Community Pollution Prevention Grant Report
Final Project Report

A. Organization Information

Project Name:	Washtenaw County School Recycling and Education Program
Grantee Name:	Washtenaw Intermediate School District
Reporting Period:	August 2, 2015-January 31, 2017
Project Code:	430293-15

B. Project Goals and Objectives

The goal of the Washtenaw County School Recycling and Education Program was to establish recycling systems in eight public schools - each in a school district located outside of Ann Arbor. These districts encompass the communities of Dexter, Milan, Saline, Whitmore Lake, and Ypsilanti (two separate districts lie in Ypsilanti city limits). Two different recycling systems will be integrated into six elementary and two middle school buildings.

In addition to the implementation of a system for recycling, the program will included educational and training component. Building administration, instructional and custodial staff were to receive training on the processes involved with implementing a system. Adding recycling into building systems potentially created an opportunity for buildings/districts to save money and it was imperative that they understood and supported a culture of recycling. One of the tools that was to be created to support this effort was a video to be used as an internal-facing training tool, as well as an external-facing community education tool. This video, which was to feature the Materials Recovery Facility (MRF), was intended to create a sustainable training/educational tool that to be used in program expansion. This component, as well as program branding/marketing and collection boxes and carts, was supported by the Washtenaw County Solid Waste Division.

Finally, the program design included an in-classroom educational component to be implemented as a support for current third grade ecology lessons. This component, as well as ongoing custodial training, and informational sessions at family night events were to be conducted by the Ecology Center.

C. Meeting Goals and Objectives

The originally proposed goals and objectives consisted of the following;

Goal 1: Integrate recycling into one school building in each of the nine public school districts in Washtenaw County, excepting Ann Arbor, for total of eight participating schools.

- Objective 1: Integrate program into six elementary and two middle school buildings.
- Objective 2: In three elementary and one middle school building, pilot single stream recycling

model.

Objective 3: In three elementary and one middle school building, pilot source separated paper recycling model.

Goal 2: Decrease school contribution to landfill by 30% diverting to recycle centers.

Objective 1: Integrate recycling model into daily building routines.

Objective 2: Provide training to administrative, custodial, and instructional staff.

Goal 3: Assess and improve upon school building attitudes towards recycling.

Objective 1: Develop countywide baseline for attitudes/perceptions about recycling.

Objective 2: Integrate educational compliment to existing science curriculum through integration of recycling centered ecology classes.

The Washtenaw Intermediate School District (WISD) and core program partners achieved the initial goals outlined in the original proposal. Eight total schools participated in the program and consisted of six elementary buildings and two middle school buildings. Per the grant, the chosen facilities did not include any buildings from Ann Arbor Public Schools, Chelsea School District, and Manchester Community Schools. The schools identified for participation in the single-stream model piloted by Recycle Ann Arbor were Ypsilanti Middle School (Ypsilanti Community Schools), Lincoln Middle School (Lincoln Consolidated School District, Ypsilanti), Paddock Elementary (Milan Area Schools, Milan), and High Point (WISD, Ann Arbor). Participating in the Waste Management model were Mill Creek Middle School (Dexter Community Schools, Dexter), Heritage Elementary (Saline Area Schools, Saline), and Whitmore Lake Elementary (Whitmore Lake Public Schools, Whitmore Lake), and WIMA (Washtenaw International Middle Academy, Ypsilanti).

Each of the participating program locations worked with program partner Recycle Ann Arbor to develop a plan for instituting a recycling program building-wide. Core staff were identified during this initial planning process and training occurred, in partnership with the Ecology Center, at that time. Facility directors for each of the participating districts/buildings also received training and ongoing support utilizing the format of a regularly scheduled facility director meeting. As a result, the schools not only met, but exceeded the goal of 30% diversion to recycle centers, successfully diverting 48.5% of all materials.

The Ecology Center, also a strong program partner, conducted a pre- and post-test assessing student knowledge and attitude of recycling. The table below demonstrates a change in both aspects from the start of an integrated classroom instructional program as they compare to the end of the classroom instruction component.

RECYCLING KNOWLEDGE											
Calculated as number of items correctly labeled as either recyclable or not. Max score is 24.											Average %change
	Heritage	Honey Creek	Paddock	Whitmore Lake	**Elementary**	Lincoln	Mill Creek	WIMA	Ypsilanti	**Middle**	**All Schools**
Pre-Score	14.9	15.8	15.5	15.2		15.3	15.2	15.4	15.0		
Post-Score	20.2	N/A	21.5	21.5		15.9	17.8	18.4	N/A		
% Change in knowledge	22.1		25.0	26.3	**24.5**	3.7	6.7	12.5		**7.6**	**16.1**
Most common item misidentified as recyclable		old clothes, plastic spoon	used paper plate, plastic spoon	Used paper plate, broken plastic toy		plastic grocery bag	plastic spoon	plastic grocery bag			
Most common item misidentified as non-recyclable	empty malk carton	empty juice box	soup can	paper bag		soup can	yogurt container	soup can	pizza box		

RECYCLING ATTITUDE											
Calculated as number of positive statements about recycling that student agreed with. Max score is 18.											Average %change
	Heritage	Honey Creek	Paddock	Whitmore Lake	**Elementary**	Lincoln	Mill Creek	WIMA	Ypsilanti	**Middle**	**All Schools**
Pre-Score	13.3	12.7	13.6	11.8		12.3	12.4	11.7	5.8		
Post-Score	13.3	12.6	14.3	12.8		12.7	12.2	13.3	N/A		
% Change in attitude	0	0.5	4.4	5.5	**2.6**	1.7	1.1	5		**2.6**	**2.6**

Interestingly, the students all appear to have stayed the same with regards to their attitude towards recycling, with nearly 100% of all surveyed students reporting that they felt recycling was important. The real difference in data is the reported positive change in knowledge. This demonstrates the impact the classroom instruction had on students and significance of providing a core knowledge base in this type of program. The Ecology Center's full report can be found attached to this report.

Despite the fact that the program met its original goals, there were some challenges that arose along the way, mostly related to the implementation timeline. When the initial contract was executed by MDEQ, schools were not in session and most staff had not yet begun to report in. This presented a challenge in ensuring deliverables such as bin placement within buildings and staff trainings were met. The months of September and October present their own challenges as schools are quite busy during those times. Once the busy-ness of the new school year subsided, meetings and trainings proceeded, but this definitely put a crimp in the timeline. Holidays, snow days, and the different variances in building calendars as presented some challenges. There were several occasions in which staff attempted to pick up and weigh recycling and trash only to find the building inaccessible.

