.

Participant Satisfaction

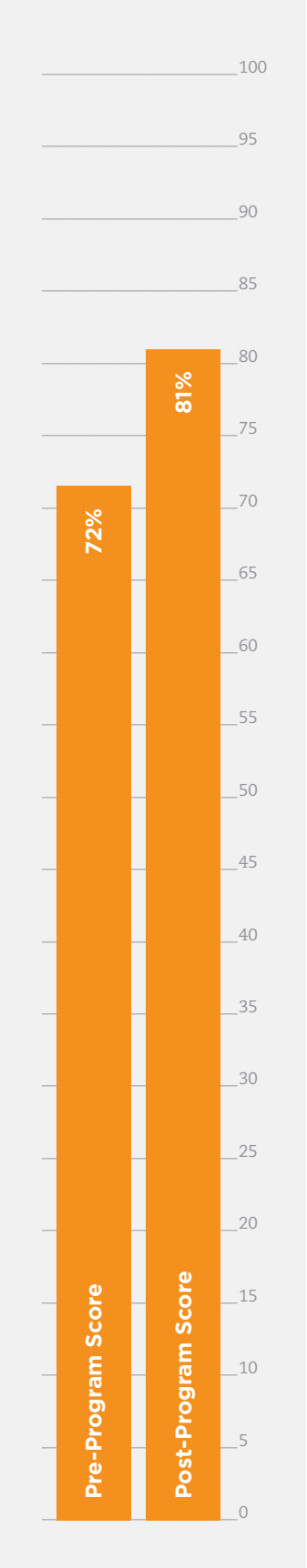
A successful program excites and engages participants. Students, parents, and teachers are asked to evaluate the program and provide personal comments. A sample of the feedback is given in the margin. ›

Teachers who indicated they would conduct this program again.

Teachers who indicated that the parents supported the program.

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

A summary of responses can be found in Appendix D.



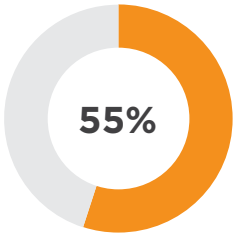
Knowledge Gained

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 **72%** to **81%**.

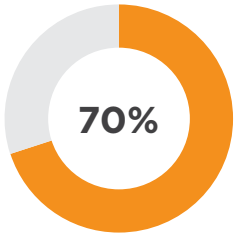
Data Obtained

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

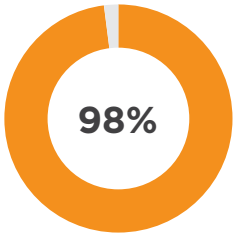
A summary of responses can be found in Appendix B.



Students who reported their family home is owned.



Students who reported that their water is heated by natural gas.

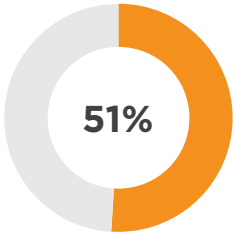


Students who reported their home has a dishwasher.

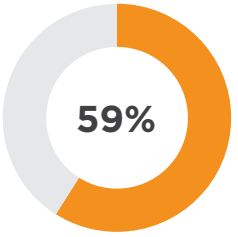
Measures Installed

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

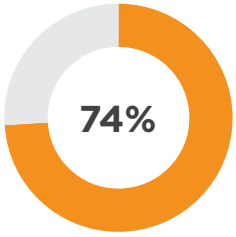
A summary of responses can be found in Appendix A.



Students who reported they installed the LED Light Bulb.



Students who reported they use the Shower Timer.



Students who reported they installed the LED Night Light.

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	
580,279	gallons of water saved
30,973	kWh of electricity saved
2,322	therms of gas saved
580,279	gallons of wastewater saved

PROJECTED LIFETIME SAVINGS	
3,117,395	gallons of water saved
221,369	kWh of electricity saved
12,871	therms of gas saved
3,117,395	gallons of wastewater saved

PROJECTED ANNUAL SAVINGS PER HOME	
2,303	gallons of water saved
123	kWh of electricity saved
9	therms of gas saved
2,303	gallons of wastewater saved

PROJECTED LIFETIME SAVINGS PER HOME	
12,371	gallons of water saved
878	kWh of electricity saved
51	therms of gas saved
12,371	gallons of wastewater saved

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

Program Overview

The City of Foster City LivingWise® 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 2017-2018 program was taught in 5th grade throughout the City of Foster City service area.

The City of Foster City LivingWise 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 energy and water efficiently. It is followed by hands-on, creative, problem-solving activities led by the classroom teacher.

All program materials support state and national academic standards 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 LivingWise 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 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 City of Foster City 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 25 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."

Program Materials

Each participant in the City of Foster City LivingWise® Program receives classroom materials 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*
Home Survey
Certificate of Achievement
LivingWise Kit Containing:

- High-Efficiency Showerhead*
- Kitchen Faucet Aerator*
- Bathroom Faucet Aerator*
- LED Light Bulb
- LED Night Light
- FilterTone® Alarm*
- Mini Tape Measure
- Digital Thermometer*
- Rain/Drip Gauge*
- Flow Rate Test Bag
- Natural Resources Fact Chart
- Toilet Leak Detector Tablets
- Shower Timer
- Installation DVD*
- Quick Start Guide*
- Parent/Guardian Program Evaluation
- High Efficiency Toilets Rebate Insert
- Lawn Be Gone! Program Insert
- Rain Barrel Program Insert

"GetWise" Wristband

BAWSCA "I conserve water" Water Bottle and Bag

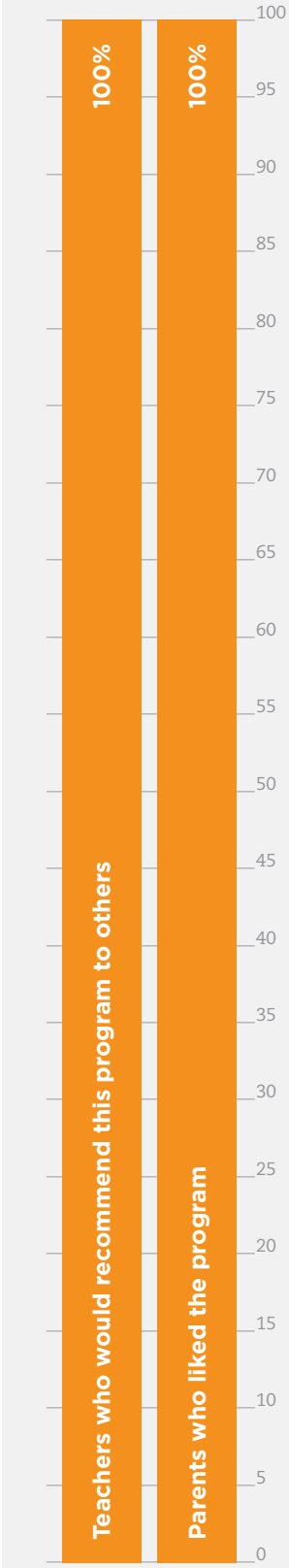
Program Website Access at Getwise.org

Toll-Free HELP Line

Each Teacher/Classroom Receives

Teacher Book
Step-by-Step Program Checklist
Lesson Plans
Teacher Survey Form
California State and National Academic Standards Chart
Pre/Post Test Answer Keys
Electricity, Water and Natural Gas Posters
Self-Addressed Postage-Paid Envelope

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



Program Enhancements

Resource Action Programs utilizes professionally recognized project management methodologies as part of our ongoing goal to provide the best possible customer service available. This approach allows us to set better expectations and deliver excellent customer service through better organization, scheduling and reporting of results.

Resource Action Programs worked with BAWSCA to award an additional $100 Mini Grant to those teachers who provided their student's surveys. This was offered as an incentive for teachers to return their students' surveys early.

Promotion of Sponsor Programs

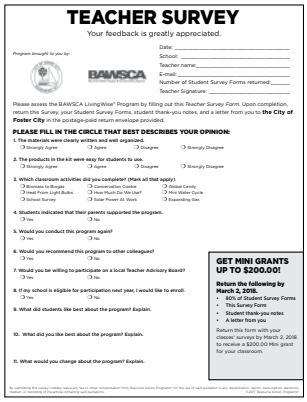
Resource Action Programs included inserts supplied by BAWSCA in each LivingWise Kit. These inserts offered information to the customers describing opportunities about other resource and water efficiency programs that BAWSCA offers in conjunction with the City of Foster City. The materials were used to publicize and boost enrollment in additional water efficiency programs. These promotions included:

- High Efficiency Toilets Rebate
- Lawn Be Gone! Program
- Rain Barrel Rebate Program

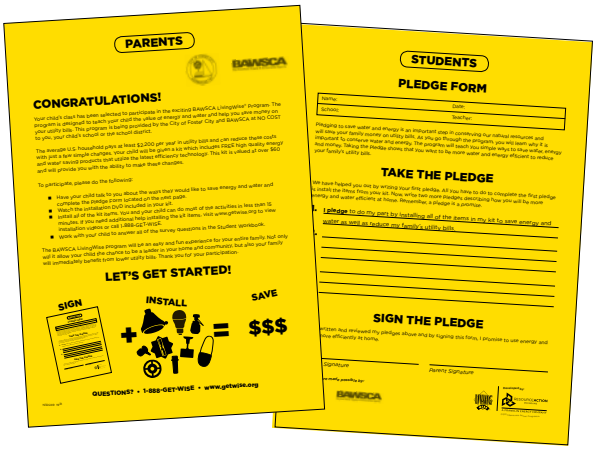
Custom Branding

In addition to increasing resource awareness and efficiency, the program strengthens bonds between BAWSCA, the City of Foster City and the community. One of the steps taken to ensure the greatest possible exposure is to feature the City of Foster City logo throughout each LivingWise Kit. In addition to the kit, the Teacher Survey Form, Parent Letter/Pledge Form, Student Guide, Student Workbook, Teacher Book, Certificate of Achievement, and the Quick Start Guide also feature BAWSCA and/or the City of Foster City branding.

