WASTE MANAGEMENT

THINK GREEN®

SNOHOMISH COUNTY ELEMENTARY SCHOOL WASTE REDUCTION AND RECYCLING PROGRAM

School-wide Assembly, Classroom Workshops, Family Outreach, Technical Assistance, and Action Projects

2014 DRAFT EVALUATION REPORT



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February 2014 - December 2014

Triangle ASSOCIATES, INC.

Table of Contents

Program Background and Overview

In 2014, Waste Management worked with Triangle Associates, Inc. (Triangle) to offer the third year of waste reduction and recycling (WRR) programs to schools in select areas of Snohomish County. The overall intent of the program was to increase recycling and reduce waste by educating school communities, including students, staff, and families, on waste reduction and why and how to recycle and compost.

The 2014 program built on the three key components developed and piloted in the two previous years: school-wide assembly shows, individual classroom workshops, and technical and project assistance for schools interested in developing or expanding waste reduction and recycling programs. Key messages and scripts for program components were developed with consultation and oversight by Waste Management and the Snohomish County Solid Waste Department. In addition, the 2014 program expanded to offer the following new elements:

- Increase in emphasis, throughout all program components, to share messages with families and take action at home (including new pre-workshop take-home survey for students to complete with families, and updated assembly and workshop script messaging).
- Technical and project assistance pilots tailored to select secondary schools.
- Post-assistance feedback surveys for technical assistance and action projects.
- Assistance for schools with Washington Green Schools certification goals.
- Direct family outreach through an interactive recycling "booth" located at family-focused school events.

The 2014 program reached 63 schools, and provided 37 assemblies, 214 classroom workshops, in-depth technical assistance to 23 schools, action project assistance for 11 student groups and outreach booths at six family night events. The program had a total of 28,712 contacts, with some contacts participating in multiple program components. Of the 63 schools participating in the program in 2014, 33 of them were new and had not previously taken part in any of the Waste Management program components.

Table 1 provides an overview of the program components and numbers served in the Waste Reduction and Recycling Program in 2014.

Table 1 Breakdown of Program Activities 2014					
Program Component	**Activity**	**# of Schools**	**# of Districts**	**# of Programs**	**# of Students/ Teachers**
Assembly	School-wide assembly teaches the 4Rs and the importance of keeping waste out of the landfill.	27	9 districts, 4 private	37	10,074
Classroom Workshops	Classroom workshops expand on concepts introduced in the assembly.	41	10 districts, 4 private	214	5,348
Technical Assistance	Technical assistance helps schools implement or improve waste reduction and recycling programs.	23	7 districts, 1 private	21 site visits	12,597[1]
Action Projects	Green Teams support student groups with projects to increase school-wide recycling practices and awareness.	11	6	11	203
Family Outreach	Family outreach incorporates recycling messages and best practices at school-based events.	6	2 districts, 1 private	6 events	490[2]
				TOTAL CONTACTS	28,712[3]

[1] This total is based on the number of students and teachers at each school.
[2] This total equals the approximate number of attendees (students and family members) that visited the Waste Management booth, not the total number attending the event
[3] This number reflects the total number of students and teacher contacts, understanding that students may have participated in multiple program components

Assembly Program

The goal of the assembly component is to teach the entire school about the importance of the 4Rs (rethink, reduce, reuse and recycle) and to motivate them to take action in starting or increasing their current recycling and waste reduction practices. In 2014, Triangle provided 37 assemblies at 27 public and private schools reaching 10,074 teachers and students throughout Snohomish County.

The school-wide live assembly show is often the first and sometimes only point of contact with a school. It is designed to ignite school-wide interest in recycling and waste reduction, by taking students and staff on a fun and interactive adventure to learn:

- The importance of recycling and reducing waste.
- That garbage is sent to a landfill and sits there forever.
- Which natural resources are used to make everyday products.
- What can and cannot be recycled.
- Simple everyday actions to cut down on garbage.

To tailor the assembly to different cognitive levels, Triangle offers both primary (grades K-2) and intermediate (grades 3-6) versions of the show. In both versions actors entertain while presenting typical situations at home and at school. Students walk away understanding that recycling and waste reduction are important, and that they play a role at home and at school in preventing waste.

Students learn that garbage in Snohomish County is picked up by trucks and then transported by trains every day to a landfill in eastern Washington where it remains forever. They also learn about the natural resources used to make different everyday items. The Intermediate show provides additional information about the "upstream" resources that are used to make an item, and how throwing away items includes throwing away all the resources that went into producing and distributing those items. With that image in mind, students are then encouraged to take specific actions to reduce the amount of waste going to the landfill such as packing their lunch in reusable containers, using both sides of a piece of paper before recycling, and using a reusable water bottle. All attendees learn that many easily-recycled items are made into other useful products such as fleece clothing, carpets, and more.

Triangle made minor updates to the assembly script and props, and continued to provide schools with an assembly discussion guide that provides key vocabulary and facts, discussion questions, online resources, and age-appropriate activities for teachers to use with their classes both before and following the assembly. Teachers are encouraged to read through the discussion guide prior to the assembly and introduce the 4Rs to their students:

- **Rethink** what we purchase and use.
- **Reuse** materials in functional and creative ways.
- **Reduce** the amount of garbage we create and have to send to the landfill.
- **Recycle and compost** (when possible) appropriate materials at school and at home.

In the third year of the program, the assembly continued to receive excellent reviews and high evaluation marks. Students and teachers alike clearly left the assembly with a better understanding of what happens to their garbage, the importance of reducing waste, and how to properly recycle. Many teachers commented this year that the assembly prompted them to lead follow-up discussions and to take action in their classrooms.

The following teacher comments exemplify the assembly's value:

- *We loved the program. My students enjoyed the characters and the content. They were inspired to make some changes in our classroom and at home.*
- *Students loved this program. We discussed ways we can start using and doing the 4Rs at home.*

- *Excellent program! The Ks loved it! I love that the language and materials were for all elementary ages. Very relevant and visually friendly.*
- *I loved the program. The actors are fantastic and motivate the students. Concepts are fun and easy to remember from your songs and chants.*
- *I found the assembly to be hilarious! I feel the humor kept the students interested and focused. The content was easy to understand at this level.*

Classroom Workshops

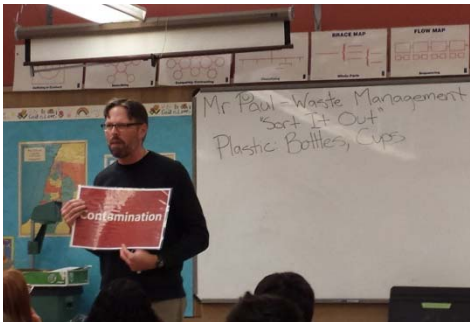
The goal of the classroom workshop component is to provide students and teachers with an opportunity for more in-depth learning about waste reduction and recycling. In 2014, Triangle presented 214 classroom workshops for 5,134 students and 214 teachers at 41 schools. Of the 41 schools, 30 were new to the program.