While the education and training aspects were a much needed addition, there were still many occasions on which materials were placed in the incorrect receptacle. This occurred most often when the staff at one building would turnover or when a sub was doing the work for the day. These are all additional pieces that will be addressed in future trainings and in the development of MOUs with providers and schools.

D. Environmental benefits of the project, new partners made, and waste and pollutants reduced

The environmental impact of the program was profound. As indicated previously, the actual diversion rate for the program was well above the target goal of 30%, landing at a final rate of

48.5%. The final cumulative totals (in pounds) by month and quarter are indicated below. In addition, a spreadsheet demonstrating the impact of single stream vs. dual stream is also attached.

	Recycle	Trash
September	828.00	1,125.00
Total Q1:	828.00	1,125.00
October	640.00	1,440.00
November		
December	139.00	369.00
Total Q2:	779.00	1,809.00
January	3,301.65	2,118.85
February	2,336.83	2,494.20
March	2,899.59	2,793.05
Total Q3:	7,511.07	6,596.10
April	4,885.87	6,102.40
May	6,357.20	7,088.40
June	6,953.50	3,312.00
Total Q4:	18,196.57	16,502.80
September	2,633.90	4,050.00
Total Q5:	2,633.90	4,050.00
October	4,650.60	6,048.00
November	3,071.10	3,771.00
December	8,365.80	9,075.00
Total Q6:	16,087.50	18,894.00
Program Total YTD:	**46,036.04**	**48,976.90**

While the diversion rate is extremely important to showing the actual environmental impact, another important bi-product was also created- a shift in school culture towards recycling. With the added value of training, education, and continued supports to the buildings, each facility has shifted toward a culture of diversion- recycling has become less an intentional process and more of a norm within the building.

While new partners did not necessarily come to the table after the launch of the program, the partnership between the WISD, Recycle Ann Arbor, Washtenaw County Solid Waste Division, Waste Management, and Ecology Center was a new one. This partnership has further been solidified in order to sustain the program moving forward with new agreements for service and financial support fully established between the parties (see attached for WISD/Washtenaw County agreement).

One positive result was the addition of new program sites, which launched in September 2016. These buildings, Symons Elementary (Milan Area School District) and Brick Elementary (Lincoln

Consolidated Schools) were added based on the response of the other buildings already participating in the program.

E. Products generated

Over the duration of this grant, several products were made to help satisfy our goals and objectives. These products include an education and training video, project branding, pre/post survey protocols, single and dual stream signage, and other signs and banners. We also received reports from the Ecology Center. These reports include findings from student and teacher surveys, along with anecdotal reporting on outcomes from Family Nights and conversations with administrators.

The link to the video that was created can be found via the following url (copy and paste into browser): https://a2ctn.viebit.com/player.php?hash=5df4f85a51859b62e7fbe23c00b7e032. Samples of the branding, survey protocols, signage and reports are all attached to the report.

F. Sustainability

Sustainability beyond the life of the grant has always been a concern and a point of discussion for the duration of the grant period. However, the initial partners were committed to the continuation of the work and agreed to work together beyond the life of the grant. Recognizing the importance of diverting waste generated by schools, Washtenaw County was motivated to keep the program in place and agreed to support the addition of new sites through the purchase of necessary bins, as well as through payment for the services of Recycle Ann Arbor, Waste Management, and Ecology Center. The initial agreement outlines continued support for the initial eight sites and creates options for adding new sites. Memoranda of Understanding are being drafted and will be expected of current and new sites moving forward. These MOUs outline clear responsibilities for access to buildings and people (for training purposes), as well as for the care and replacement of equipment and supplies. Each year, the county will assess capacity for support and will use this information to make recommendations for new program sites. WISD will continue to support this work by providing connectivity between the partners and schools, and Recycle Ann Arbor and Ecology Center will continue to provide education, training, and waste assessment skills on a contractual basis with the county.

	April			May			June			September			October			November			December		
	Recycling	Waste	% Recycling	Recycling	Waste	% Recycling	Recycling	Waste	% Recycling	Recycling	Waste	% Recycling	Recycling	Waste	% Recycling	Recycling	Waste	% Recycling	Recycling	Waste	% Recycling
Recycle Ann Arbor Sites (Single Stream)																					
High Point	901.60	1,351.80	40%	1,273.40	1,978.20	39%	1,382.00	972.00	59%	584.40	540.00	52%	643.40	1,692.00	28%	583.60	360.00	62%	1,117.60	1,440.00	44%
Ypsilanti	459.27	2,754.00	14%	1,170.00	1,674.00	41%	159.10	702.00	18%	64.80	540.00	11%	47.80	405.00	11%	78.30	-	100%	294.20	147.00	67%
Paddock	1,110.40	533.00	68%	1,479.00	567.00	72%	1,370.80	648.00	68%	1,355.10	270.00	83%	873.10	1,350.00	39%	645.40	405.00	61%	1,255.40	2,088.00	38%
Mill Creek	60.00	270.00	18%	12.00	405.00	3%	27.00	-	100%	-	-	-	514.30	-	100%	48.20	405.00	11%	1,475.60	1,080.00	58%
Symons Elementary																321.80	270.00	54%	981.70	1,620.00	38%
Brick Elementary													264.60	-	0%	300.00	675.00	31%	450.70	2,160.00	17%
Total Single Stream:	2,531.27	4,908.80	34%	3,934.40	4,624.20	46%	2,938.90	2,322.00	56%	2,004.30	1,350.00	60%	2,343.20	3,447.00	40%	1,977.30	2,115.00	48%	4,142.80	4,755.00	47%
Waste Management Sites (Dual Stream)																					
Heritage	570.00	237.60	71%	450.00	324.00	58%	660.00	27.00	96%	-	-	-	-	-	-	120.00	-	100%	1,297.30	900.00	59%
Lincoln	1,466.60	594.10	71%	1,612.80	1,692.00	49%	2,754.60	666.00	81%	629.60	2,700.00	19%	622.10	1,692.00	27%	244.20	576.00	30%	1,403.00	1,080.00	57%
Whitmore Lake	198.00	91.80	68%	150.00	178.20	46%	360.00	81.00	82%	-	-	-	497.60	-	100%	322.40	810.00	28%	604.90	1,620.00	27%
WIHI/WIMA	120.00	270.00	31%	210.00	270.00	44%	240.00	216.00	53%	-	-	-	1,187.70	909.00	57%	407.20	270.00	60%	917.80	720.00	56%
Total Dual Stream:	2,354.60	1,193.50	66%	2,422.80	2,464.20	50%	4,014.60	990.00	80%	629.60	2,700.00	19%	2,307.40	2,601.00	47%	1,093.80	1,656.00	40%	4,223.00	4,320.00	49%