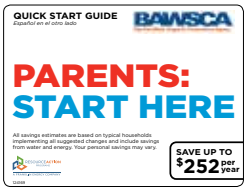
Program Materials



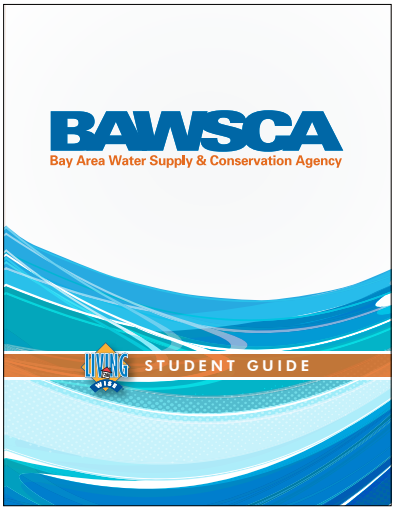
Teacher Survey Form



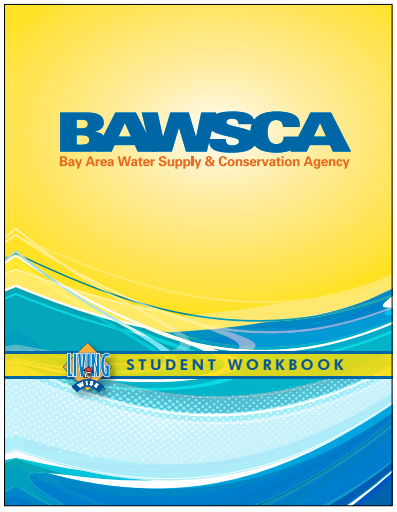
Parent Letter/Pledge Form



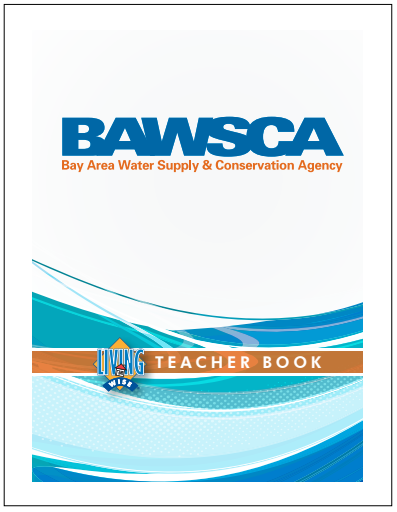
Quick Start Guide



Student Guide



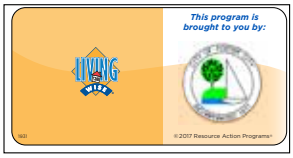
Student Workbook



Teacher Book

Certificate of Achievement

Kit Box



Kit Label

"As a teacher, what I liked about the program was the ease of use, the materials the families can keep, and how it connects to our curriculum."

Jennifer Flaherty, Teacher

Brewer Island Elementary School

Program Implementation

The 2017-2018 City of Foster City LivingWise® Program followed this comprehensive implementation schedule:

1. Identification of California state and national academic standards & benchmarks
2. Curriculum development and refinement (completed annually)
3. Curriculum correlation to California state and national academic standards & benchmarks
4. Materials modification to incorporate BAWSCA and the City of Foster City branding
5. Incentive program development
6. Teacher/school identification—with BAWSCA and the City of Foster City 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 5 that participated during the 2017-2018 school year.

For more than 25 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 650,000 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
- Energy and water efficiency measures
- Graphic and web design
- Kit assembly
- Marketing communications
- Shipping
- Printing
- Program management
- Participant enrollment
- Warehousing

The Implementation Team

For the City of Foster City LivingWise® Program, RAP assigned a specific implementation team to the City of Foster City 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 City of Foster City brand, and handled all program implementation for the City of Foster City. The City of Foster City also received the benefit of fully staffed support departments, which worked with the implementation team to define success for the City of Foster City. These departments include education, marketing, information technology, and warehouse/logistics.

Continuous Improvement

In addition to successful implementation of the City of Foster City LivingWise 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."

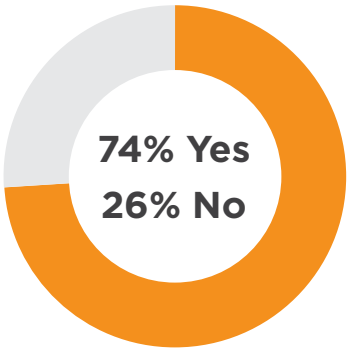
Program Impact

The City of Foster City LivingWise® Program has had a significant impact within the community. As illustrated below, the program successfully educated participants about energy and water 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.

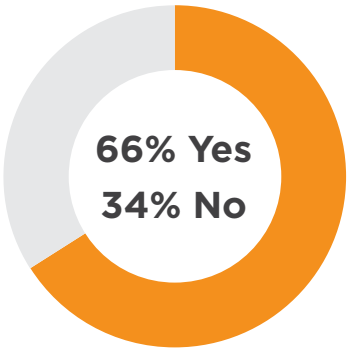
A. Home Survey

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.

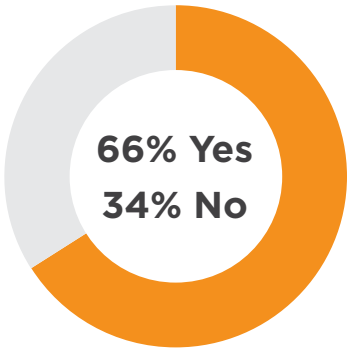
Students who indicated they worked with their family on the program.	**Yes - 74%**
Students who indicated their family changed the way they use water.	**Yes - 66%**
Students who indicated their family changed the way they use energy.	**Yes - 66%**



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



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

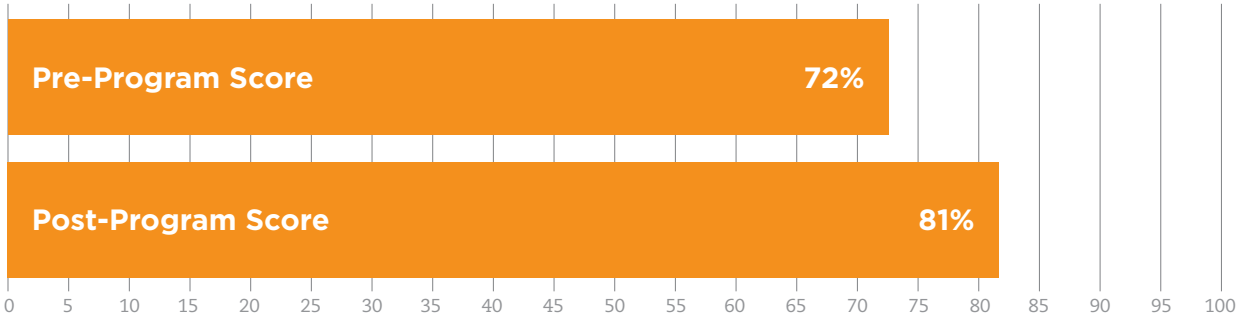


Students who indicated their family changed the way they use energy.

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 **7.2** questions correctly prior to being involved in the program and then improved to answer **8.1** questions correctly following participation.

Scores improved from 72% to 81%.



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, 252 households are expected to save the following resource totals. Savings from these actions and new behaviors, shown on the following page, 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:	**252**		
	Annual	**Lifetime**	
Projected reduction from Showerhead retrofit:	**151,768**	**1,517,678**	gallons
Product Life: **10 years**	**5,935**	**59,352**	kWh
	700	**7,004**	therms
Projected reduction from Kitchen Faucet Aerator retrofit:	**83,612**	**418,061**	gallons
Product Life: **5 years**	**2,362**	**11,810**	kWh
	285	**1,427**	therms
Projected reduction from Bathroom Faucet Aerator retrofit:	**131,193**	**655,965**	gallons
Product Life: **5 years**	**3,706**	**18,530**	kWh
	448	**2,239**	therms
Projected reduction from Shower Timer installation:	**180,946**	**361,893**	gallons
Estimated participation: **2 years**	**7,076**	**14,153**	kWh
	835	**1,670**	therms
Projected reduction from the Toilet Leak repair:	**16,258**	**81,291**	gallons
Estimated Useful Life (EUL): **5 years**			
Projected reduction from the Faucet Leak repair:	**16,501**	**82,507**	gallons
Estimated Useful Life (EUL): **5 years**			
Projected reduction from LED Lightbulb retrofit:	**5,641**	**55,003**	kWh
Product Life: **20 years**			
Projected reduction from LED Night Light retrofit:	**5,295**	**52,954**	kWh
Product Life: **10,000 hours**			
Projected reduction from FilterTone® Alarm installation:	**957**	**9,568**	kWh
Product Life: **10 years**	**53**	**532**	therms
TOTAL PROGRAM SAVINGS:	**580,279**	**3,117,395**	gallons
	30,973	**221,369**	kWh
	2,322	**12,871**	therms
TOTAL PROGRAM SAVINGS PER HOUSEHOLD:	**2,303**	**12,371**	gallons
	123	**878**	kWh
	9	**51**	therms

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 Survey 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 City of Foster City LivingWise 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.

"The students really enjoyed receiving the kit and all of the fun goodies inside to save water."
Amanda Ely, Foster City Elementary School

"The information in the program was comprehensible and useful."
Christine Marchese, Foster City Elementary School

"Trying out the materials with their families."
Jennifer Flaherty, Brewer Island Elementary School

"Installing the materials from the kit. The students especially liked the night light."
Sandra Sperow, Audubon Elementary School

What did you like best about the program? Explain.