During 2014, the Triangle team revised and updated workshop scripts, marketing materials, student take home surveys, and materials. Three different workshops were offered in 2014:

- Habitat Connections (grades 2-3)
- Sort-It-Out (primary grades 2-3 and intermediate grades 4-5 versions)
- Landfill Laboratory (grades 4-6)

Table 2
Classroom Workshops

Workshop	Activity	# of Workshops	# of Students/ Teachers
Sort-It-Out (Grades 2-6)	Teaches students the concepts of waste reduction and recycling at home and in school. Students learn about natural resources through an activity that shows the life cycle of a piece of paper. Students also sort recyclables, play a fast-paced quiz game, and learn how to reduce contamination and improve recycling.	47	1,066
Habitat Connections (Grades 2-3)	Introduces students to the basic components of habitat – food, water, shelter, and space – through a variety of examples and hands-on activities. Students then make the connection between (1) their waste reduction and recycling actions, and (2) protecting the habitat of native Northwest animals. Students also sort recyclables and discuss the 4Rs.	79	1,909
Landfill Laboratory (Grades 4-6)	Explores with students what happens to the things we throw in the trash. Students learn where their garbage goes and, using inquiry-based activities, students "dig into" what a landfill is, the simple science of decomposition, and the importance of the 4Rs.	88	2,159
	TOTAL	**214**	5,348



The classroom workshops are designed to build on assembly messages and teach students in more detail where their garbage goes, the importance of the 4Rs, and how to properly recycle to avoid contamination. Sorting activities are designed to give them hands-on practice time, and they are encouraged to share the information with their families and peers. Through hands-on activities, critical thinking, and group games, students learn how their everyday actions lead to a more sustainable environment.

Each workshop extends the learning beyond the classroom walls by providing pre- and post-workshop activities. Pre-workshop activity sheets are given to Sort-It-Out participants and encourage students and their families to share questions they have about recycling. These questions are then brought back to school so that the presenter can review them before the workshop and incorporate answers into the program activities. Following each workshop, students receive a post-workshop home activity that teaches families how to properly recycle. In 2014, all family questions were tracked and sorted thematically (see appendix for complete list of questions).

Classroom workshops are developmentally age-appropriate and align with each grade level's classroom curriculum. All workshops support the Washington State Education Learning Standards and in 2014, Triangle began to incorporate the new Next Generation Science and Common Core Standards. Students are encouraged to ask questions, define problems, construct explanations and figure out solutions to our waste reduction challenges. By incorporating state learning requirements and STEM (Science, Technology, Engineering, and Math) concepts, the workshops support teachers and their classroom curriculum needs.

Post-workshop teacher surveys continue to show that workshops are engaging, worthwhile, and essential in strengthening students' understanding of waste reduction and recycling. When asked to provide feedback on the workshop, teacher responses strongly indicated that they felt that the workshop was applicable and offered concrete ideas for behavior change. When asked to share what aspects of the workshop were valuable, examples of responses included:

- *Teaching students at a young age to be thoughtful about being wasteful and offering real ways to make changes.*
- *Educating kids so they can go home and teach their families.*
- *Hands on activities really helped students make the connections of materials we use and what it affects.*
- *I was surprised by some of the misinformation students carried with them, but by the time they left, the instructor had given them oral assessments over the objectives he taught and it was evident that the students learned a lot about landfills, the "dead-end" issue, what and how to recycle, reduce, reuse, and rethink. Bravo for Waste Management!*

Technical Assistance

The goal of the technical assistance component is to support increased recycling and waste reduction in schools. This is accomplished by working individually with schools to help them assess their current WRR practices, create a plan for overall waste reduction, and establish a comprehensive, self-sustaining recycling program. In 2014, Triangle provided in-depth technical assistance to 23 schools in Snohomish County that have Waste Management as their current recycling hauler.

The technical assistance program consists of the following components:

- In-person site visits to gather baseline data and assess a school's waste practices.
- Providing up to $200 worth of bins to enhance recycling or food waste collection options.
- Providing recycling, garbage and/or food waste signs.
- On-going data collection and tracking of a school's recycling rate and waste reduction efforts.
- Creating resources such as the program's "Steps to Starting a Recycling Program in Your School" guide.
- On-going support via emails and phone calls to check on a program's progress and help troubleshoot problems.

Of the 23 schools that received technical assistance in 2014, seven of the schools were new to the program. The other 16 schools were provided continued assistance from the previous year, which included follow-up site visits, additional bins and signs as necessary, one-on-one conversations to help work through specific issues, or regular emails with resources and other recycling reminders. Technical assistance frequently builds on momentum from a school's participation in the assembly and classroom workshop, but some schools choose to start with technical assistance as a jumping off point, signing up for other program components afterward.

To ensure increased participation throughout the county, Triangle targeted initial outreach to new schools, who had not previously participated in the program. Triangle then reached out to provide continued support to schools that have participated previously. This continued assistance, past the school's initial establishing year, is essential, as it helps a school establish a sustainable recycling program. With strong roots and tools, comprehensive recycling eventually becomes an integral part of the school's infrastructure and culture, and the school needs less and less hands-on assistance from the Technical Assistance coordinator. In 2014, almost 95% of schools that were assisted in the previous year requested and received on-going assistance to expand upon their recycling programs.

In 2014, the Triangle team continued to communicate with district Resource Conservation Managers (RCMs) when appropriate. This collaboration served to both increase support for the Waste Management schools program and provide the RCM with the additional support they needed in meeting their district goals.

The breakdown of the 23 schools receiving technical assistance in 2014 is twenty elementary or K-12 schools, two middle schools, and one high school. Specific details of technical assistance visits and resources provided to schools are provided in Table 3 below.

Table 3
Technical Assistance

School Name	Assisted	# of Visits	# of Bins Delivered	# of Recycling Signs Delivered	Recycling Rates	
					Pre	Post
Arlington High School	Y	1	8	150	TBD	TBD
Brier Terrace Middle School	Y	3	7	50	47%	52%
Cedar Way Elementary	Y	1	12	105	40%	40%
Cedar Wood Elementary	Y	1	n/a	n/a	55%	55%
Cedarhome Elementary	Y	1	9	50	12%	TBD
College Place Elementary	Y	0	n/a	n/a	40%	49%
Discovery Elementary	Y	1	n/a	n/a	38%	60%
Edmonds Heights K-12	Y	1	12	50	35%	49%
Eisenhower Middle School	Y	0	n/a	n/a	n/a	n/a
Frank Wagner Elementary	Y	2	1	50	20%	TBD
Fryelands Elementary	Y	1	9	50	33%	56%
Hazelwood Elementary	Y	1	9	50	16%	41%
Little Cedars Elementary	Y	2	9	50	25%	42%
Maltby Elementary	Y	1	4	50	25%	TBD
Maplewood K-8	Y	1	n/a	50	20%	41%
Martha Lake Elementary	Y	0	n/a	n/a	27%	43%
Mukilteo Elementary	Y	0	n/a	50	15%	49%
Odyssey Elementary	Y	2	4	20	28%	42%
Stillaguamish Valley K-12	Y	0	n/a	n/a	n/a	n/a
Twin City Elementary	Y	1	n/a	n/a	27%	27%
Utsalady Elementary	Y	1	n/a	n/a	20%	TBD
Westgate Elementary	Y	0	n/a	n/a	50%	TBD
Zion Lutheran School	Y	0	n/a	n/a	15%	40%
TOTAL	**23**	**21**	**84**	**775**	**-**	**-**

Bolded text indicates schools that were new to the technical assistance program in 2014.

In 2014, Triangle calculated an average increase of 69% in recycling rates for schools that participated in the program. Some schools saw no changes in their recycling rates because they did not yet implement recycling even after bins and assistance were provided and/or the impact was not as measurably significant. In addition to pre- and post- recycling data, the Triangle team tracked the following information:

- Communication with an average of three staff members per school, via multiple emails and phone calls (in addition to tracked visits).
- An average of $199 per school on new bins and accessories (e.g. rolling bases).*
- An average of eight new recycling bins and accessories per school.*
- An average of 60 recycling signs per school.*

* Not all schools require bins, accessories or signs. These averages are based on the number of schools receiving materials, not on the total number of schools visited.