Education Outcomes
Washtenaw School Recycling Pilot
2015-2016

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July 15, 2016
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Executive Summary

During the 2015-2016 school year, the Ecology Center partnered with the Washtenaw Intermediate School District, Recycle Ann Arbor, Waste Management, and Washtenaw County Waste Services to pilot a new recycling initiative within eight elementary and middle schools around Washtenaw County. The project was funded by a Pollution Prevention grant from the Michigan Department of Environmental Quality. The Ecology Center planned and delivered 8 staff trainings, 20 in-class workshops, 7 after-school club sessions, and 2 after-school family education events, reaching an estimated 560 students, teachers, and family members directly. Additional responsibilities included preparation of a video to be used in staff trainings, development of assessment tools, and analysis of data. Written and verbal feedback from teachers and students are summarized within this report and serve as the basis for the conclusions and recommendations that we propose as next steps.

Key outcomes of the pilot program suggest that future recycling education efforts should include and consider the following:

- Larger gains in recycling knowledge were observed among elementary students
- Training that invited all school staff set stage for better recycling outcomes
- Good alignment existed between recycling lessons and elementary curriculum priorities
- Starting education program early in school year sets stage for better recycling outcomes
- Teachers and students would benefit from additional support after initial programs

Contents

Educational Plan

The Ecology Center Education Team planned and facilitated both staff and student recycling education opportunities in eight schools around Washtenaw County during the 2015-2016 school year. Each participating school was offered one staff recycling training, in-class recycling workshops for all 2-3rd or 6-7th grade students, and a packet of resources prepared for educators with further information and activity suggestions shared electronically. All elementary schools were also offered the opportunity to host an after-school family event to showcase the school's progress with recycling, showcase samples of student work, and further educate students and their families about recycling through a variety of interactive learning stations.

Timing of educational programs were intended to coincide with the introduction of new recycling service in the schools. Delivery of staff trainings, classroom programs, and after-school events were scheduled by Ecology Center Education Director on a case by case basis through communication with school administrators or teachers that administration identified as points of contact, in coordination with those project partners responsible for indoor set-up of recycling service.

All students who participated in Ecology Center recycling programs were asked to complete written pre and post surveys to record change in student attitudes and knowledge about recycling during the pilot. Pre-surveys were administered by classroom teachers prior to Ecology Center education in-class program. Post-surveys were administered in May or June 2016. At the end of the school year, staff were also asked to provide written feedback on the quality and effectiveness of recycling education provided by the Ecology Center.

Staff training included (1) an introduction to the source, scope, and purpose of the school's new grant-funded recycling service, (2) basic features of indoor collection system and signage, (3) review of a recycling do/don't checklist, and (4) an opportunity to respond to questions. Ecology Center staff worked with professional videographer to plan and record a training video, to be integrated into trainings for custodial and teaching staff.

Student in-class programs were to be scheduled immediately after completion of the staff training. The 1-hour in-class program included (1) puzzle activity to trace the key steps in a product life cycle and analyze how cycles change with the introduction of recycling, (2) hands-on recycle activity to practice sorting using real, clean waste items, and (3) an action planning template to think through possible roles or projects that students could initiate.

Education Action

The following table identifies the type and timing of recycling education led by Ecology Center educators during the 2015-2016 school year pilot.

School	Staff Training 20-40 min	55 min In-Class Student Workshop	After-School Programs
Heritage Elementary	12/14/15 30 minutes at full staff meeting	12/14/15 Two students from each classroom, all grades, ~50 students	
Whitmore Lake Elementary	10/27/15 40 minutes at full staff meeting	11/13/15 Two 3rd grade classes, ~50 students	5/31/16 Recycling Renewed Family Night, 2.5 hrs
Paddock Elementary	10/21/15 20 min at full staff meeting	12/10/15 Five 2nd grade classes, ~100 students	5/25/16 Recycling Renewed Family Night, 2.5 hrs
Honey Creek Elementary / High Scopes	12/02/15 30 minutes at full staff meeting	12/02/15 Two classes, mixed ages, ~40 students	
Washtenaw International Middle (WIMA)	11/19/15 30 minutes at full staff meeting	11/19/15 2 science classes & 1 elective class, ~70 students	
Mill Creek Middle	1/15/16 30 minutes with 4 school selected lead-teachers	2/5/16 Leadership class, ~60 students	
Ypsilanti Community Middle	10/28/15 30 minutes with 6 school selected lead-teachers (no administrators present)	1/27/16, 2/29/16 6th gr science classes, ~75 students	April-May 2016 After-school club w/ recycling project, met once per week for 7 weeks ~8 students
Lincoln Middle	1/11/16 40 min with 1 admin and 2 school selected lead-teachers	1/11/16 ~40 green team students	
TOTAL	8 trainings	20 in-class programs	7 meetings & 2 events

Staff Trainings

All schools received some staff training. The timing of staff training ranged from 20-40 minutes depending on the amount of time that school administrators were willing to designate. All the elementary trainings and the training at Washtenaw International Middle Academy took place during regular staff meeting time, and the entire teaching staff and key administrators were present. At Lincoln, Ypsilanti Community, and Mill Creek Middle schools, administrators

arranged for only 2-6 teachers to be trained by Ecology Center staff. The principals at these schools explained they did not have time available during a meeting with full staff, and that the teacher-leaders were in a good position to share the information with their peers. Custodial staff did not attend the trainings despite being invited to do so. Within each school, custodial staff worked with Recycle Ann Arbor to plan service details and review recycling rules.

During staff trainings, teachers most commonly asked about whether specific items were recyclable, what roles they and their students were expected to have in the new system, and requested suggestions for helping their students recycle properly. One activity during the training asked staff to work with a partner to identify what they believed to be recyclable and non-recyclable items from a checklist. After teachers completed the checklist, the facilitator verbally provided the correct answers, which prompted questions from teachers and an opportunity for facilitator to explain the recycling rules. When asked at the end of the training, teachers said that the checklist was the most "eye-opening" part of the training and left them with the feeling that "we all have something to learn about recycling." "I have been recycling for 20 years, but technology changes."

Within 48 hours of staff training, Ecology Center educators electronically shared a packet of information describing further online resources and suggested activities for building a culture of recycling in the classroom. The information packet was emailed directly to all teachers except for those schools where the administrator specifically requested to distribute the packet to teachers from their offices, including Heritage Elementary in Saline and Lincoln Middle. At Ypsilanti Community Middle and Mill Creek Middle School in Dexter, only those teacher-leaders who attended the training received a packet.

