

EarthWays Center SUSTAINABILITY NETWORK

a program of the  Missouri Botanical Garden

Strategies to Reduce School Waste: How Teachers Tackled Real-World Waste-Related Issues



Case Studies and Lessons Learned from the 2017-18 ESN Program Year

The EarthWays Sustainability Network (ESN) is a year-long professional development opportunity that supports educator's in the St. Louis region in learning how to reduce school waste, inspire and engage students in real-world problem-solving, and launch green school initiatives to help reach school sustainability goals. ESN is a program of the EarthWays Center of the Missouri Botanical Garden with funding support from the St. Louis-Jefferson Solid Waste Management District and the Missouri Department of Natural Resources.



PROGRAM SUMMARY



The EarthWays Sustainability Network began in the 2016-2017 school year through a grant through the St. Louis County Department of Public Health, with the stated goal “to better prepare teachers to be the leader in empowering students to take action and solve real-world problems. By connecting with professional educators in the community, EarthWays Center hopes to establish a network of educated, confident, and empowered educators that serve as champions for sustainability at their school.”

For the 2017-2018 school year, the Network continued to grow with support from the St. Louis-Jefferson Solid Waste Management District, allowing the network to expand to schools in St. Louis City, Jefferson County, and St. Charles County. The **four 2017 ESN schools included St. Louis City schools and EAGLE Prep: Tower Grove East, Jefferson County school Sunrise Elementary R-IX, and St. Mary Magdalen from St. Louis County.** Of these schools, two were public schools, one was an urban public charter school, and the belonged to the archdiocese network of schools. EarthWays’ focus for the 17-18 year was to “Multiply the Impact,” by putting tools and

training in the hands of educators, thereby enabling them to develop more impactful solutions tailored to best fit their specific school community. We continue to move away from the model of EarthWays staff as keepers of all sustainability knowledge and outside experts, to a network of empowered educators who serve as sustainability champions in their school and the professional educational community.

Based on the experiences of the 2016-2017 network year, EarthWays staff found that **sustainability gains a foothold in schools when it is a component of both culture and curriculum**, and is based on many strong relationships between staff, faculty, administration, students, and families. ESN seeks to build cultures of sustainability by putting power in the hands of the teachers through the idea of waste reduction. By training teachers in the foundational knowledge of how landfills, MRFs, decomposition, and others work, and through the continued gathering of a library of lesson plans and resources for teachers, the ESN seeks to give teachers the opportunity to tie sustainability in to curriculum, as well as school culture. Stewardship, therefore, becomes a “it’s what we do” mentality for students, families, and staff, rather than a one-time unit of study, which can be a challenging mindset shift given the demands placed on teachers and students. Membership in the Network tends to developing teachers into sustainability champions at their schools, which can become a lonely role. As a third goal, the EarthWays Sustainability Network attempts to build a network of like-minded teachers who share ideas and support one another throughout the St. Louis region.

Each school is unique, and the schools involved in the Network came up with very disparate and specific solutions for their own individual problems. Waste has continued to be a center focus of the program, as it is a resource that is very visible in school systems, can be addressed in a variety of low-cost/no-cost manners. Recycling and waste is an easy hook for students, families, and school administrations and ties nicely with curriculum and learning standards.