In response to recommendations from the previous year, in 2014 the Triangle team implemented a survey for the lead school staff person (such as a custodian, teacher or principal) that worked with the technical assistance coordinator. Based on the survey results, in-the-moment feedback, and follow-up emails, staff and students alike showed a high level of appreciation for Waste Management's free technical assistance program and appeared to find the operational and educational assistance both helpful and effective. Results from the technical assistance survey will be discussed in further detail in the evaluation section of this report, but representative comments include:

- *The assistance from Nanda has been HUGE!! She was able to work with the school and students to come up with an actual recycling plan that has been implemented and is still being used in both our breakfast and lunch programs. We also REALLY appreciated the beginning of the year recycle assembly that was provided.*
- *We are grateful for the assistance…It is so helpful to work with people who have done this before! It is difficult to change an environment, but we are doing it, one step at a time.*
- *Here is what I know; the program is 100% successful as of right now! (Love it!) We do have volunteer monitors that work most lunches and that really helps. To date we have not had to toss any of the recycling in the garbage dumpster due to contamination! Thank you for helping Little Cedars move closer to Green!!!*

Action Projects

The goal of the action project component of the program is to encourage schools to move from learning to action, and to support students in taking key leadership roles in enhancing the effectiveness of their schools' WRR practices. The Triangle team works with interested teachers and student groups to identify and implement projects that can have a positive impact on the school's recycling efforts. In 2014 Triangle worked with select student groups, referred to as Green Teams, to implement meaningful action projects at 11 schools.

Action project support typically consists of the following elements:

- Consultation with the school contacts on project ideas.
- In-person visit/s with the student Green Team group to brainstorm and help them create an action plan.
- Drafting a summary of an action plan and working with the school to create a timeline for implementation.
- On-going support via emails and phone calls to check on the team's progress, provide follow- up resources and help troubleshoot problems.
- Follow up in-person visits (as needed) for kick off events.

Green Team projects in 2014 ranged from lunchroom monitoring training and practice sessions, to creating PA announcements and posters, to recycling relay sorting games, to learning to lead family night outreach booths. All projects addressed creative ways for students to educate the rest of the school and their families. Green Team participants were provided with reusable water bottles and aprons for lunchroom waste station monitoring, as requested.

In 2014, Triangle documented the following Green Team actions:

- Conducted action planning and project-related meetings with 193 Green Team students.
- Distributed 50 "Waste Management Green Team" aprons to students that volunteered to be lunchroom monitors and help educate fellow students as they discarded their lunchtime waste.

Table 4 provides details for Green Team projects per school.

Table 4 Green Teams		
School Name	**Project Description**	**# of Students**
Brier Terrace Middle School	Met with Green Team members and head custodian; reviewed contamination levels in lunchroom and discussed how to move forward with getting all cans, bottles and milk cartons into the recycling bins. Students made announcements, educated school community, and worked to get larger recycling bins in the library.	7
Cedar Way Elementary	Discussed school-outreach action plan. Provided aprons to 4th grade Green Team. Students took on lunchroom monitoring as well as creating school-wide educational announcements and a recycling video.	15
College Place Elementary	Worked with 4th grade students to review recycling basics through an interactive recycling relay. Trained lunchroom monitors and role-played and hosted Q&A session to address confusion.	9
Edmonds Heights K-12	Helped school develop a Green Team. Worked on creating customized 3D posters to hang above new recycling bins in the lunchroom.	5
Hazelwood Elementary	Discussed school-outreach action plan. Trained students to become lunchroom monitors and guided students as they created customized 3D posters to hang above new recycling bins in the lunchroom.	31
Little Cedars Elementary	Trained students to become lunchroom monitors and guided students as they created customized 3D posters to hang above new recycling bins in the lunchroom.	18
Maltby Elementary	Worked with a large group of students on recycling basics and related activities: recycling relay, lunchroom monitoring practice, and Q&A session. Began conversation about creating customized 3D posters to be displayed throughout the school.	40
Maplewood K-8	Provided aprons to student Green Team. Discussed school-outreach action plan (all set to become "recycling champions" for the school).	4
Monroe Elementary	Trained students to become lunchroom monitors and guided students as they created customized 3D posters to hang above their current recycling and compost bins in the lunchroom.	25
Odyssey Elementary	Provided aprons to the already-established student Green Team to use when monitoring recycling in the lunchroom. Provided feedback to principal on the 3D posters she created herself.	15
Utsalady Elementary	Provided aprons to the already-established student Green Team to use when monitoring recycling in the lunchroom. Discussed school-outreach action plan. Provided feedback to the principal and her Green Team students on the 3D posters they created for the lunchroom.	24
	TOTAL	**193**

Based on recommendations from the previous year, the Triangle team created an online survey for Green Team staff who had received active assistance throughout the year. The survey was emailed to all active Green Team contacts in December 2014. The response was limited to two teachers, due perhaps to the time of year and to many of the projects still being in process. Of the two survey responses, both Green Team leaders expressed appreciation for the program and indicated that they found it valuable. Their responses and other typical email responses are included here:

- *Things are going fantastic! We are so grateful for you sharing and helping us start our green team and couldn't be more excited!*
- *[The Green Team program] strongly reinforced concepts and motivated students to continue as Green Team members.*
- *We appreciate this support for our ongoing efforts to help students and staff think green.*
- *Suggestions: make it more known that this is available and can be used in classes. Love your program! Thank-you.*
- *Students are excited to see the levels of garbage going down, and the recycling bins filled up instead!*

Family Outreach

The family outreach task was new in 2014 and was developed with the goal of increasing connections between what students are learning about waste reduction and recycling at school and what they are sharing about these topics with their families at home. The Triangle team worked with schools they had already connected with through the technical assistance and project assistance tasks to incorporate a new "recycling education booth" at six school-sponsored family events, (e.g. Curriculum Nights, Family Learning Nights, Environmental Fairs, etc.).

Prior to each event, the Triangle team worked with student Green Teams to coordinate roles and responsibilities. At the family outreach events, whenever possible, Green Team students themselves were the primary vehicles for family learning. They explained the recycling rules and helped answer questions as appropriate. At each event, Triangle staff served as the expert resource for families and worked closely with the Green Team students to facilitate the activities. Triangle also used these events as opportunities to learn what questions families still have about recycling. Questions and responses were recorded and addressed as appropriate in subsequent school assistance activities.

Triangle developed a highly interactive family night "kit" that contained materials to engage families in multiple ways. The kit, which was incorporated into each of the six events, contained the following:

- *Sorting Activity Game* to give families hands-on practice with how to properly sort waste and decrease contamination in the recycling bins.
- *Buzzer Box Quiz Show* designed to have families compete against each other or other families using their knowledge of waste reduction and recycling. Families answer scenario questions that focus on choices people make about using or consuming products at home or school.
- *Recycling Twister Game* for participants to have fun as they think about how to apply the 4Rs to their everyday actions.
- *4Rs Velcro Board* for participants to quickly place the 4Rs in order on the 4Rs Velcro Board, thinking specifically about why an order exists and how to sequentially implement the 4Rs into their daily lives.
- *4Rs Flip Book* designed with questions and answers to help participants think about the 4Rs.

The following handouts, displays, and giveaways were also provided for each family outreach event:

- *Prizes:*
    - BPA-free water bottles made from recycled materials.
    - Waste Management "Closing the Loop" bracelets made from recycled silicone.
    - Waste Management pencils made from recycled newspapers.
- *Home Surveys* created for the classroom workshop component of the 2014 program provide take-home information for event attendees to prompt discussion about their current recycling methods and areas for improvement.
- *Snohomish County Residential Recycling Guides*, an informative take-home item that families can use as a reference for sorting recyclables at home.
- *Project Idea Sheets*, a reference guide that lists specific ideas that students and families can do to implement waste reduction and recycling in their homes, schools, classrooms, and lunchrooms.
- *4Rs Coloring Pages and Activity Booklet*, an interactive booklet for primary school-aged children to work on at the table or take home. Crayons are provided at the table.
- *School Success Display*, customized for each school with the recycling rate of the school both before and after they started a school-wide recycling program, which highlights specific successes of each individual school and is a source of pride for the Green Team members.
- *"Our School Recycles"* table display sign.