Student In-Class Programs

All of the participating schools received some student-focused recycling education. School administrators or teacher-leaders coordinated with Ecology Center educators to schedule in-class education. Schools either elected to have programs with specific grade-level (all second, third, or six grade students) or identified another group of students to be trained to take responsibility for student leadership on recycling (green team, leadership class, representatives from each classroom). Student workshops lasted 55 minutes and involved a brief introduction followed by three small-group activities. (1) The student programs all introduced students to features of the new recycling system, including whether or not they were single or dual stream sorting, and (2) explored recycling rules through hands-on sorting practice with real items, pictures, and words. Students at all grade levels were also (3) introduced to the concept of a product life cycle using age appropriate examples and physical manipulatives to sequence steps in the process. Students compared the linear system

of a product that ends up in the trash with the circular model of a recycling system. Recycling benefits both in terms of pollution prevention and resource conservation were identified by students during this activity. (4) Program ended with introduction of Action Planning template and guiding students through the first steps of planning educational action they could take in small groups or as a class to support indoor collection system for recycling and/or further educate the school community about recycling. Learning goals were to raise student awareness about new recycling initiative within school building, train students to understand what materials can be recycled, motivate students to value recycling, and empower students to be actively involved in making school recycling a success.

At Paddock, Whitmore Lake, Ypsilanti, Honey Creek, and Washtenaw International, student programs were done in classrooms with 20-30 students in each class. At Heritage and Lincoln teachers selected 1-2 students from each classroom in the school to attend one workshop, which was held in the cafeteria or library. Mill Creek arranged for all 60 of the students in their leadership course to participate in a workshop, and then identified a subset of the students from that class to take a leadership role in managing recycling initiative.

After-School Programs

Two elementary schools, Paddock in Milan and Whitmore Lake Elementary, elected to host Recycle Renewed Family Fun Nights late in May. These schools expressed enthusiasm about having the event, but once scheduled, Ecology Center staff were required to put in considerable effort to coordinate the event with little support from the schools. Rather than regarding the event as an opportunity to showcase school achievements in recycling and educate families about student work, teachers and administrators expressed that they did not want to take on "extra work" to prepare for the event. Ecology Center educators provided 10-12 activity stations, a zero-waste meal, and a brief slideshow highlighting the school's recycling success. Feedback from families and teachers who attended identify the events as both informative and enjoyable. The principals at both schools indicated that they were surprised by the quality of the event. In response to lower than expected attendance, they cited the following reasons: little effort to promote events by schools, conflicting after-school family commitments, and a lack of student work to draw parents. Both administrators requested the opportunity to have another Recycling Family Night during the 2016-2017 school year, now that they had "seen it in action" and "could do a better job of having school prepare" for it.

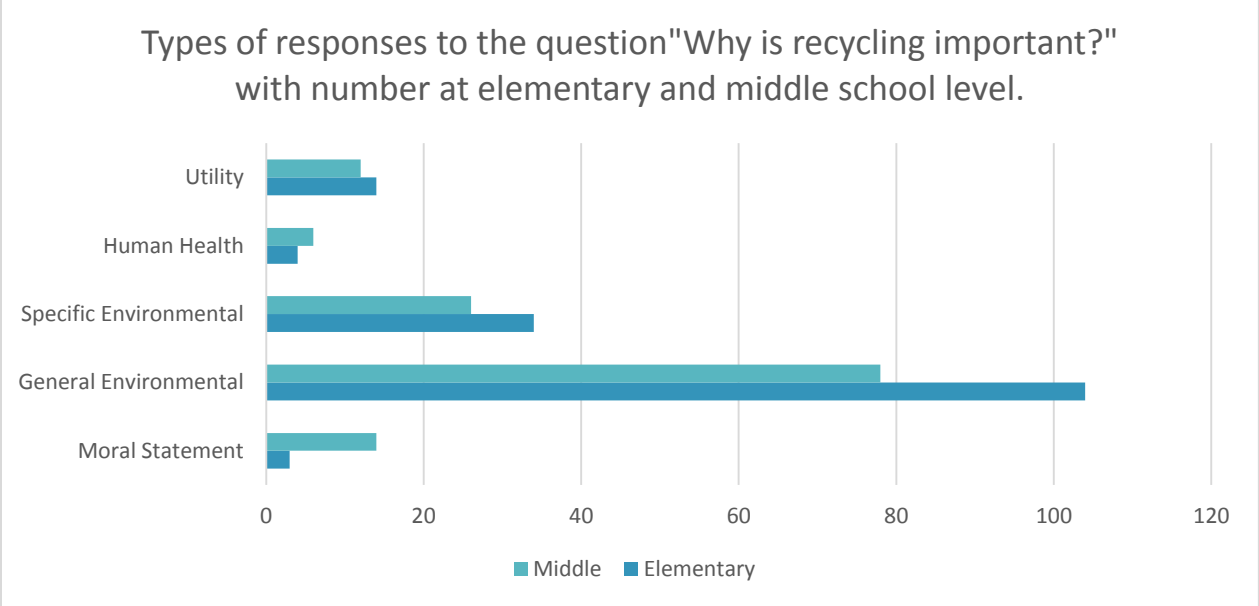
Persistently poor recycling results at Ypsilanti Community Middle School prompted follow-up interviews with teachers and initiation of an after-school environmental club during April-May, 2016. The Environmental Club was offered as one option for students enrolled in the Bright Futures program. Eight students met with Ecology Center educators once per week for 7 weeks for 1.5 hrs. Students expressed authentic interest in the Flint Water Crisis, its causes and consequences, and a desire to take action to provide bottled water for Flint citizens. This topic provided an opportunity to engage students to think about plastic bottle recycling in Flint and more broadly and raise awareness about the recycling initiative within their school. Students were trained to do recycling audits on indoor collection boxes and began to sort and weigh their school's recycling on a weekly basis, learning about contamination and the rules of recycling in the process. Ultimately, students identified recycling as a source for raising funds to purchase bottled water for Flint. Students created flyers to encourage their peers to use the recycling bins appropriately. Over a two-week period, students raised over $50 through the collection of returnable cans and bottles and by arranging for a private donor to give the club 5 cents for each metal or plastic container and 10 cents for each pound of paper collected in the school's common area recycling receptacles (students did not examine boxes in individual classrooms). Students discovered that the library boxes were used almost entirely for paper, while hallway receptacles were more likely to contain plastic and metal containers.

Student Learning, Survey Results

Nearly 100%of all students responded yes to the question: "Is recycling important?" Open-ended responses describing "why recycling is important" fell into one of five categories.