"I like that it connects to conservation and our science standards."
Amanda Ely, Foster City Elementary School

"Easy to implement. It's important for families to know this information."
Christine Marchese, Foster City Elementary School

"The ease of use, the materials the families can keep, and how it connects to our curriculum."
Jennifer Flaherty, Brewer Island Elementary School

"The students were engaged and excited about the program. The program supports our science curriculum and 5th grade standards."
Sandra Sperow, Audubon Elementary School

Teacher Response

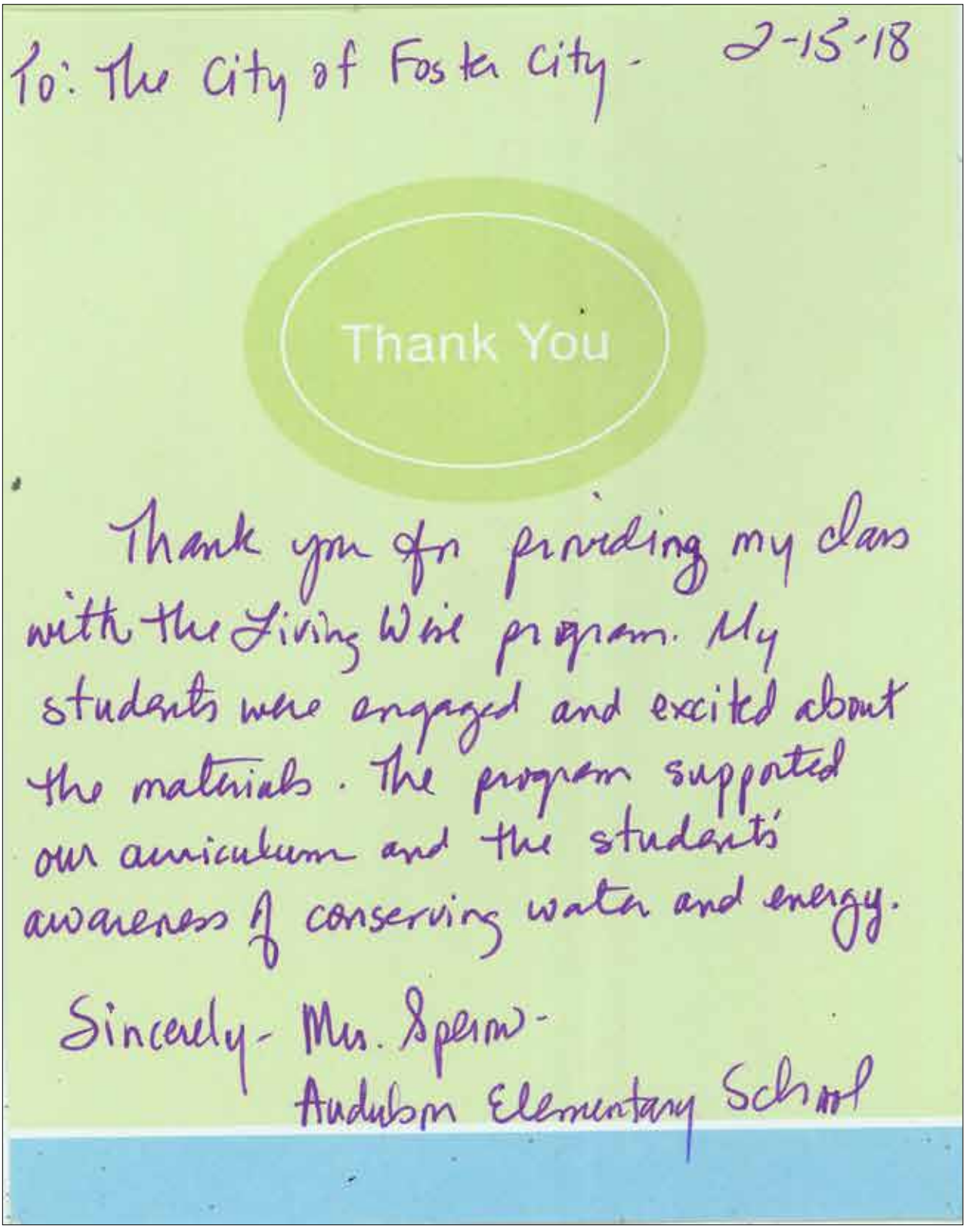
(A summary of responses can be found in Appendix D)

What would you change about the program? Explain.

"Shorten to 1 week if possible."
Christine Marchese, Foster City Elementary School

"Can't think of anything."
Jennifer Flaherty, Brewer Island Elementary School

E. Teacher Letters



To: The City of Foster City - 2-15-18

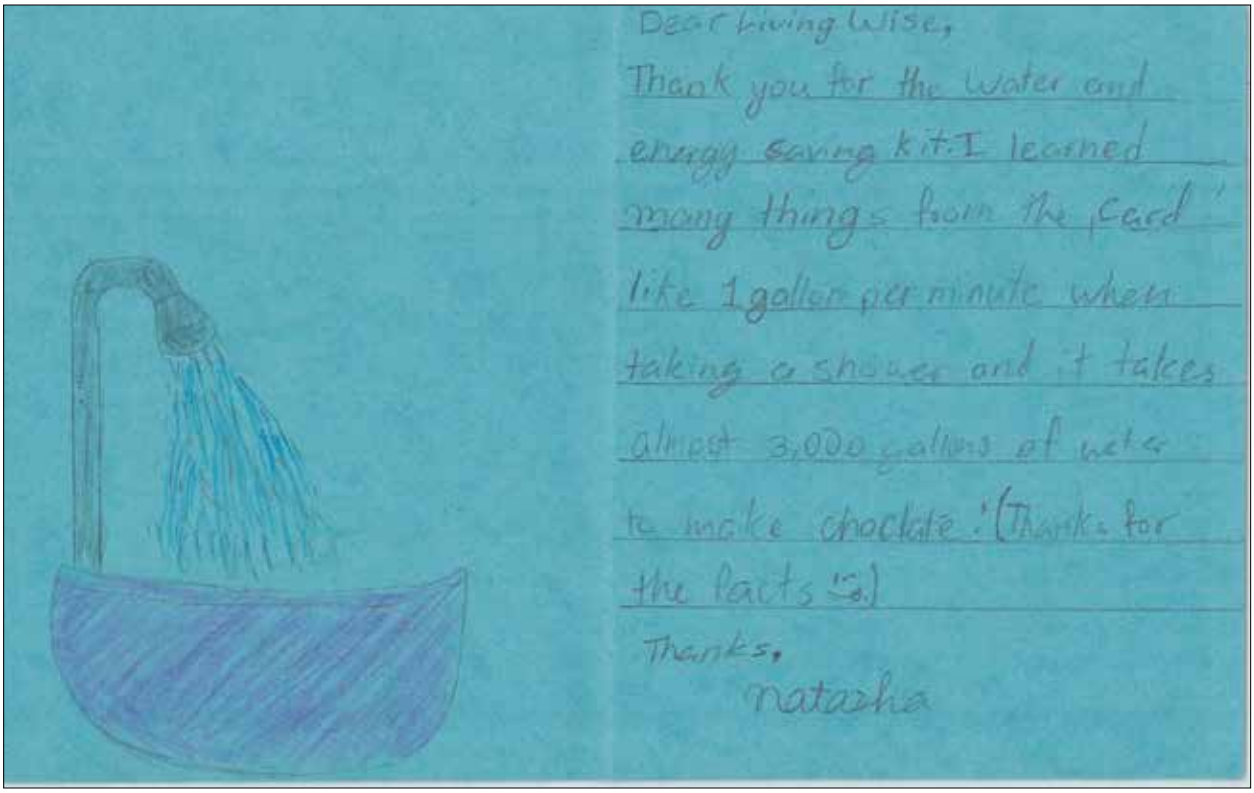
Thank You

Thank you for providing my class with the Living Wise program. My students were engaged and excited about the materials. The program supported our curriculum and the students' awareness of conserving water and energy.