In 2014, the Triangle team staffed six family outreach events, reaching over 470 students and their family members. Estimated numbers of attendees reached and materials distributed at each event are outlined in Table 5 below.

Table 5 Family Outreach				
School Name	**Event Name**	**# of Estimated Attendees Visiting Booth**	**# of Water Bottles Distributed**	**# of Bracelets Distributed**
Discovery Elementary	Family Learning Night	75	27	n/a
Edmonds Elementary	Science Expo	75	15	20
Hazelwood Elementary	Family Open House	100	30	25
Maplewood K-8	Maplewood Madness	75	30	20
Mukilteo Elementary	Holiday Store	76	12	28
Zion Lutheran School	Fall Festival	70	0	36
TOTAL		**471**	**114**	**129**

One parent volunteer event coordinator emailed the following positive feedback for the program:

- *What can I say? You were fantastic last night with those kids! You kept them thinking and engaged the entire time, it was wonderful! Thank you so much, I so appreciate you coming and spending your time and energy with us.*

Evaluation Results

In 2014, Triangle implemented the same measures to evaluate the effectiveness of the assembly and classroom workshop program that were used previously. Technical assistance and action project feedback forms were added this year. Evaluation instruments include the following:

- Assembly student pre- and post-tests to measure student learning
- Assembly teacher feedback survey to measure effectiveness and teacher satisfaction
- Workshop teacher evaluation form to measure workshop effectiveness and satisfaction
- Technical Assistance feedback form to assess effectiveness and gain anecdotal feedback
- Action Project online survey form to capture qualitative comments and assess effectiveness

In 2014, 180 students completed the student pre- and post-tests, 104 teachers completed the assembly evaluation survey, and 186 teachers completed the workshop evaluation.

Student Knowledge Assessment

The Waste Management assembly program was performed for elementary students from grades kindergarten through five, with a small number of sixth grades and one seventh grade class attending one performance. Classrooms participating in the knowledge assessment portion of this evaluation were limited to grades three through five because pre- and post-tests are self-administered and require sufficient reading and writing skills (sixth and seventh grade classes were not tested because they are not the primary target audience for this program). A total of 180 students were tested before (pre-test) and after (post-test) the assembly presentation to assess changes in their understanding of the WRR concepts presented. The 2014 sample size was somewhat smaller because the tests were only administered to students who had never seen the assembly, and not to those who had seen it years prior. While this size sample does not allow estimation of population percentages, it helps to illustrate whether the learning trends observed over the last two years continued. Students were drawn from nine different elementary schools to help ensure representation from across Waste Management's UTC code service area.

Table 6 shows the grade levels for elementary students participating in this year's evaluation.

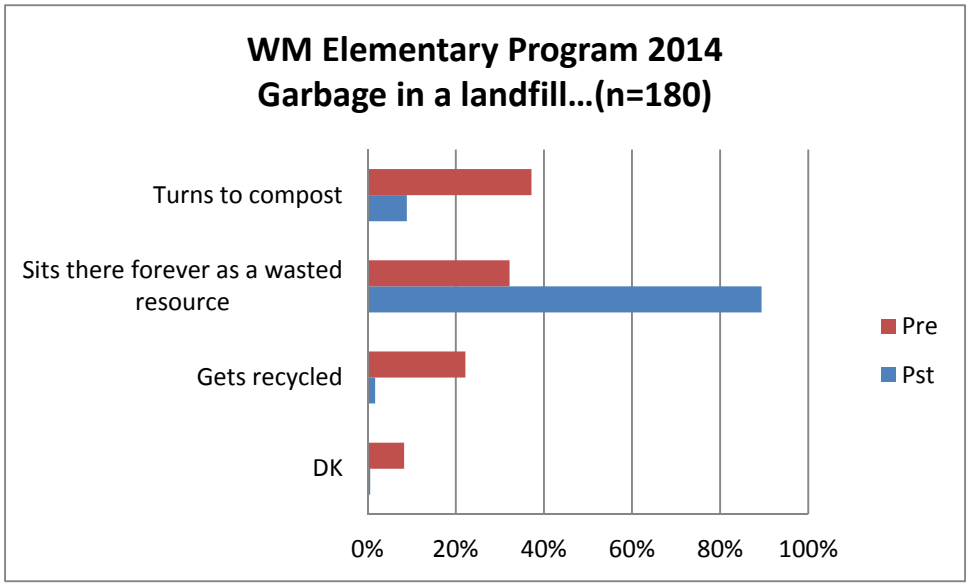
Table 6
Grade Distribution of Elementary Student Respondents
(n=180)

Grade Level	% of Respondents
3	45.6%
4	54.4%

This year's student participants are fairly evenly split between third grade (46%) and fourth grade (54%) students. This differs from last year when approximately one-quarter of students were in the fourth grade and one-quarter from the fifth grade.

The elementary evaluation instrument is used to assess student understanding of the most important WRR concepts covered in the assembly. The pre-and post-tests ask students about 1) what happens to garbage when it goes to a landfill, 2) the natural resources that go into pop cans, plastic bottles and cardboard, 3) items that can go into a home recycling bin, 4) best choices for saving natural resources, and 5) things that students and their families can do to make less garbage. Identical questions were asked before (pre-test) and after (post-test) the assembly presentation. Increases in correct responses are likely attributed to student learning as a result of the assembly presentation. A copy of the elementary instrument is included in the appendix. Each question and a summary of student responses are below. Correct answers are indicated in **bold**.

Table 7 Q1: When garbage goes to a landfill, it… (n=180)		
	Pre-test % of Students	Post-test % of Students
Turns to compost	37.2%	8.9%
Sits there forever as a wasted resource	**32.2%**	**89.4%**
Gets recycled	22.2%	1.7%
Don't know	8.3%	0.6%



As was observed last year, Table 7 results show students clearly learn from the assembly that when garbage goes to a landfill it *sits there forever as a wasted resource*. Prior to the assembly, just over thirty percent (32 percent) of students chose the correct option of *sits there forever as a wasted resource*, with the greatest number (37 percent) thinking it *turns to compost*. As shown, students moved from 32 to 89 percent correct responses, a very large increase in understanding for this concept. This result is similar to last year's, when students moved from 29 to 87 percent correct responses, showing consistency in learning from year to year.

The next question presents students with a list of three common packaging items – pop cans, plastic bottles, and cardboard – and four natural resources that might go into making each item – trees, oil, metal, and water. The correct natural resource choices for each packaging item is shown in **bold**.

Table 8 outlines students' responses and indicates percentages of correct responses for each item.