1. Moral statement about taking "right" action (e.g. we should recycle, we are better people if we recycle, it is good to reduce reuse recycle)
2. General statement about environmental health (e.g. helps the Earth, saves the planet, keeps planet/neighborhood clean)
3. Specific statement about environmental health (e.g. recycling reduces air pollution, reduces the amount of material going to landfills, conserves our natural resource
4. Statement that makes a human health connection (e.g. want fewer landfills because landfills can contaminate water and make people sick, we need trees to breathe and recycling saves trees)
5. Utility statement (e.g. many things can be reused, can make something new)

Student responses were placed into one of these five categories and counted. Results are presented in Figure 2.



No obvious patterns between attitudes and recycling knowledge were discerned. Whether students recycled at home or identified recycling knowledge as useful on the pre-survey, these features were not statistically linked to ability to identify what goes in the recycle bin (either on pre-survey or post-form). Overall, students at all participating schools began the program with generally positive attitudes toward recycling, which may account for why there was little or no change in attitudes toward recycling. It is also possible that the assessment tool was not properly designed to be sensitive enough to pick-up attitude changes. There were however, significant changes in knowledge about recycling among students, close to a 30% increase in knowledge.

Figure 3. Data comparing pre/post survey data on student learning.

RECYCLING KNOWLEDGE											
Calculated as number of items correctly labeled as either recyclable or not. Max score is 24.											**Average %change**
	Heritage	Honey Creek	Paddock	Whitmore Lake	**Elementary**	Lincoln	Mill Creek	WIMA	Ypsilanti	**Middle**	**All Schools**
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% Change in knowledge	22.1		25.0	26.3	**24.5**	3.7	6.7	12.5		**7.6**	**16.1**
Most common item misidentified as recyclable		old clothes, plastic spoon	used paper plate, plastic spoon	Used paper plate, broken plastic toy		plastic grocery bag	plastic spoon	plastic grocery bag			
Most common item misidentified as non-recyclable	empty malk carton	empty juice box	soup can	paper bag		soup can	yogurt container	soup can	pizza box		
RECYCLING ATTITUDE											
Calculated as number of positive statements about recycling that student agreed with. Max score is 18.											**Average %change**
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Post-Score	13.3	12.6	14.3	12.8		12.7	12.2	13.3	N/A		
% Change in attitude	0	0.5	4.4	5.5	**2.6**	1.7	1.1	5		**2.6**	**2.6**

Teacher Feedback

The Ecology Center requested feedback from teachers at all participating schools on the quality and quantity of education provided during the program pilot. Teachers from three schools

responded by completing an anonymous written survey (Heritage Elementary N=7, Whitmore Lake N=10, Lincoln Middle N=5), while teachers at Ypsilanti Community Middle (N=4) provided feedback to Ecology Center educators via phone interview. Responses were recorded using a Likert-scale of 1-5, with 1 being low and 5 being high. Responses to a subset of survey questions are summarized in Figure 3.

Figure 3. Teacher post-program feedback from four schools.

Survey Item	School	Response Average±	All School Average
Recycling initiative overall successful?	Heritage Elementary*	4.0	3.4
	Whitmore Lake Elementary*	3.9	
	Lincoln Middle School**	4.2	
	Ypsilanti Middle School**	1.5	
Overall quality of education?	Heritage Elementary	4.4	4.1
	Whitmore Lake Elementary	4.1	
	Lincoln Middle School	4.0	
	Ypsilanti Middle School	4.0	
Quantity of education?	Heritage Elementary	2.8	2.8
	Whitmore Lake Elementary	3.0	
	Lincoln Middle School	3.0	
	Ypsilanti Middle School	2.2	
Teachers understood enough about recycling to help students?	Heritage Elementary	3.7	3.5
	Whitmore Lake Elementary	3.4	
	Lincoln Middle School	4.2	
	Ypsilanti Middle School	2.6	
Teachers had access to good recycling education resources?	Heritage Elementary	4.4	3.4
	Whitmore Lake Elementary	4.6	
	Lincoln Middle School	2.6	
	Ypsilanti Middle School	2.0	

*All staff training, **Teacher-leaders trained, ± Scale 1-5, 1= strongly disagree, 5= strongly agree

Teachers at elementary and middle levels both rated the overall *quality* of education programs as good (average 4.1). However, teachers at the elementary level generally identified the student program activities as *well-aligned* to their teaching priorities (average 4.6), while middle grade teachers did not (average 3.0). Teachers at all the surveyed schools identified a need for more recycling education, and a desire to see more education in the coming year was the most frequent written comment. Elementary schools varied more in their assessment of the amount of time devoted to recycling education, with very few teachers indicating that it had become daily practice for their students. The variation in teacher perceptions about the amount of time devoted to recycling education does not coincide with the timing or type of student education that school received from the Ecology Center. A more reasonable explanation may be that individual teachers voluntarily devoted significantly more or less time to recycling education in their individual classrooms. This interpretation is supported by the fact that 92% of elementary teachers who responded to the survey agreed or agreed strongly with the statement that "recycling success depended on volunteered effort from a few individuals". These same teachers disagreed or disagreed strongly with the statements that "we had strong leadership within the school to coordinate recycling" and "our whole school was motivated to recycle." Taken together these results indicate that teachers felt somewhat isolated in their efforts.

Teachers at those schools who started service mid-year commented that introduction at beginning of year would be more effective in establishing school culture for recycling: "start the discussion at the beginning of the year with kids (more education)." "An assembly at the start of

the year to launch the program with students next year would be ideal." Teachers at schools who started service in October and November 2015 suggested that a second round of educational programs later in the year would be beneficial, after teachers and students "had some practice with recycling and figured out how many questions we had."

Results from the 2015-2016 recycling pilot in 8 Washtenaw County schools indicate that the staff trainings were most effective when administrators delegated time for full staff to participate. It is also possible to interpret the differences in effectiveness of student education as linked to the level of training that teachers received. In those schools where only a few lead teachers were selected to participate in training, we see less growth in student knowledge about recycling process and rules. We do not have clear data on whether the lead teachers followed through in sharing their training or the electronic resources with peers. It is possible that at some schools the majority of teachers were not well-informed about the new recycling service or opportunity for their students to participate in education.