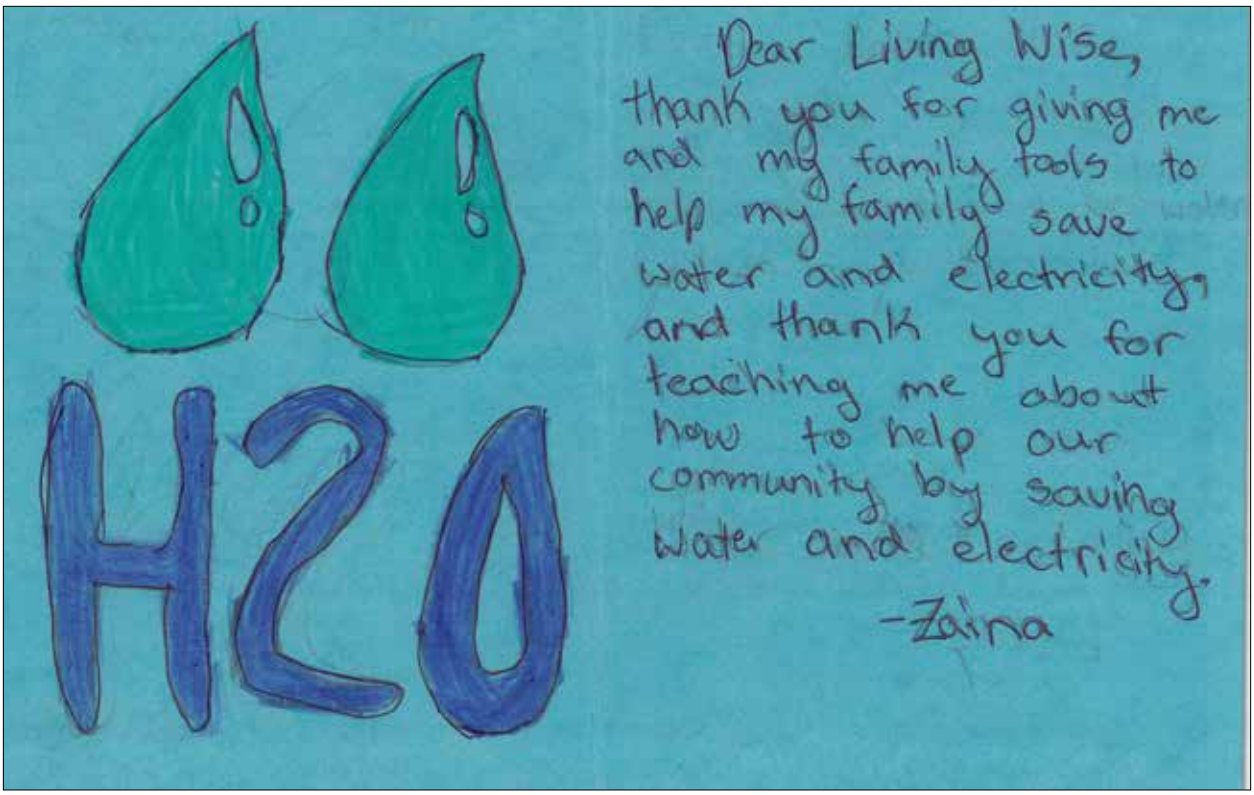
Sincerely - Mrs. Sperw -
Audubon Elementary School

F. Student Letters

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



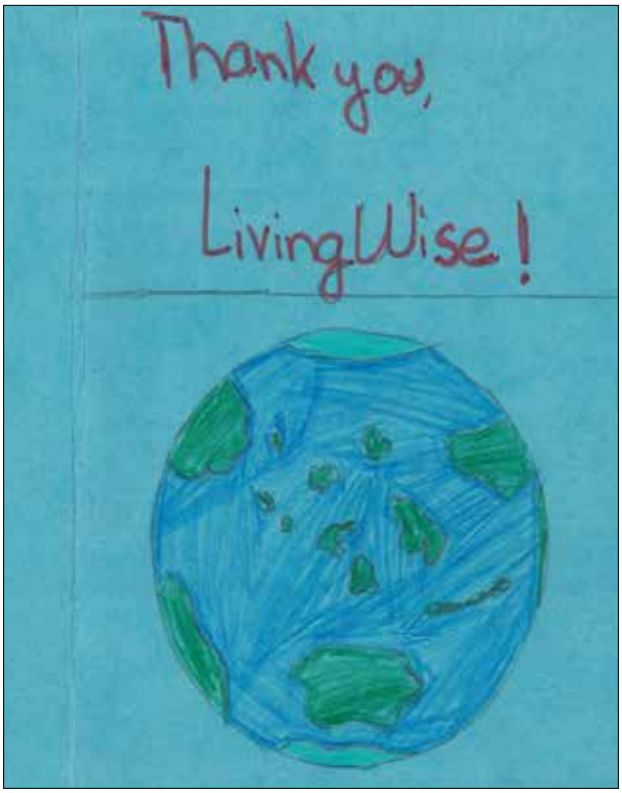
Dear Living Wise,
Thank you for the water and energy saving kit. I learned many things from the card like 1 gallon per minute when taking a shower and it takes almost 3,000 gallons of water to make chocolate. (Thanks for the facts ☺.)
Thanks,
Natasha

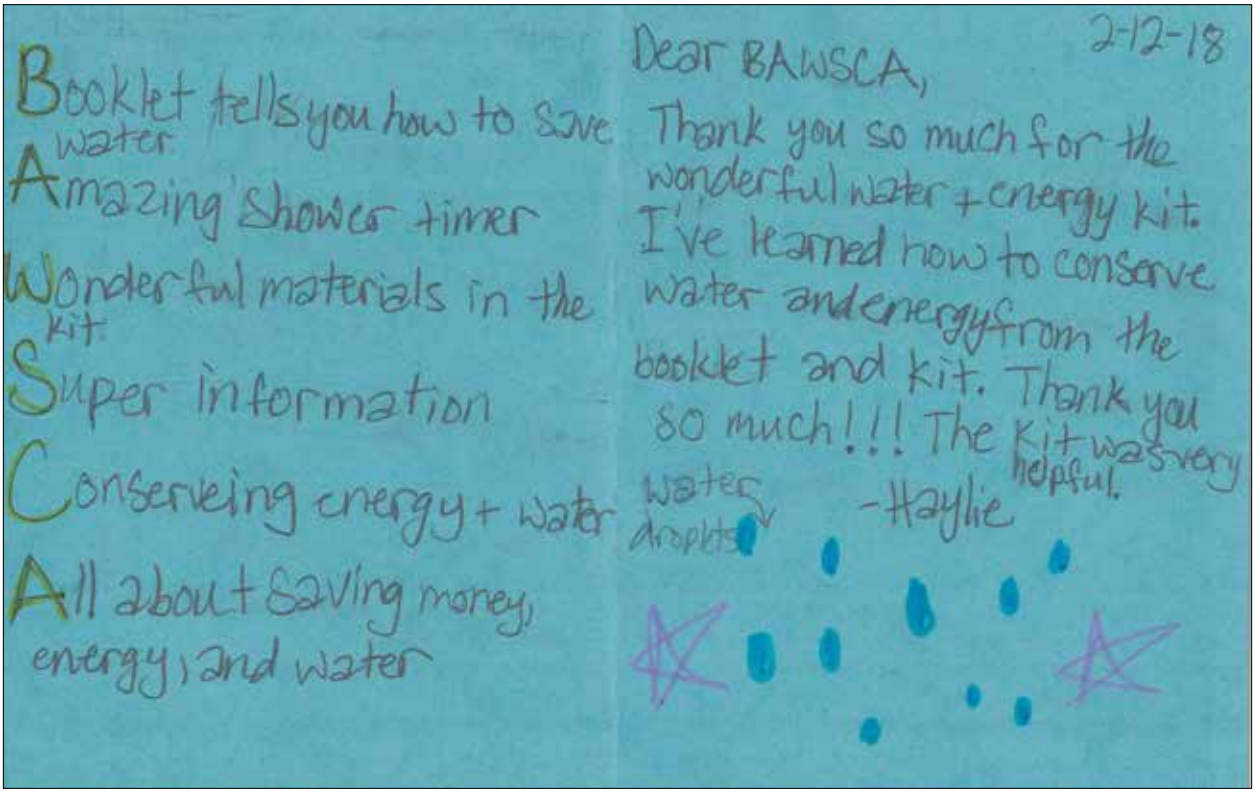


Dear Living Wise,
thank you for giving me and my family tools to help my family save water and electricity, and thank you for teaching me about how to help our community by saving water and electricity.
-Zaina

Student Letters

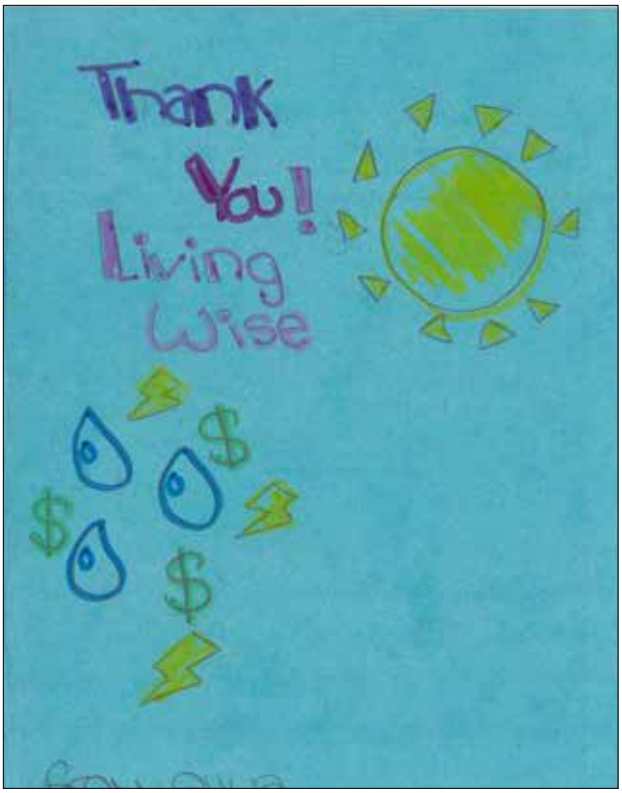
(A summary of responses can be found in Appendix E)