Table 8 Q2: The things we use are made from natural resources. Circle all the natural resources that are used to make each thing on the list. (n=180)		
Pop cans	Pre-test % of Students	Post-test % of Students
Trees	5.0%	5.0%
Oil	6.1%	20.0%
Metal	**68.3%**	**81.1%**
Water	**6.7%**	**27.2%**
Don't know	12.8%	4.4%
Plastic bottles	Pre-test % of Students	Post-test % of Students
Trees	18.3%	27.2%
Oil	**25.0%**	**53.3%**
Metal	6.7%	2.8%
Water	**15.6%**	**40.0%**
Don't know	33.3%	7.2%
Cardboard	Pre-test % of Students	Post-test % of Students
Trees	**71.7%**	**81.1%**
Oil	3.9%	11.7%
Metal	3.3%	1.7%
Water	3.9%	23.3%
Don't know	10.6%	6.1%

Table 8 results indicate that after the assembly students became better able to identify the natural resources used to manufacture *pop cans*, *plastic bottles* and *cardboard*. For *pop cans*, students show a sizeable increase in identifying *water* as an essential manufacturing resource with a gain of 20 percent. Students show a small gain in identifying *metal* (68 percent to 81percent), but students' high level of awareness prior to the assembly likely limits this increase. It is interesting that after the assembly a number of students (20 percent) consider *oil* as an essential component in pop cans' manufacture. A similar pattern occurred over the last two years, and may be due to confusion over which of the three types of packaging requires oil in its manufacture. For *plastic bottles*, students clearly learn that *oil* and *water* are necessary, with gains of 28 and 25 percent, respectively. Finally, for cardboard, students realize a 20 percent gain in recognizing *water* as a key component and move from a high level of understanding at 72 percent for the natural resource, *trees,* to an even higher 81 percent after the assembly. These findings are similar to last year's.

Another key message for elementary students is identifying items that are appropriate for their home recycling bins. Students were presented with a list of containers and wrappers and asked to circle the ones that could be recycled. Their percentage of correct responses, grouped by recyclable and non-recyclable items, are presented in Table 9.

Table 9
Q3: Put a circle around all the things that can be recycled in your HOME recycling bin.
(n=180)

Recyclable items sorted correctly		
Item	Pre-test % of Students	Post-test % of Students
Plastic bottle	89.4%	84.4%
Pop can	79.4%	82.2%
Newspaper	73.9%	80.6%
Tin can	73.9%	77.8%
Cardboard	70.0%	77.2%
Paper	72.2%	76.4%
Yogurt container	63.3%	62.2%
Glass jar	38.3%	55.5%
Non-recyclable items sorted correctly		
Item	Pre-test % of Students	Post-test % of Students
Pencils/pens	83.3%	79.4%
Chip bags	67.2%	76.1%
Plastic sandwich wrap	65.5%	72.2%
Capri Sun juice pouch	57.8%	70.6%
Paper towel	64.4%	56.1%

Table 9 above show changes in students' understanding of items that are recyclable or non-recyclable. For example, *plastic bottles* are recyclable and 89 percent of students correctly identified this at pre-test and 84 percent at post-test. Similarly, *pens/pencils* are non-recyclable, and 83 percent of students correctly categorized them at pre-test and with 79 percent at post-test. Of the remaining seven recyclable items (*paper, newspaper, pop can, cardboard, tin can, yogurt container, glass jar*), five –*pop can, newspaper, tin can, cardboard,* and *paper* - show modest gains of three to seven percent improvement after the assembly. Post-test scores for these five items range between 76 and 82 percent of correctly sorted recyclable items. The recyclable item *yogurt container* shows a negligible change from 63 to 62 percent. The final recyclable item, *glass jar*,

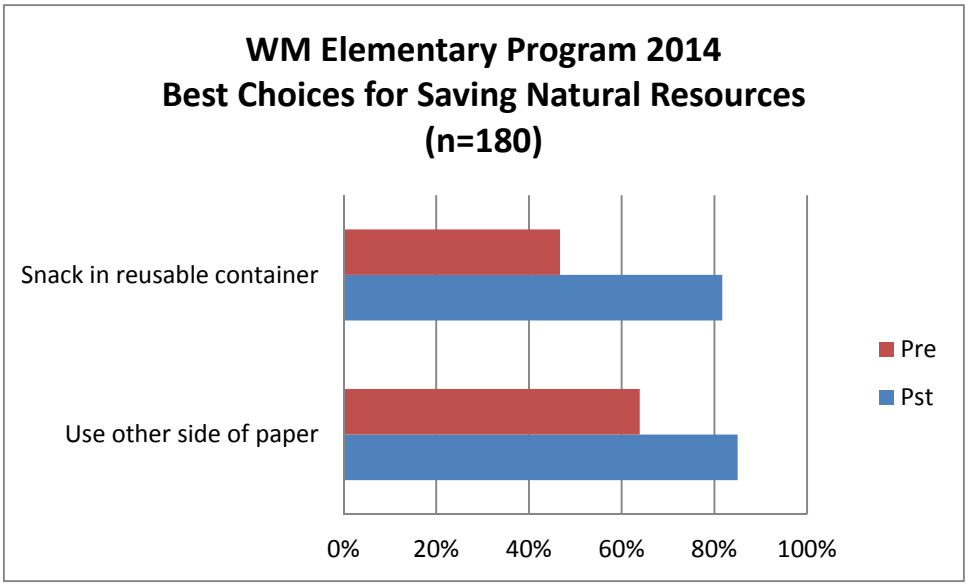
shows the largest improvement at 17 percent. Just over one-half to two-thirds of the students correctly identified these last two items as recyclable after the assembly, indicating there is still some confusion among students about their proper placement in the recycle bin.

Of the five non-recyclable items (*pencils/pens, plastic sandwich wrap, chip bags, Capri Sun juice pouch, paper towel*), *chip bags, plastic sandwich wrap* and *Capri Sun juice pouch* show improvement with between seven and 13 percent improvement in identifying them as non-recyclables. **It is interesting to note that these items are called out specifically in the assembly as being non-recyclable and this identification seems to help students keep them out of the recycle bin.** The two remaining items are relatively unchanged from pre-test to post-test, though approximately 80 percent of students could correctly identify *pens/pencils* as non-recyclable even before the assembly presentation. Students appear to be unclear that the item *paper towel* is non-recyclable. This is likely due to the fact that the composting and yard waste containers are very minor messages in the assembly.

The next question posed to students asks about two everyday activities where they have the opportunity to save natural resources. Students were asked to identify the best choice for each. The question and student responses follow. The correct response is shown in **bold**.

Table 10
Q4: If you want to save natural resources, check the best choice in each group.
(n=180)

You are packing a snack for school.	Pre-test % of Students	Post-test % of Students
Put it in a plastic bag that you can throw away	18.5%	6.7%
Put it in a reusable container	**47.2%**	**81.7%**
Put it in a paper bag and recycle when done	27.0%	9.4%
Don't know	7.3%	2.8%
You are done with your spelling paper.	**Pre-test % of Students**	**Post-test % of Students**
Put it in the recycle bin	28.4%	10.8%
Throw it in the garbage	1.7%	1.1%
Save it to reuse the other side	**65.3%**	**86.9%**
Don't know	4.5%	1.1%



In responding to the questions on best choices to save natural resources, students clearly learn their best choice is to pack a snack in a reusable container (47 percent pre, 82 percent post) and to use the back side of a piece of paper before recycling it (65 percent pre, 87 percent post). Both of these choices emphasize *reuse* options before students choose to recycle or dispose of an item.

In a final pre-and post-test question, students were presented with an open-ended question and asked to: *List three things you or your family could do to make less garbage*. Table 11 displays student responses to the question before and after the assembly, grouped into thematic categories.