Recommendations for Future

We recommend that recycling education for staff and students remains an integral part of future initiatives to continue or expend recycling in Washtenaw County schools. We propose that new recycling education includes the following:

- Training for staff that
  - involves all staff and is supported by administration
  - alerts them to a changes within the school
  - clearly identifies goals and expectations of the initiative
  - allows teachers to recognize a need for better recycling knowledge
  - clearly links recycling to their classroom educational priorities
  - provides opportunity for questions to be asked and answered
  - offers concrete suggestions to help teachers learn more or plan recycling education for their students

- Student education that
  - helps students identify value in recycling
  - provides clear information about recycling rules
  - helps students understand the reason for the rules, including some understanding of where recycling goes and how it is processed
  - gives students guided practice with sorting recyclables
  - provides opportunity for questions to be asked and answered
  - provides opportunity for students to share recycling knowledge/achievements

- Printed resources that
  - describe recycling rules with attractive and unambiguous visuals
  - are large enough to be read at a distance
  - answer common questions about recycling

  - provide source where further help or information can be found
  - can be taken home to share with families

- Opportunities for teachers and students to receive ongoing or follow-up educational support during the school year.

We recommend planning for more than one educational point of contact with students during the school year, particularly for those schools who do not have a history of recycling or struggled to initiate recycling during the 2015-2016 pilot. Teacher evaluations highlighted the need to provide more than one opportunity for questions to be asked and answered, and these teachers expressed that they did not feel qualified with the necessary knowledge and experience to guide their students on this topic. If repeat visits from recycling education experts are not feasible, establishing an online recycling discussion board may be a reasonable alternative. The discussion board could be a hub for downloadable recycling resources, online links, classroom activity ideas/sharing among teachers, as well as an avenue for ongoing communication with recycling experts to help schools and students address questions and challenges as they arise throughout the school year. We would not recommend entirely replacing face to face education workshops, but the online site could potentially provide the needed follow-up and ongoing support that teachers request. Ecology Center educators would be willing to explore the logistics for establishing and maintaining such a site for Washtenaw County schools.

Recycling education most closely links to Michigan science curriculum standards at the elementary grades and social studies standards at the middle grades. Middle grade teachers at Ypsilanti also provided feedback that they and their students lacked motivation to recycle and recommended education linking recycling to economic benefits as a means for generating greater interest and value on the subject. Future middle grade programs can provide additional layer of analysis about the benefits of recycling by comparing the economics and energy use of products made from raw versus recycled materials. Using maps students can visualize the distance that raw versus remanufactured materials travel to make a yogurt cup, aluminum can, or notebook sold in Michigan stores and examine how this relates to local jobs and opportunities. This modification to the program would allow students to make personal financial connections to the process and make the recycling education more closely tied to curriculum standards for this grade level, addressing concerns expressed by middle grade teachers reluctant to take class time “away from curriculum priorities” to do lessons on recycling.

Washtenaw Student Recycling Survey -POST

School Name: _____

My Grade: ☐ 3rd ☐ 6th

1. I recycle at home.	☐ No	☐ Yes
2. I recycle in my classroom.	☐ No	☐ Yes
3. I recycle in my lunchroom.	☐ No	☐ Yes
4. I have done activities to learn about recycling with my class.	☐ No	☐ Yes
5. I went to a Recycling Renewed Family Night.	☐ No	☐ Yes
6. I help teach other students about recycling.	☐ No	☐ Yes

7. It is useful for me to know about recycling.	☐ No	☐ Sometimes	☐ Yes
8. Recycling is hard to do.	☐ No	☐ Sometimes	☐ Yes
9. I am confused about what I can recycle.	☐ No	☐ Sometimes	☐ Yes
10. I would go out of my way to find a recycle bin.	☐ No	☐ Sometimes	☐ Yes
11. I wish more people cared about recycling.	☐ No	☐ Sometimes	☐ Yes
12. My family cares a lot about recycling.	☐ No	☐ Not sure	☐ Yes

13. Do you think recycling is important? ☐ No ☐ Yes

Please explain why or why not.

_____

_____

14. In the space below, please draw two pictures.

What you think happens to a plastic bottle that is put in a trash can?	**What do you think happens to a plastic bottle that is put in a recycle bin?**

15. Write the letter **R** by those items that belong in your school recycle bin.

_____Piece of paper	_____Paper bag	_____Empty milk carton
_____Empty juice box	_____Soup can	_____Cardboard box
_____Candy wrapper	_____Banana peel	_____Plastic spoon
_____Bottle cap	_____Broken plastic toy	_____Used paper plate
_____Plastic bottle	_____String or yarn	_____Paper towel
_____Styrofoam cup	_____Old clothes	_____Plastic grocery bag
_____Pop can	_____Yogurt container	_____Plastic sandwich bag
_____Potato chip bag	_____Pizza Box	_____Battery

Washtenaw Student Recycling Survey -PRE

School Name: _____

My Grade: ☐ 3rd ☐ 6th

1. I recycle at home.	☐ No	☐ Yes
2. I recycle in my classroom.	☐ No	☐ Yes
3. I recycle in my lunchroom.	☐ No	☐ Yes
4. I have done activities to learn about recycling with my class.	☐ No	☐ Yes
5. I help teach other students about recycling.	☐ No	☐ Yes

6. It is useful for me to know about recycling.	☐ No	☐ Sometimes	☐ Yes
7. Recycling is hard to do.	☐ No	☐ Sometimes	☐ Yes
8. I am confused about what I can recycle.	☐ No	☐ Sometimes	☐ Yes
9. I would go out of my way to find a recycle bin.	☐ No	☐ Sometimes	☐ Yes
10. I wish more people cared about recycling.	☐ No	☐ Sometimes	☐ Yes
11. My family cares a lot about recycling.	☐ No	☐ Not sure	☐ Yes

12. Do you think recycling is important? ☐ No ☐ Yes

Please explain why or why not.

_____

_____

_____

13. In the space below, please draw two pictures.

What you think happens to a plastic bottle that is put in a trash can?	What do you think happens to a plastic bottle that is put in a recycle bin?

14. Write the letter **R** by those items that you think belong in a recycle bin.

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_____Plastic bottle	_____String or yarn	_____Paper towel
_____Styrofoam cup	_____Old clothes	_____Plastic grocery bag
_____Pop can	_____Yogurt container	_____Plastic sandwich bag
_____Potato chip bag	_____Pizza Box	_____Battery

Washtenaw Student Recycling Survey -PRE

School Name: _____

My Grade: ☐ 3rd ☐ 6th

1. I recycle at home.	☐ No	☐ Yes
2. I recycle in my classroom.	☐ No	☐ Yes
3. I recycle in my lunchroom.	☐ No	☐ Yes
4. I have done activities to learn about recycling with my class.	☐ No	☐ Yes
5. I help teach other students about recycling.	☐ No	☐ Yes

6. It is useful for me to know about recycling.	☐ No	☐ Sometimes	☐ Yes
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10. I wish more people cared about recycling.	☐ No	☐ Sometimes	☐ Yes
11. My family cares a lot about recycling.	☐ No	☐ Not sure	☐ Yes

12. Do you think recycling is important? ☐ No ☐ Yes

Please explain why or why not.