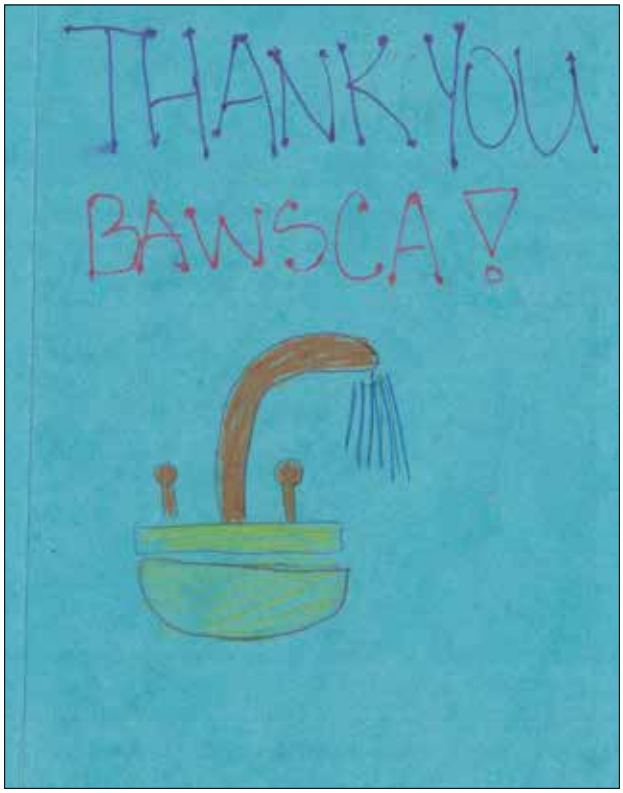


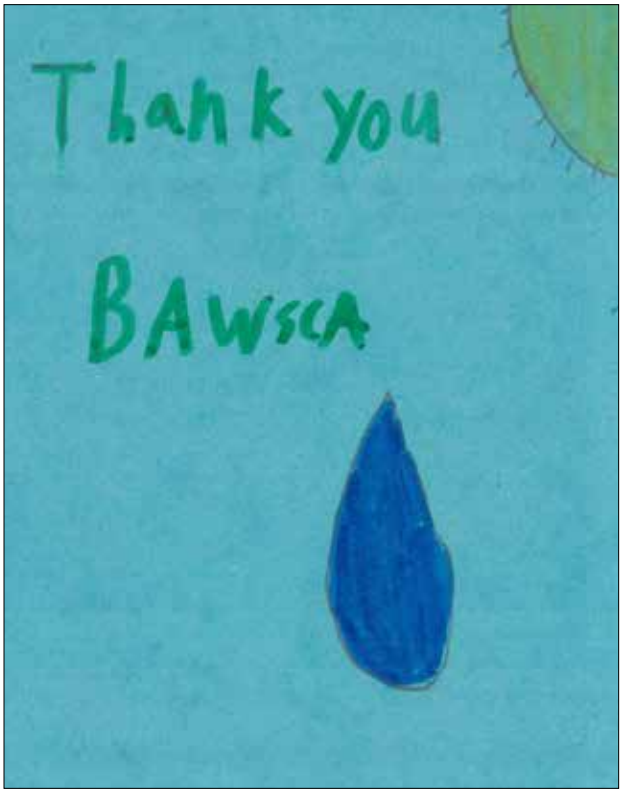


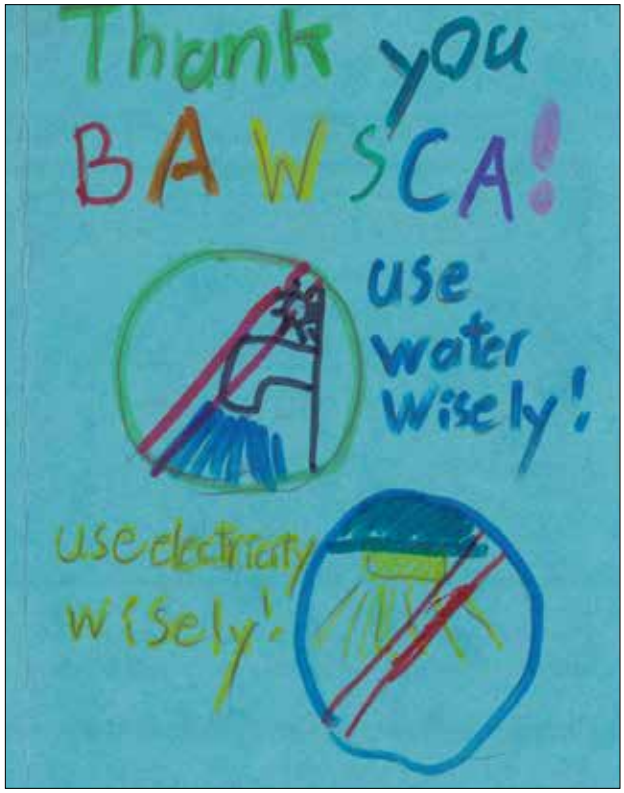
Student Letters

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









"The information in the program was comprehensible and useful."

Christine Marchese, Teacher
Foster City Elementary School

Appendices

Appendix A

Appendix B

Appendix C

Appendix D

Appendix E

Appendix F

Projected Savings from Showerhead Retrofit

Showerhead retrofit inputs and assumptions:

Average household size:	**4.10**	people[1]
Average number of full bathrooms per home:	**2.02**	full bathrooms per home[1]
% of water heated by gas:	**70.24%**	[1]
% of water heated by electricity:	**29.76%**	[1]
Installation / participation rate of:	**22.49%**	[1]
Average showerhead has a flow rate of:	**1.90**	gallons per minute[1]
Retrofit showerhead has flow rate of:	**1.24**	gallons per minute[1]
Number of participants:	**252**	[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:	**151,768**	gallons[4]
Showerhead retrofit projects a **lifetime** reduction of:	**1,517,678**	gallons[5]

Projected Electricity Savings:

Showerhead retrofit projects an **annual** reduction of:	**5,935**	kWh[2,6]
Showerhead retrofit projects a **lifetime** reduction of:	**59,352**	kWh[2,7]

Projected Natural Gas Savings:

Showerhead retrofit projects an **annual** reduction of:	**700**	therms[2,8]
Showerhead retrofit projects a **lifetime** reduction of:	**7,004**	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 Kitchen Faucet Aerator Retrofit

Kitchen Faucet Aerator retrofit inputs and assumptions:

Average household size:	**4.10**	people[1]
% of homes with a dishwasher:	**98.22%**	[1]
% of homes without a dishwasher:	**1.78%**	[1]
% of water heated by gas:	**70.24%**	[1]
% of water heated by electricity:	**29.76%**	[1]
Installation / participation rate of:	**17.16%**	[1]
Number of participants:	**252**	[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:	**83,612**	gallons[5]
Kitchen Faucet Aerator retrofit projects a **lifetime** reduction of:	**418,061**	gallons[6]

Projected Electricity Savings:

Kitchen Faucet Aerator retrofit projects an **annual** reduction of:	**2,362**	kWh[4,7]
Kitchen Faucet Aerator retrofit projects a **lifetime** reduction of:	**11,810**	kWh[4,8]

Projected Natural Gas Savings:

Kitchen Faucet Aerator retrofit projects an **annual** reduction of:	**285**	therms[4,9]
Kitchen Faucet Aerator retrofit projects a **lifetime** reduction of:	**1,427**	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 flow rate – Retrofit Kitchen Aerator flow 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 flow rate – Retrofit Kitchen Aerator flow 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 efficiency (0.90)] x % of Water Heated by Electricity

8 Projected Lifetime Water Savings x [(8.33lbs. / gallon x 35°FΔT) ÷ (3413 x water heater efficiency (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 efficiency (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 efficiency (0.60)] x % of Water Heated by Natural Gas

Projected Savings from Bathroom Faucet Aerator Retrofit

Bathroom Faucet Aerator retrofit inputs and assumptions:

Average household size:	**4.10**	people[1]
% of water heated by gas:	**70.24%**	[1]
% of water heated by electricity:	**29.76%**	[1]
Installation / participation rate of:	**15.48%**	[1]
Number of participants:	**252**	[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:	**131,193**	gallons[5]
Bathroom Faucet Aerator retrofit projects a **lifetime** reduction of:	**655,965**	gallons[6]

Projected Electricity Savings:

Bathroom Faucet Aerator retrofit projects an **annual** reduction of:	**3,706**	kWh[4,7]
Bathroom Faucet Aerator retrofit projects a **lifetime** reduction of:	**18,530**	kWh[4,8]

Projected Natural Gas Savings:

Bathroom Faucet Aerator retrofit projects an **annual** reduction of:	**448**	therms[4,9]
Bathroom Faucet Aerator retrofit projects a **lifetime** reduction of:	**2,239**	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 flow rate – Retrofit Bathroom Aerator flow 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 flow rate – Retrofit Bathroom Aerator flow 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 efficiency (0.90)] x % of Water Heated by Electricity

8 Projected Lifetime Water Savings x [(8.33lbs. / gallon x 35°FΔT) ÷ (3413 x water heater efficiency (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 efficiency (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 efficiency (0.60)] x % of Water Heated by Natural Gas

Projected Savings from Shower Timer Installation

Shower Timer inputs and assumptions:		
% of water heated by gas:	**70.24%**	[1]
% of water heated by electricity:	**29.76%**	[1]
Installation / participation rate of Shower Timer:	**58.58%**	[1]
Average showerhead has a flow rate of:	**1.90**	gallons per minute[1]
Retrofit showerhead has flow rate of:	**1.24**	gallons per minute[1]
Number of participants:	**252**	[1]
Average of baseline and retrofit showerhead flow rate:	**1.57**	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:	**180,946**	gallons[6]
Shower Timer installation projects a **lifetime** reduction of:	**361,893**	gallons[7]
Projected Electricity Savings:		
Shower Timer installation projects an **annual** reduction of:	**7,076**	kWh[8]
Shower Timer installation projects a **lifetime** reduction of:	**14,153**	kWh[9]
Projected Natural Gas Savings:		
Shower Timer installation projects an **annual** reduction of:	**835**	therms[10]
Shower Timer installation projects a **lifetime** reduction of:	**1,670**	therms[11]

1 Data Reported by Program Participants.

2 Average of the baseline GPM and the retrofit GPM

3 (March 4, 2010). EPA WaterSense® Specification for Showerheads Supporting Statement. Retrieved from http://www.epa.gov/WaterSense/docs/showerheads_finalsuppstat508.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 retrofit flow) × (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 Toilet Leak Repair

Toilet Leak repair inputs and assumptions:

Number of participants:	**252**	[1]
% of toilets leaking:	**8.98%**	[1]
% of toilets where the leak was repaired:	**6%**	[1]
Number of homes with fixed toilet leaks:	**1.29**	[1]
USGS gallons lost per year per leak:	**12,621.29**	GPY per leak[2]
EUL (years of water savings):	**5.00**	years[3]

Projected Water Savings:

Toilet Leak repair projects an **annual** reduction of:	**16,258**	gallons/year[4]
Toilet Leak repair projects a **lifetime** reduction of:	**81,291**	gallons[5]

1 Data Reported by Program Participants.

2 http://www.epa.gov/WaterSense/pubs/fixleak.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 fixed toilet leaks

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

Projected Savings from Faucet Leak Repair

Faucet Leak Repair inputs and assumptions:

Number of participants:	**252**	[1]
Number of faucets leaking:	**12**	[1]
% of all faucets where the leak was repaired:	**16.05%**	[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 (years of water savings):	**5.00**	years[3]

Projected Water Savings:

Faucet Leak repair projects an **annual** reduction of:	**16,501**	gallons/year[4]
Faucet Leak repair projects a **lifetime** reduction of:	**82,507**	gallons[5]

1 Data Reported by Program Participants. Number of faucets leaking is based upon a weighted average

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 fixed faucet leaks

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

Projected Savings from LED Light Bulb Retrofit

LED Light Bulb retrofit inputs and assumptions:

Product life:	**20**	years[1]
Watts used by the LED light bulb:	**9**	watts[1]
Hours of operation per day:	**2.81**	hours per day[2]
Average watts used by the replaced light bulb:	**51.65**	watts[3]
Installation / participation rate of:	**51.18%**	[3]
Number of participants:	**252**	[3]

Projected Electricity Savings:

The LED Light Bulb retrofit projects an **annual** reduction of:	**5,641**	kWh[2,4]
The LED Light Bulb retrofit projects a **lifetime** reduction of:	**55,003**	kWh[2,5]

1 Provided by manufacturer.

2 Frontier Associates. (2011). Oncor's LivingWise Program: Measurement & Verification Update.

3 Data reported by program participants.

4 {[(Average wattage of light bulb replaced - Wattage of LED light bulb) x Hours of operation per day x 365 Days] ÷ 1,000} x Number of participants x Installation rate

5 {[(Average wattage of light bulb replaced - Wattage of LED light bulb) x Product Life] ÷ 1,000} x Number of participants x Installation rate

Projected Savings from LED Night Light Installation

LED Night Light retrofit inputs and assumptions:

Average length of use:	**4,380**	hours per year[1]
Average night light uses:	**7**	watts
Retrofit night light uses:	**0.50**	watts
Product life:	**10**	years[2]
Energy saved per year:	**28**	kWh per year
Energy saved over life expectancy:	**285**	kWh
Installation / participation rate of:	**73.81%**	[3]
Number of participants:	**252**	[3]

Projected Electricity Savings:

The LED Night Light retrofit projects an **annual** reduction of:	**5,295**	kWh
The LED Night Light retrofit projects a **lifetime** reduction of:	**52,954**	kWh

1 Assumption (12 hours per day)

2 Product life provided by manufacturer

3 Data reported by program participants

Projected Savings from FilterTone® Alarm Installation

FilterTone® installation inputs and assumptions:

Annual energy (electricity) use by a central system air conditioner:	**1,637**	kWh[1]
Annual energy (natural gas) use by central space heating or furnace:	**173**	therms[1]
Projected increase in efficiency (electricity):	**1.75%**	[2]
Projected increase in efficiency (natural gas):	**0.92%**	[2]
Product life:	**10**	years[3]
Installation / participation rate of:	**13.25%**	[4]
Number of participants:	**252**	[4]

Projected Electricity Savings:

The FilterTone installation projects an **annual** reduction of:	**957**	kWh[5]
The FilterTone installation projects a **lifetime** reduction of:	**9,568**	kWh[6]

Projected Natural Gas Savings:

The FilterTone installation projects an **annual** reduction of:	**53**	therms[7]
The FilterTone installation projects a **lifetime** reduction of:	**532**	therms[8]

1 *U.S. Department of Energy, Energy Information Administration 2005 Residential Energy Consumption Web site for California: http://www.eia.gov/consumption/residential/data/2005/*

2 *Reichmuth P.E., Howard. (1999). Engineering Review and Savings Estimates for the 'Filtertone' Filter Restriction Alarm.*

3 *Provided by manufacturer.*

4 *Data reported by program participants.*

5 *Annual energy (electricity) use by a central air conditioner, heat pump or furnace x Projected increase in efficiency (electricity) x Installation rate x Number of participants*

6 *Annual energy (electricity) use by a central air conditioner, heat pump or furnace x Projected increase in efficiency (electricity) x Installation rate x Number of participants x Product life*

7 *Annual energy (natural gas) use by a central air conditioner, heat pump or furnace x Projected increase in efficiency (natural gas) x Installation rate x Number of participants*

8 *Annual energy (natural gas) use by a central air conditioner, heat pump or furnace x Projected increase in efficiency (natural gas) x Installation rate x Number of participants x Product life*

Home Check-Up

1 What type of home do you live in?	
Single Family home (mobile)	2%
Single Family home (manufactured)	6%
Single Family home (built)	53%
Multi-Family (2-4 units)	16%
Multi-Family (5-20 units)	8%
Multi-Family (21+ units)	15%
2 Was your home built before 1992?	
Yes	83%
No	17%
3 Is your home owned or rented?	
Owned	55%
Rented	45%
4 How many kids live in your home (age 0-17)?	
1	23%
2	58%
3	15%
4	2%
5+	2%
5 How many adults live in your home (age 18+)?	
1	3%
2	90%
3	4%
4	2%
5+	1%
6 Does your home have a programmable outdoor sprinkler system?	
Yes	65%
No	35%
7 Does your home have a programmable thermostat?	
Yes	63%
No	37%
8 What is the main source of heating in your home?	
Natural Gas	64%
Electric Heater	35%
Propane	1%
Heating Oil	0%
Wood	0%
Other	1%

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

Home Check-Up

(continued)

9 What type of air conditioning unit do you have?

Central Air Conditioner	16%
Evaporative Cooler	0%
Room Unit	7%
Don't Have One	78%

10 Does your home have a dishwasher?

Yes	98%
No	2%

11 How many half-bathrooms are in your home?

0	62%
1	35%
2	2%
3	1%
4+	0%

12 How many full bathrooms are in your home?

1	16%
2	67%
3	16%
4	1%
5+	0%

13 How many toilets are in your home?

1	10%
2	46%
3	41%
4	2%
5+	2%

14 How is your water heated?

Natural Gas	70%
Electricity	30%

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	13%
1.1 - 1.5 GPM	19%
1.6 - 2.0 GPM	24%
2.1 - 2.5 GPM	28%
2.6 - 3.0 GPM	11%
3.1+ GPM	6%

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

Yes	22%
No	78%

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

0 - 1.0 GPM	25%
1.1 - 1.5 GPM	48%
1.6 - 1.75 GPM	27%

4 Are you using the Shower Timer to take 5-minute showers?

Yes	59%
No	41%

5 What is the flow rate of your old kitchen faucet?

0 - 1.0 GPM	12%
1.1 - 1.5 GPM	30%
1.6 - 2.0 GPM	23%
2.1 - 2.5 GPM	16%
2.6 - 3.0 GPM	14%
3.1+ GPM	6%

6 Did your family install the new Kitchen Faucet Aerator?

Yes	17%
No	83%

7 Did your family install the new Bathroom Faucet Aerator?

Yes	15%
No	85%

8 Did your family install the 9-watt LED Light Bulb?

Yes	51%
No	49%

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

Home Activities

(continued)

9 If you answered "yes" to question 8, what was the wattage of the incandescent bulb you replaced?

40-watt	19%
60-watt	31%
75-watt	10%
100-watt	3%
Other	37%

10 Did your family install the FilterTone Alarm?

Yes	13%
No	87%

11 How much did your family turn down the thermostat in winter for heating?

1 - 2 Degrees	17%
3 - 4 Degrees	16%
5+ Degrees	12%
Didn't Adjust Thermostat	55%

12 How much did your family turn up the thermostat in summer for cooling?

1 - 2 Degrees	6%
3 - 4 Degrees	10%
5+ Degrees	4%
Didn't Adjust Thermostat	79%

13 Did your family install the LED Night Light?

Yes	74%
No	26%

14 Did your family lower your water heater settings?

Yes	25%
No	75%

15 Did your family raise the temperature on your refrigerator?

Yes	15%
No	85%

16 Was your toilet leaking?

Yes	9%
No	91%

17 If you answered "yes" to question 16, was the leak repaired?

Yes	6%
No	7%
No, my toilet did not leak	88%

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

Home Activities

(continued)

18 How many faucets were leaking?

0	94%
1	5%
2	0%
3	1%
4	0%
5+	0%

19 If you answered "yes" to question 18, was the leak repaired?

Yes, all of them	16%
Yes, some of them	2%
None	81%

20 Did your family adjust the outdoor watering schedule?

Yes	28%
No	72%

21 Did you work with your family on this program?

Yes	74%
No	26%

22 Did your family change the way they use water?

Yes	66%
No	34%

23 Did your family change the way they use energy?

Yes	66%
No	34%

24 How would you rate the BAWSCA LivingWise Program?

Great	40%
Pretty Good	36%
Okay	22%
Not So Good	3%

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

Participant List

SCHOOL NAME	TEACHER NAME	T	S
Audubon Elementary School	Sandra Sperow	1	60
Brewer Island Elementary School	Jennifer Flaherty	1	32
Brewer Island Elementary School	Erin LemMon	1	32
Foster City Elementary School	Amanda Ely	1	31
Foster City Elementary School	Judy Ngov	1	30
Foster City Elementary School	Miriam Culjak	1	30
Foster City Elementary School	Christine Marchese	1	30
	TOTALS	**7**	**245**
	TOTAL PARTICIPANTS	**252**	