Table 11
Q5: List three things you or your family could do to make less garbage.
(n=180)

Action	Pre-test % of Student	Post-test % of Students
Choose reusables	30.2%	39.3%
Recycle/recycle more	17.2%	19.8%
Buy/waste less	6.5%	6.5%
Use proper disposal practices	6.1%	4.4%
Compost/yard waste	4.6%	3.3%
Earth friendly practices	3.3%	1.9%
Reduce, 4Rs	0.9%	4.8%
Don't know	35.7%	22.0%

The most frequent responses were *choose reusables* (30 percent, 39 percent), *recycle/recycle more* (17 percent, 20 percent), and *buy/waste less* (7 percent, 7 percent). Student responses changed modestly after the assembly, with the *choose reusables* category showing the **largest change at 9 percent, followed by a 3 percent increase for *recycle/recycle more*.** These response categories were followed by relatively small numbers of students reporting *buy/waste less* (7 percent, 7 percent), *use proper disposal practices* (6 percent, 4 percent), use *earth friendly practices* (3 percent, 2 percent), *composting/using a yard waste bin* (5 percent, 3 percent), and *reduce or 4Rs* (1 percent, 5 percent). Again, these categories were relatively unchanged from pre-test to post-test. If students could not think of anything they or their families could do to make less garbage, they were instructed to write *Don't know*. The percentage of students that chose this response moved from 36 percent at pre-test to 22 percent after the assembly, indicating students had become better able to identify ways to reduce waste. Examples of typical student responses to each of the categories in Table 11 follow.

Reuse/choose reusable items

- *reuse things like water bottles*
- *save plastic bags*
- *save it and reuse it*
- *use both sides of paper*
- *you could use a reusable bowl*

Recycle/Recycle more

- *recycle more and more*
- *put cardboard in the recycle*
- *recycle everything we can*
- *have recycling bins*
- *recycle news*

Composting/using a yard waste bin

- *make a compost bin*
- *make into soil*
- *have a compost bin*

Use proper disposal practices

- *to throw the garbage where it goes*
- *put the right things in the right container*
- *pay attention to what we put in the garbage*

Buy/waste less

- *don't buy so much stuff*
- *if food, eat it all up*
- *don't print unuseful things*
- *use what we have*
- *don't be wasteful*

Use earth friendly practices

- *don't cut down trees*
- *clean up the earth*
- *save natural resources*
- *if you find trash on the ground clean it up*
- *not littering*

4Rs and reduce combinations

- *we could stop putting so many things in the garbage*
- *use the 4Rs*
- *recycle and rethink*
- *rethink*
- *the 4Rs, rethink, reduce, reuse, recycle*

Teacher Satisfaction Survey Results

In addition to student testing, elementary educators were asked to complete a survey to determine their satisfaction with the assembly presentation. The grades taught by educators participating in the elementary assembly evaluation are displayed in the table below. Teachers taught kindergarten through grade 7, with the greatest number of respondents teaching grades 1-2 (23 percent) and grades 3-4 (48 percent). Smaller percentages taught kindergarten (11 percent), grades 5-6 (11 percent) and an *Other* category (9 percent) including mixed grades, specialists (e.g., library, music, administration) and those not reporting. These figures are presented in the following table.

Table 12
Grade Taught by Elementary Teacher Respondents
(n=104)

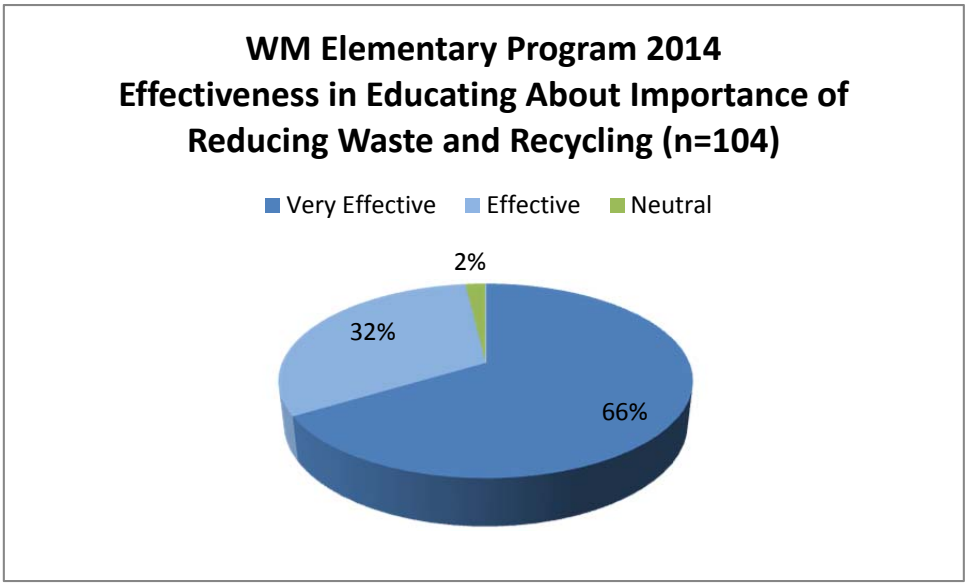
Grade Level	% of Respondents
Kindergarten	9%
1-2	23%
3-4	48%
5-6	11%
Other	9%

Measures of Assembly Effectiveness

Elementary teachers were asked to provide feedback on their overall impression of the elementary assembly. They were asked to *Rate the effectiveness of this assembly in educating your students about the importance of reducing waste and recycling* using a five-point scale, ranging from *Very effective* to *Not at all effective*. The results of this rating are shown in Table 13. A pie chart illustrating the ratings also follows.

Table 13
Effectiveness in Education About Importance of Reducing Waste and Recycling
(n=104)

Overall Effectiveness	% of Respondents
Very effective	66.3%
Effective	31.7%
Neutral	1.9%
Not effective	0%
Not at all effective	0%



As Table 13 and the accompanying chart show, teachers rated the assembly as being highly effective in educating students about the *importance* of reducing waste and recycling. Two-thirds (66 percent) rate it as *Very effective*, with 32 percent rating it as *Effective*, and only two percent rating it as *Neutral*. No teachers assigned ratings of *Not effective* or *Not at all effective*.

In a similar question, teachers viewing the assembly were asked to rate the *effectiveness of this assembly in educating your students about how to reduce, reuse and recycle.* Again, teachers were asked to use a five-point scale, ranging from *Very effective* to *Not at all effective*. The results of this rating are shown in Table 14. A pie chart illustrating the ratings also follows.

Table 14
Effectiveness in Education About How to Reduce, Reuse and Recycle
(n=104)

Overall Effectiveness	% of Respondents
Very effective	66.3%
Effective	29.8%
Neutral	3.8%
Not effective	0%
Not at all effective	0%

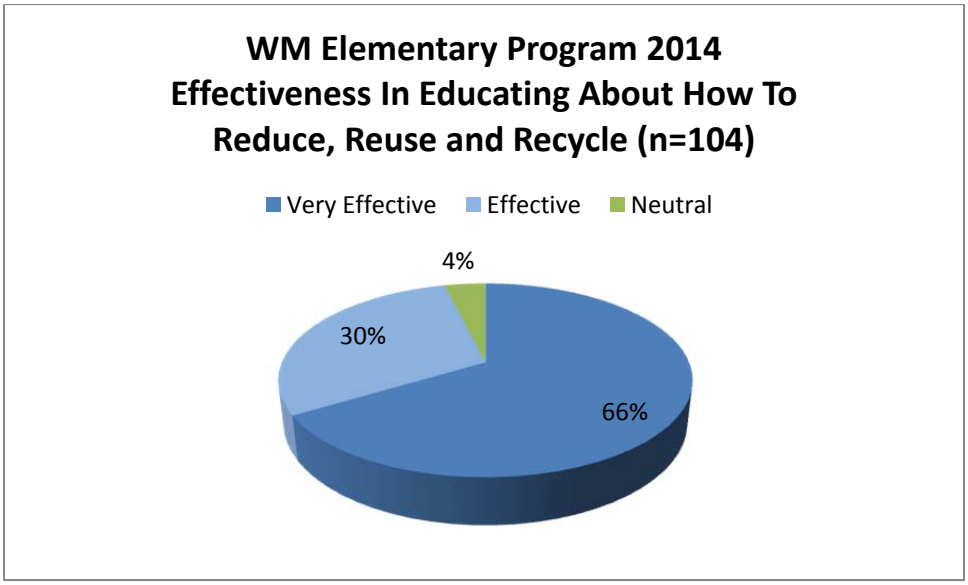


Table 14 and its accompanying chart show teachers find the assembly highly effective at educating students about *how* to reduce, reuse, and recycle. Sixty-six percent rate it as *Very effective*, with 30 percent rating it as *Effective*, and just four percent rating it as *Neutral*. No teachers assigned ratings of *Not effective* or *Not at all effective* to this dimension.