_____

_____

_____

13. In the space below, please draw two pictures.

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_____Styrofoam cup	_____Old clothes	_____Plastic grocery bag
_____Pop can	_____Yogurt container	_____Plastic sandwich bag
_____Potato chip bag	_____Pizza Box	_____Battery

Washtenaw Student Recycling Survey -POST

School Name: _____

My Grade: ☐ 3rd ☐ 6th

1. I recycle at home.	☐ No	☐ Yes
2. I recycle in my classroom.	☐ No	☐ Yes
3. I recycle in my lunchroom.	☐ No	☐ Yes
4. I have done activities to learn about recycling with my class.	☐ No	☐ Yes
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6. I help teach other students about recycling.	☐ No	☐ Yes

7. It is useful for me to know about recycling.	☐ No	☐ Sometimes	☐ Yes
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11. I wish more people cared about recycling.	☐ No	☐ Sometimes	☐ Yes
12. My family cares a lot about recycling.	☐ No	☐ Not sure	☐ Yes

13. Do you think recycling is important? ☐ No ☐ Yes

Please explain why or why not.

_____

_____

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_____Styrofoam cup	_____Old clothes	_____Plastic grocery bag
_____Pop can	_____Yogurt container	_____Plastic sandwich bag
_____Potato chip bag	_____Pizza Box	_____Battery

Concept 1-b

WISD Emblem Design

Washtenaw Zero Waste
Logo Design Presentation
Washtenaw County Office of Water Resources Commissioner
and Recycle Ann Arbor

August 19, 2015 Bidlack Creative Group

CONTAINERS ONLY

1 2 4 5 6 7

NO:

All containers must be empty and *clean*.

Remove all flat plastic lids.

DEQ MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

michigan.gov

recycle ann arbor

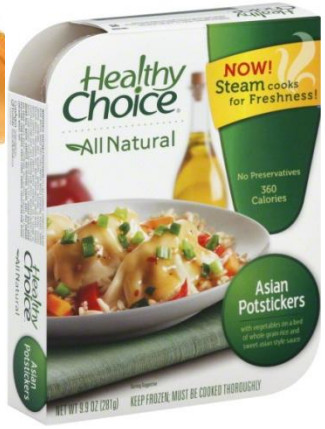
WASHTENAW COUNTY MICHIGAN 1826

ECOLOGYCENTER

Washtenaw ISD

WM WASTE MANAGEMENT

PAPER ONLY



NO:

Empty and flatten all boxes.

Place all paper in clear, sealed plastic bags.

DEQ MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

michigan.gov

recycle ann arbor

WASHTENAW COUNTY MICHIGAN 1826

ECOLOGYCENTER

Washtenaw ISD

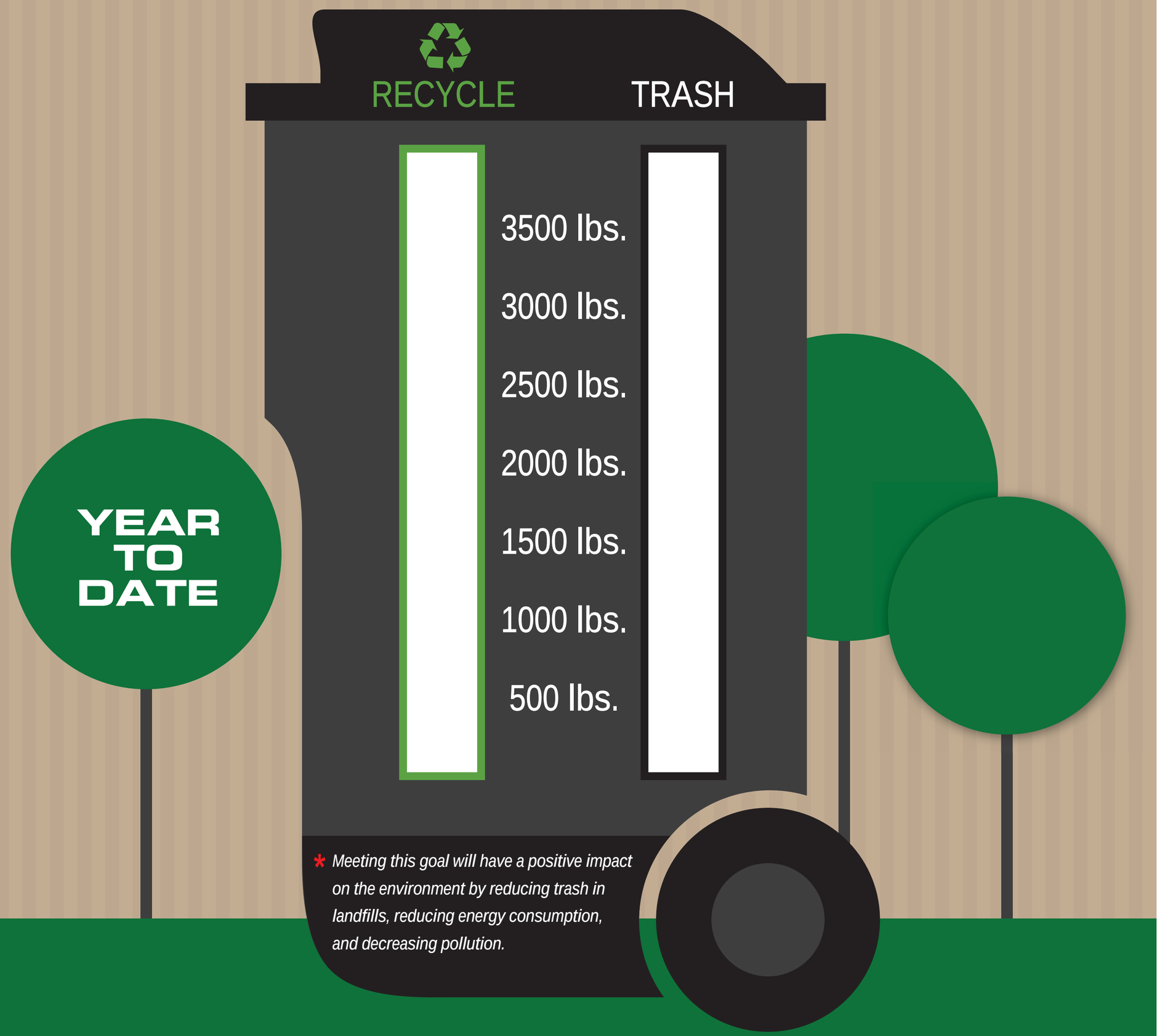
WM WASTE MANAGEMENT

finished size:
30" x 40"

"Can We Beat 50?"