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	75%
Agree	25%
Disagree	0%
Strongly Disagree	0%

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

Strongly Agree	50%
Agree	50%
Disagree	0%
Strongly Disagree	0%

3 Students indicated that their parents supported the program.

Yes	100%
No	0%

4 Would you conduct this Program again?

Yes	100%
No	0%

5 Would you recommend this program to other colleagues?

Yes	100%
No	0%

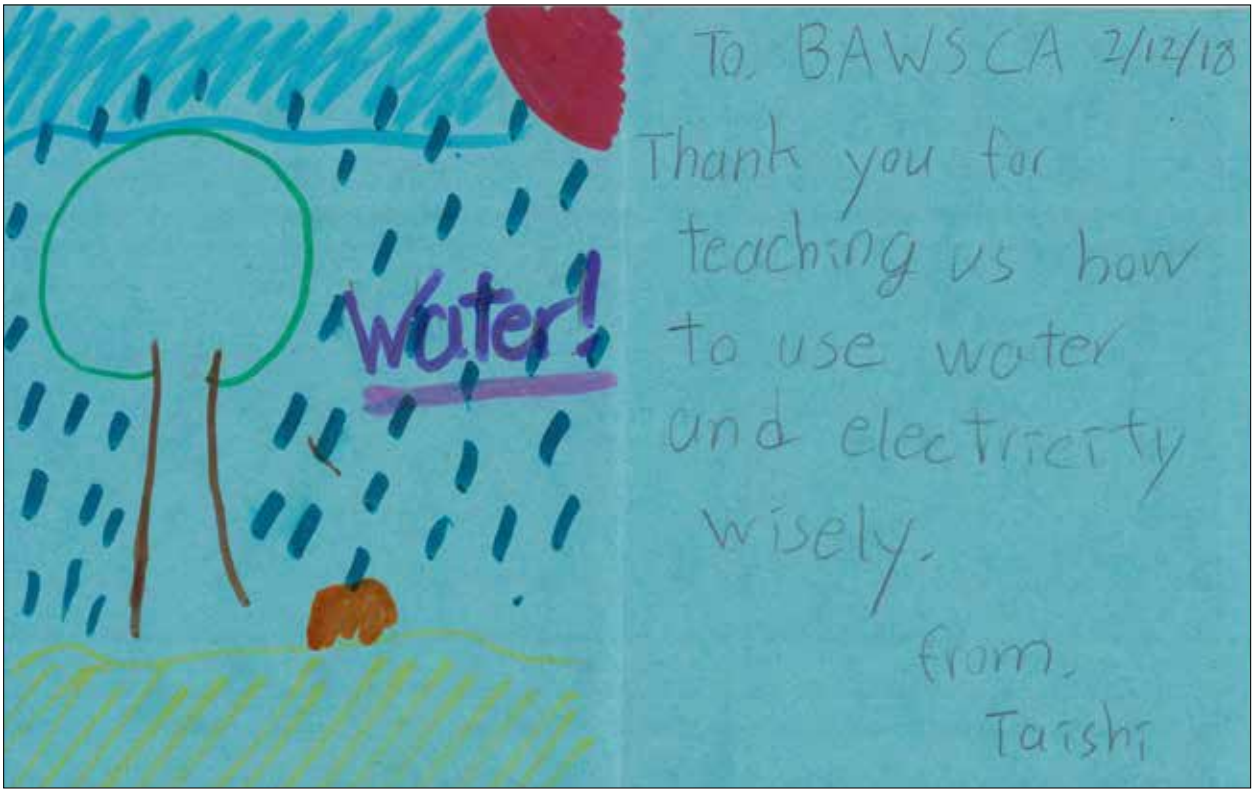
6 If my school is eligible for participation next year, I would like to enroll.

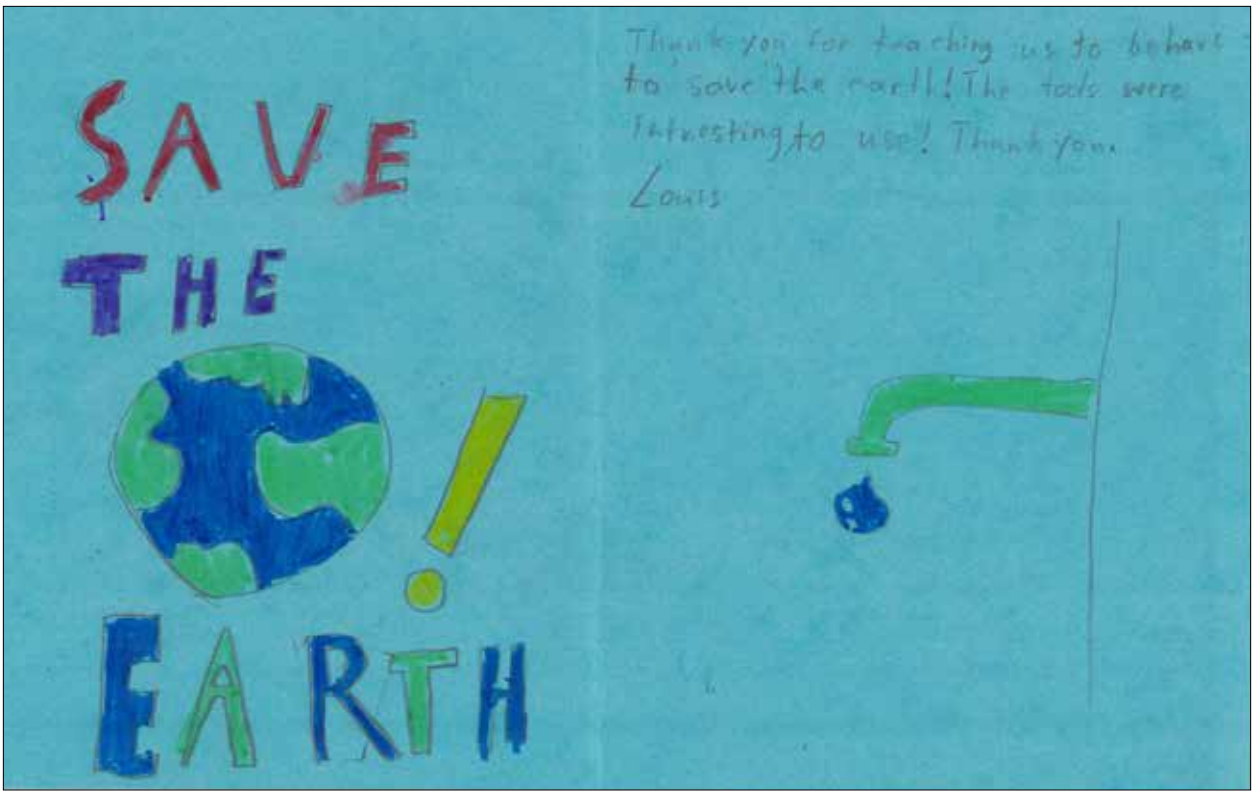
Yes	100%
No	0%

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

Student Letters

(continued from page 25)





Student Letters

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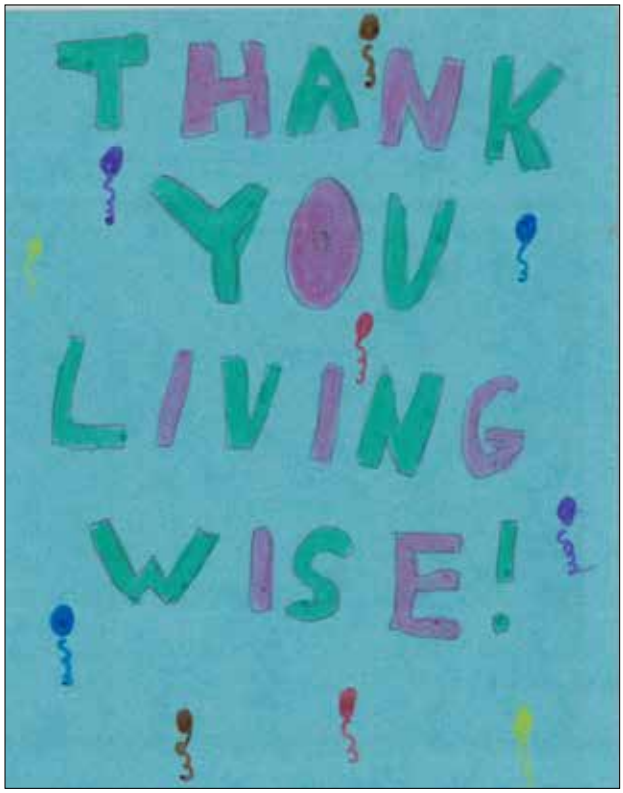