The assembly presentation often acts as a catalyst for classroom activities that build upon the assembly's message to reduce, reuse, and recycle. Teachers were presented with a list of possible activities and asked to identify any that their classroom undertook post-assembly. Each of these activities follows, with the percentage of teachers selecting each item indicated.

- Improved ongoing classroom recycling –73.1 percent
- Prompted classroom discussion on recycling/waste reduction –65.4 percent
- Set up a reuse box –43.3 percent
- Reduced waste in the classroom –31.7 percent
- Started to do classroom recycling –14.4 percent
- Inspired class to do a waste reduction or recycling project –12.5 percent

As the list shows, teachers' top two choices of activities were *improved ongoing classroom recycling* (73%) and *prompted classroom discussions* (65%). These levels of activity are very similar to those observed last year (76%, 75%, respectively). Next, *set up a reuse box* (43%), and *reduced waste in the classroom* (31%) were mentioned most frequently. The two final items on the list, *started to do classroom recycling* (14%) and *inspired class to do a waste reduction or recycling project* (13%), were chosen by a small percentage of teachers. In addition to these activities, teachers could also list "other" activities their classrooms did as a result of the program. Responses included:

- *Reduced waste at lunchtime - know what to recycle, what is garbage*
- *Reviewed class recycling program*
- *(Used) the recycling and reusing methods*

In a final question, elementary teachers were asked to make comments or suggestions regarding the assembly program. The vast majority of teachers' comments were positive and complimentary. A number of teachers also made suggestions for improvements. Representative comments in each area are listed below. See the appendix for a complete list of all teacher comments.

General positive comments

- *It was great! First graders were engaged and came back excited about recycling.*
- *Love the set! Loved your program! My second time viewing and it is as engaging and informative as the first experience. Actors are amazing and our students benefit from the thorough presentation and being able to interact!*
- *I thought the assembly was engaging and informative for both the students and teachers.*
- *Students made extra efforts to recycle at lunch.*
- *Students loved this program. We discussed ways we can start using and doing the 4Rs at home.*
- *Excellent performances - very engaging for the students and educationally inspiring.*
- *Really kept students attention. Made it fun, even I learned something.*
- *Students were engaged and enthusiastic. It reinforces our "Green Team" efforts.*
- *Love it! Kids were very engaged. Way to motivate the kids!*
- *Program was very well done and it was a fun and effective way to bring attention to an important issue.*
- *I like that it was interactive and fun. The kids were engaged in the presentation as they were learning.*

- *All the characters kept the message fresh and my students were very engaged.*
- *We loved the program. My students enjoyed the characters and the content. They were inspired to make some changes in our classroom and at home.*
- *I thought this assembly was entertaining, informative and inspired great conversations in my classroom.*
- *I found the assembly to be hilarious! I feel the humor kept the students interested and focused. The content was easy to understand at this level.*
- *I loved the program. The actors are fantastic and motivate the students. Concepts are fun and easy to remember from your songs and chants.*

Suggestions for improvement

- *Maybe set up expectations for talking, laughing before beginning, sometimes students were too noisy to hear actors.*
- *With such a high percentage of ELL students, it was hard for them to follow accent of actors and speed.*

- *Could they wear a small microphone? The kids loved the humor.*
- *Entertaining but felt a little more appropriate for primary grades.*
- *Major issue is the City of Marysville only provides us with paper and cardboard recycling.*
- *Appreciate the discussion guide, ideas to use for the classroom. Could a "take home" component be added to extend learning?*
- *I thought it was great but maybe a tiny bit long.*

Measures of Workshop Effectiveness

Teachers whose classrooms participated in workshops after the assembly presentation were asked to complete an online survey to determine the effectiveness of the workshop presentations. A total of 186 teachers completed workshop surveys, though 18 surveys were turned in after the date of analysis. Of the 168 surveys analyzed for this report, approximately one-quarter teach first or second grade (26 percent), nearly one-quarter teach third grade (24 percent), nearly thirty percent teach fourth grade, and 20 percent teach fifth through eighth grades (one percent of teachers did not report their grade level). Class sizes ranged from a low of 13 to a high of 52, with an average class size of 25. As for types of classroom workshops, 54 of the reporting teachers' classrooms participated in the *Landfill Laboratory* workshop, 54 in *Habitat Connections*, and 38 in *Sort-It-Out*. The remaining 22 teachers did not report a workshop.

Teachers were presented with a series of statements regarding their satisfaction with various aspects of the workshop and asked to rate their agreement on a five point scale ranging from *Strongly Agree* to *Strongly Disagree*. The results are presented in the following table.

Table 15
Waste Management Classroom Workshop Teacher Satisfaction
(n=168)

Statement	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Grade level appropriate	89%	10%	1%	0%	0%
Would recommend to other teachers	89%	10%	1%	0%	0%
Effective teaching strategies	89%	9%	1%	1%	0%
Interesting for the students	88%	11%	1%	0%	0%
Enhanced student understanding	86%	13%	1%	0%	0%
Appropriate time	85%	14%	0%	1%	0%
Prompted students to teach others	70%	28%	2%	0%	0%
Works well with curriculum	64%	29%	7%	0%	0%

Teachers express a high level of satisfaction with the classroom workshops, with 99 percent *agreeing* that the workshop was *appropriate for the grade level,* that that they would *recommend the workshop to other teachers*, that *the instructor used effective teaching strategies*, that it was *interesting for the students,* that it *enhanced student understanding* of waste reduction and recycling, and that an *appropriate amount of time* was allotted. Approximately 93 to 98 percent of teachers *agree* the workshop *prompted students to teach others* and that the workshop contents *work well with existing curriculum.*

In a final series of open-ended questions, teachers were asked to comment on what they felt were the most valuable aspects of the workshops. Representative comments follow.

- *The connection to our ecosystems and the human impact on the ecosystem.*
- *Connecting students interests in animals and their habitats to the daily choices students make.*
- *Teaching the importance of conservation and the 3Rs and how it impacts our environment and particularly our wildlife.*
- *Educating kids so they can go home and teach their families.*
- *Good visuals! Good interactive activities. I loved the sorting activity at the end.*
- *Teaching style kept the students engaged. She taught using various techniques for different learning styles.*
- *Students greatly enjoyed making predictions and observations of products decomposing.*
- *Teaching students at a young age to be thoughtful about being wasteful and offering real ways to make changes.*
- *We have been the lead class for composting programs here at school. This really reinforced for the students the importance of their jobs as composting ambassadors.*
- *Getting kids aware of the life of trash and that some things take "forever" to decompose.*
- *Pictures, engaging activities made students aware of what they could have recycled.*

Teachers were also asked about suggestions for improvements to the workshops. Selected comments follow:

- *Add another interactive activity.*
- *Info on more resources to teach this valuable info (websites, handouts, etc.).*
- *DVD to watch about nature when it is good/right and when habitat gets polluted or taken away.*
- *More student talk time.*
- *Having visual, possibly tactile parts for kids to interact with to model the landfill. Also pictures of parks that used to be landfills would be nice.*