The goal of the Washtenaw County School Recycling and Education Program *(funded in part by the Michigan Department of Environmental Quality Community Pollution Prevention Grant)* is to establish recycling systems in public schools. The program includes an education and training on the processes involved with implementing a system, as well as an in-classroom education. The program exists to create a systemic, integrated recycling program located in schools, decreasing school landfill contributions by 30% and diverting to recycling centers, and improving building attitudes and perceptions around recycling.

OUR GOAL? Send a minimum 50% school waste to recycling and a maximum 50% to landfills.*



* *Meeting this goal will have a positive impact on the environment by reducing trash in landfills, reducing energy consumption, and decreasing pollution.*

Washtenaw County School Recycling and Education Program

Washtenaw ISD
A REGIONAL EDUCATIONAL SERVICE AGENCY

DEQ

Washtenaw County Michigan 1826

Staff Survey - Washtenaw County School Recycling 2016-2017

Please take a moment to let us know what worked well this year and what could be improved. This survey is anonymous. Please return to the envelope provided, which will be collected on _____. Questions, please contact katy@ecocenter.org.

THANK YOU for participating in this important program!

1. School Name

- ☐ Brick Elementary
- ☐ Cornerstone Elementary
- ☐ Estabrook Learning Center
- ☐ Heritage Elementary
- ☐ High Point School/Honey Creek
- ☐ Lincoln Middle School
- ☐ Mill Creek Middle School
- ☐ Paddock Elementary
- ☐ Saline Middle School
- ☐ Symons Elementary
- ☐ Washtenaw International High School / Middle School
- ☐ Whitmore Lake Elementary
- ☐ Whitmore Lake Middle/High
- ☐ Ypsilanti Middle School

2. What is your role within the school?

- ☐ Administrative
- ☐ Teaching
- ☐ Custodial
- ☐ Support Staff
- ☐ Other:

3. **Would you describe the new recycling initiative at your school as successful overall?**

Not successful 1 2 3 4 5 Very successful

4. How would you rate the QUALITY of education your students received about recycling?

Poor 1 2 3 4 5 Exceptional

5. **How would you rate the AMOUNT of education your students received about recycling during the school year?**

None 1 2 3 4 5 Reinforced daily in classroom

6. **How would you rate the recycling system set-up and collection services your school received?** (Services were provided by Recycle Ann Arbor and Waste Management)

Disappointing 1 2 3 4 5 Excellent

7. **Indicate whether you agree or disagree with each of the following statements:**

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	I don't know
We had a good system for students, teachers, or custodians to collect recycling.						
Posters with recycling rules were clear and well placed.						
We had strong leadership to support / coordinate recycling.						
Recycling success depended on volunteered effort from a few individuals within school community.						
Our whole school was motivated to recycle.						
Teachers understood enough about what and how to recycle to help students.						
Students were interested and motivated to recycle.						
Teachers had easy access to good recycling education resources and activity ideas.						
Recycling experts were available to troubleshoot and were helpful.						

8. **What formats for staff and student education do you think would work best for your school in the future?**

9. **What kind of support do you think your school needs in the future to create or maintain a recycling culture?**

10. **From your experience, what recommendations would you give to other schools that are planning to recycle?**

Any other comments?

STUDENT _____

ECOLOGYCENTER
Healthy People, Healthy Planet

Student Recycling Survey

School Name: _____ My Grade: _____

1. It is useful for me to know about recycling.	o No	o Sometimes	o Yes
2. Recycling is hard to do.	o No	o Sometimes	o Yes
3. I am confused about what I can recycle.	o No	o Sometimes	o Yes
4. I would go out of my way to find a recycle bin.	o No	o Sometimes	o Yes
5. I wish more people cared about recycling.	o No	o Sometimes	o Yes
6. My family cares about recycling.	o No	o Not sure	o Yes

7. Do you think recycling is important? o No o Yes

Please explain why or why not.

_____

_____

STUDENT _____

ECOLOGYCENTER
Healthy People, Healthy Planet

8. Write the letter **R** by those items you think belong in RECYCLING cart at school.

_____Piece of paper 

_____Paper bag 

_____Paper plate 

_____Paper towel 

_____Empty juice box 

_____Pizza Box 

_____Empty milk carton 

_____Cardboard box 

_____Plastic toy 

_____Aluminum foil 

_____Yogurt container 

_____Candy wrapper 

_____Plastic bottle 

_____Plastic bag 

_____Sandwich bag

_____Plastic spoon 

_____Styrofoam cup 

_____Banana peel 

_____Battery 

_____Old clothes 

_____Glass jar 

_____String or yarn 

_____Potato chip bag 

_____Bottle caps 

_____Pop can 

_____Soup can 

_____Go-Squeeze Pack 

_____Straw 

_____Magazine 

04.26.2017

To

Washtenaw County Schools

It has been a pleasure working with you on the Washtenaw School Recycling program this year. Now it is time to take a look at how this program succeeded and what could make it better!

I am gathering **Student Post-Survey** data and **Staff Surveys** from all schools who have participated in this program during the 2016-2017 school year. These data are intended as a measure of student beliefs and knowledge about recycling at this point in time and to solicit feedback from staff about the recycling program. The results will be used in conjunction with waste audit data to determine how we can improve the program next year. I have provided 60 copies of the student survey and 15 copies of the staff survey. The questionnaire may appear familiar to the students because it is very similar to the document they may have completed earlier in the year. It is not necessary that the same students who did a pre-survey are the ones that complete the post-survey – we are looking for a representative sample of students from your school.

I will need to collect the completed student and staff surveys. I would appreciate your help in administering them to students. I have provided envelopes to collect the completed forms**. I will return to pick them up on MAY 5, 2017**.

Feel free to contact me with any questions or concerns.

Regards,

Katy Adams
Education Director

Ecology Center

Tel 734-709-4947 katy@ecocenter.org www.ecocenter.org

ECOLOGY CENTER

Washtenaw School Recycle Program

PAPER AND PAPER BOARD

CARTONS

METAL

PLASTICS

Place all shredded paper into closed clear plastic bags when placing into carts.

Place all flattened, empty cardboard boxes into the large Waste Management recycle dumpster!