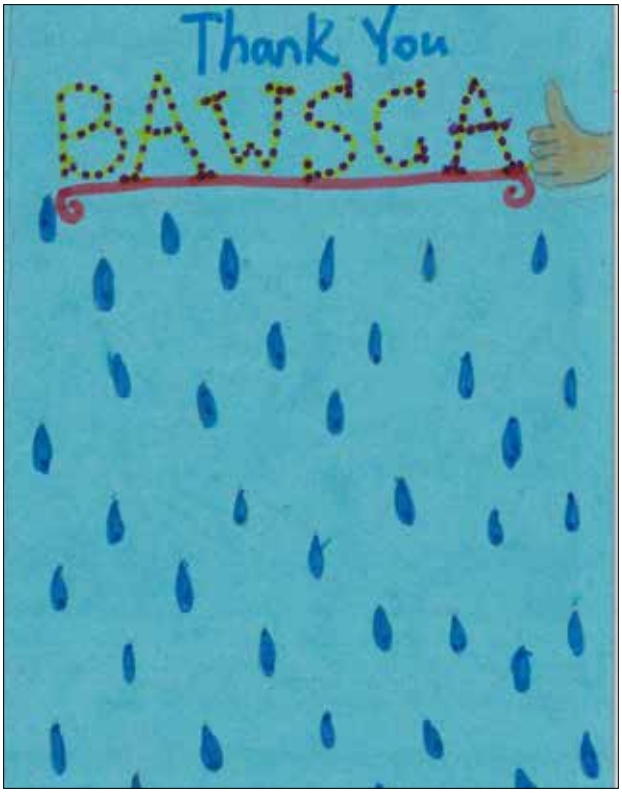

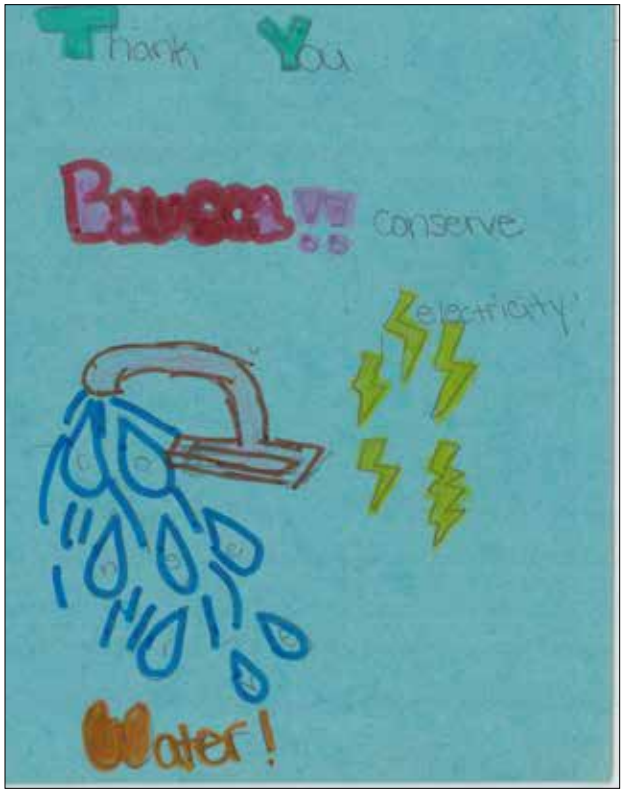

Student Letters

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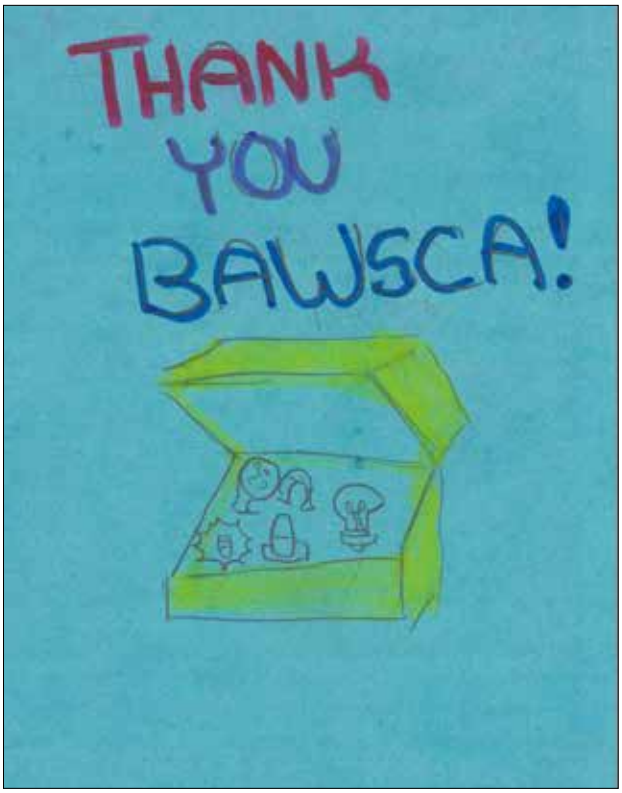

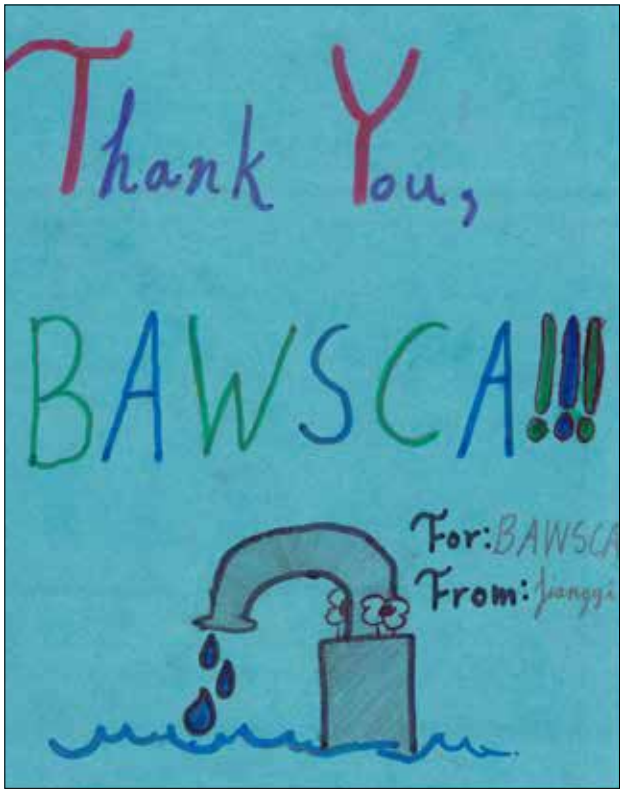

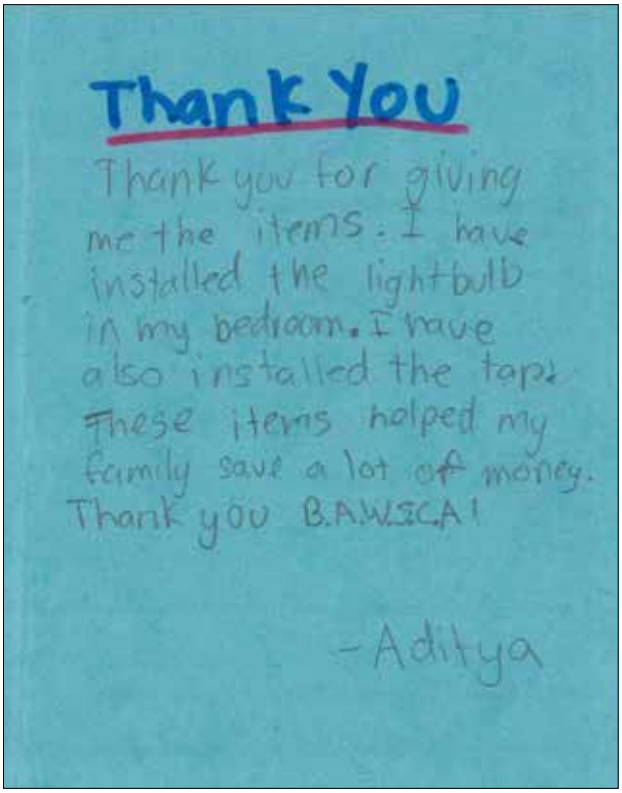

BAWSCA Member Agencies

MEMBER AGENCY	WATERWISE	LIVINGWISE
City of Redwood City	593	N/A
City of Menlo Park	143	N/A
City of Burlingame	71	N/A
City of Hayward	601	N/A
North Coast County W.D.	194	N/A
Town of Hillsborough	73	N/A
Mid-Peninsula W.D.	N/A	388
City of Foster City	N/A	252
TOTALS	**1,675**	**640**
TOTAL PARTICIPANTS	**2,315**	

Projected Savings from BAWSCA Combined Programs

	Annual	Lifetime	
Reduction from Showerhead retrofit:	3,043,424	30,434,244	gallons
Product Life: 10 years	13,927	139,275	therms
	121,357	1,213,569	kWh
Reduction from Kitchen Faucet Aerator retrofit:	2,830,147	14,150,736	gallons
Product Life: 5 years	9,616	48,082	therms
	80,784	403,918	kWh
Reduction from Bathroom Faucet Aerator retrofit:	3,130,160	15,650,799	gallons
Product Life: 5 years	10,720	53,601	therms
	87,699	438,494	kWh
Reduction from Shower Timer installation:	1,914,003	3,828,007	gallons
Product Life: 2 years	8,977	17,953	therms
	73,350	146,699	kWh
Projected reduction from the Toilet Leak repair:	1,002,038	5,010,189	gallons
Estimated Useful Life (EUL): 5 years			
Projected reduction from the Faucet Leak repair:	1,037,360	5,186,801	gallons
Estimated Useful Life (EUL): 5 years			
Projected reduction from LED Light Bulb retrofit:	11,496	112,087	kWh
Product Life: 10,000 hours			
Projected reduction from LED Night Light retrofit:	14,876	148,765	kWh
Product Life: 10,000 hours			
Projected reduction from FilterTone® Alarm installation:	2,134	21,340	kWh
Product Life: 10 years	119	1,186	therms
TOTAL PROGRAM SAVINGS:	12,957,133	74,260,776	gallons
	43,359	260,097	therms
	391,696	2,484,872	kWh
TOTAL PROGRAM SAVINGS PER HOUSEHOLD:	5,284	30,286	gallons
	18	106	therms
	160	1,013	kWh

RESOURCE**ACTION**
PROGRAMS

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