Technical Assistance Effectiveness

In 2014 a new survey was emailed to main contacts at all schools receiving hands-on technical assistance. Responses were received from 11 school staff. A complete list of answers to all questions is included in the attached appendix, and the following are the list survey questions with *samples* of typical responses:

Q1: Has this assistance been helpful in getting students and staff to recycle more throughout the school? 11 responses received and 100 percent responded *YES*

- *Yes – the support… was fantastic. Without her help/suggestions/tips, it would have been extremely difficult to make the progress at our school.*
- *The assistance from Nanda has been HUGE!! She was able to work with the school and students to come up with an actual recycling plan that has been implemented and is still being used in both our breakfast and lunch programs. We also REALLY appreciated the beginning of the year recycle assembly that was provided.*
- *Very helpful, we are seeing a great increase in recycling.*
- *The assistance was helpful. We knew we could do more with the recycling, and it seems that should be part of the education we offer. The whole staff agreed and we have all put in our part.*

Q2: What was the most positive/effective aspect of this assistance? 11 responses received

- *The in-person assistance from the Waste Management representative*
- *Signs and bins*
- *Ideas and support resources from an expert*
- *The change in garbage/recycling practices at our school now*

Q3: Please share any suggestions for how to improve our assistance (i.e. are there any other resources that you would find useful, more or less communication from program staff, etc.?) 10 responses received

- *It would be great to find a way to THANK the custodian. By chance do you have funds to purchase t-shirts, sweatshirts, jackets, and/or hats for the school custodian?*
- *If you have positive information and reasons why we should recycle, that could help.*
- *I would like to know how other schools are doing their programs so we can improve our collections and build student awareness and leadership in this.*
- *I truly have no suggestions for how to improve your assistance. We felt very supported and this really helped us to put in place a program.*

Q4: Would you recommend this assistance program to other schools? 11 responses received and 100 percent responded YES

- *The program is so positive; I can't imagine a school who would turn it down.*
- *More than we could have hoped for.*
- *I would recommend Nanda and your recycling program to other schools.*

Q5: Any other comments: 7 responses received

- *Thank you for having this program in place. Without it… I'm not sure if I would have figured out how to get the recycling up and running in the school. Nanda was patient, kind, and very informative. Thank you for all the help!!!*
- *Thanks to your assistance, We have close to 95% student participation and are VERY hopeful that as these kids reach Middle School and High School and other things become important in their lives they will still practice what we all did together when they were here.*

Based on the sample size, this survey feedback was not analyzed for statistical significance. However, the survey responses along with anecdotal emails from schools provide valuable feedback and demonstrate the value of this program component. Administrative and custodial staff was unanimous in their estimation that the technical assistance was valuable to their schools and would likely be of value to other schools. They also noted specific examples of how the technical assistance aided their schools.

Action Project Effectiveness

In 2014, Triangle developed an online feedback form for Green Team action project contacts. The survey was emailed to the eight active schools contacts. It included the following six questions. The first three questions asked contacts to rate on a five-point scale from *Strongly Agree* to *Strongly Disagree*, and the last three questions were open ended.

1. The Green Team Assistance Program taught my students what can and cannot be recycled at school.
2. The Green Team Assistance Program outlined the importance of waste reduction and recycling.
3. The Green Team Assistance Program motivated my Green Team students to teach the school community on what can and cannot be recycled at school.
4. What was the most helpful part of the Green Team Assistance Program?
5. What was the least helpful part of the Green Team Assistance Program?
6. Please share any additional comments or suggestions you have regarding the Green Team Assistance Program.

Two responses were received and both answered *strongly agree* to all scaled questions. Sample survey and email responses are below (please see the appendix for a complete list of responses).

- *The (Action Project) assistance has been very helpful. She provided great options and suggestions to improve our program and make it more accessible.*
- *We loved having a representative from Waste Management. Very knowledgeable and helpful.*
- *The (Green Team assistance)* strongly reinforced concepts and motivated students to continue as Green Team members.

Discussion

In reviewing the goals of the overall program as well as each program component, several aspects of these evaluation results are notable. One overall program goal is to motivate behavior change and encourage students to take what they learned home to their families. Speaking to the success of this program, more than 70 percent of teachers reported that as a result of the assembly they took action to improve classroom recycling, and 98 percent of teachers agreed that classroom workshops prompted students to teach others what they had learned.

Additionally, student results from testing before and after the assembly presentation indicate student improvements in understanding remain stable from last year to this year. This is especially noteworthy given that this year's student sample is considerably smaller than last year. Across the past three years, students continue to show improvement in recognizing that the waste in a landfill sits there forever as a wasted resource. A key message in the assembly is to rethink, reduce and reuse *before* recycling. Results show that students clearly understand the importance of the order of the 4Rs and specifically of reuse in their daily activities. They also show steady improvement in recognizing the natural resources used in the manufacturing of cardboard, bottles, and cans. Each of the knowledge items tested with assembly participants show consistent gains across the last three years of this program.

Students' ability to sort recyclable and non-recyclable items approaches over 80 percent correct for most items, although the gains in specific sorting knowledge from the assembly are more modest. The amount of time in the assembly that is allocated to demonstrating sorting recyclables is minimal. The size and hands-on nature of the classroom workshops allow for more significant increases in student learning in this area.

Teachers' ratings of the effectiveness of the assembly presentation also show consistently high levels of satisfaction across the past three years. In 2014, nearly all teachers rated the assembly as *effective*, with over two-thirds assigning the highest possible rating of *very effective*. This year's satisfaction ratings for classroom workshops were again very positive, in line with last year's very high ratings. Teachers appear very appreciative of the classroom workshop component of this program.

School feedback on technical assistance was overwhelmingly positive and clearly demonstrated the importance and satisfaction with this program component. Where pre- and post-assistance recycling rates have been assessed, the average 69 percent increase in recycling shows significant improvement and directly aligns with the program goals of increasing the rate of waste diversion.

Overall, combining this year's evaluation results with those from the two previous years provides strong support for this program's ability to deliver a consistent and effective message regarding waste reduction and recycling. In addition to survey analysis results, the program continues to be highly regarded and consistently requested by schools, confirming that it serves an important role within the school community.

Recommendations

In 2015, Triangle recommends continuing with the core current program and further expanding upon it where applicable. Triangle reached 33 new schools in 2014, in addition to working with previously participating schools. Continued efforts will be made to reach the remaining 49 schools that have not participated in the program. Triangle will review all program elements and make updates as needed, as well as make minor modifications to incorporate teacher feedback. Recommendations specific to each program component include the following:

Assembly Recommendations:

- Increase the number of assemblies offered to meet the high demand from schools.
- Review scripts for clarifications as needed to address questions revealed in student pre- and post-test results (such as confusion about plastic bottle recycling).

Classroom Workshop Recommendations:

- Create FAQ document for families to address family take home questionnaire.
- Research languages spoken in Snohomish County and work with Waste Management to provide student take-home materials in key languages.
- Update all workshop scripts to reflect a complete list of all Next Generation Science Standards adopted by Washington State in fall 2014.
- Review workshop scripts and take home materials to further encourage action oriented behavior change.

Technical Assistance and Action Project Recommendations:

- Increase the number of technical assistance schools to address the need for working with new schools while continuing to work with schools that need ongoing assistance.
- Create a recognition component to honor custodians that go above and beyond their job descriptions to support successful school recycling programs.
- Continue to reach out to and meet with district Resource Conservation Managers to learn where district schools can use assistance and build a collaborative partnership between haulers and the district.
- Review current signs and make adjustments as needed to incorporate school requests (such as “Recycling Only” labels for top of lids with holes).
- Expand action project assistance to offer support with secondary schools, as requested.
- Implement Green Team surveys twice per year (June and December) to capture more feedback.