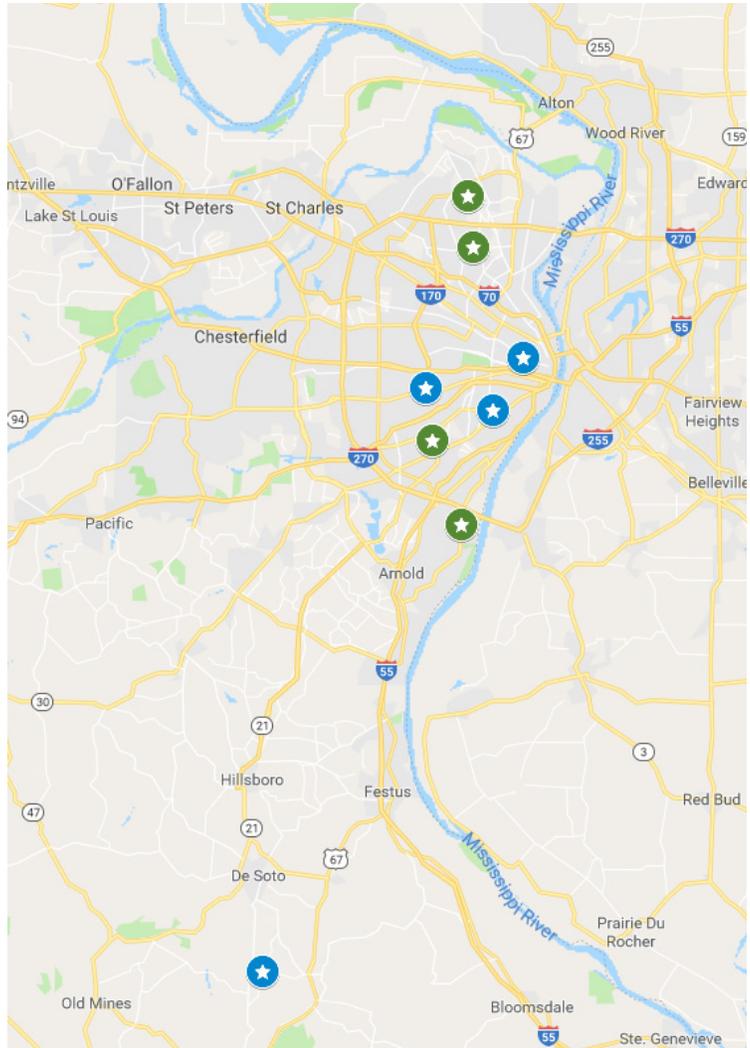
OVERVIEW OF ESN SCHOOLS

YEAR 1: 2016-17 SCHOOLS

-  Gotsch Intermediate School
-  Halls Ferry Elementary School
-  St. Francis of Assisi School
-  Griffith Elementary School

YEAR 2: 2017-18 SCHOOLS

-  Sunrise Elementary School District
-  Carver Elementary School
-  EAGLE College Prep Elementary School Tower
-  Saint Mary Magdalen Catholic School



**Saint Mary Magdalen
Catholic School**

8750 Magdalen Ave. 63144
Brentwood, MO

ESN Teacher
Joni King

Type: Archdiocese of St. Louis; grades K-8

Number of Students: 177

Percentage of Free and Reduced Lunch*: N/A



Sunrise Elementary

4485 Sunrise School Rd,
De Soto, MO 63020

ESN Teacher
Tracy Brosch

Type: Public; grades: K-8

Number of Students: 263

Percentage of Free and Reduced Lunch*: 48.74%



**EAGLE College Prep
Tower Grove East**

2900 S. Grand Blvd.,
St. Louis, MO 63118

ESN Teacher
Toby Loewenstein

Type: Charter; grades: K-4

Number of Students: 143

Percentage of Free and Reduced Lunch 100%



**George Washington
Carver Elementary
Academy**

Location: 3325 Bell Avenue,
St. Louis, MO 63106

ESN Teacher
Brit Tate-Beaugard

Type: Public; grades: PK-5

Number of Students: 246

Percentage of Free and Reduced Lunch 100%

Tie Action to Curriculum, Multiple Touches, Never Stop

-Toby Loewenstein

During the summertime, Toby Loewenstein identified that the curriculum her kindergartners would be using for the school year included units on solid waste. This included discussion of landfills, recycling, as well as understanding ecosystems. She quickly realized that the waste audit and Green Team goals would help reinforce these curriculum concepts routinely. Once the school year began, she and her partner Brittany McPherson implemented curriculum linking Green Team efforts with real, classroom learning.

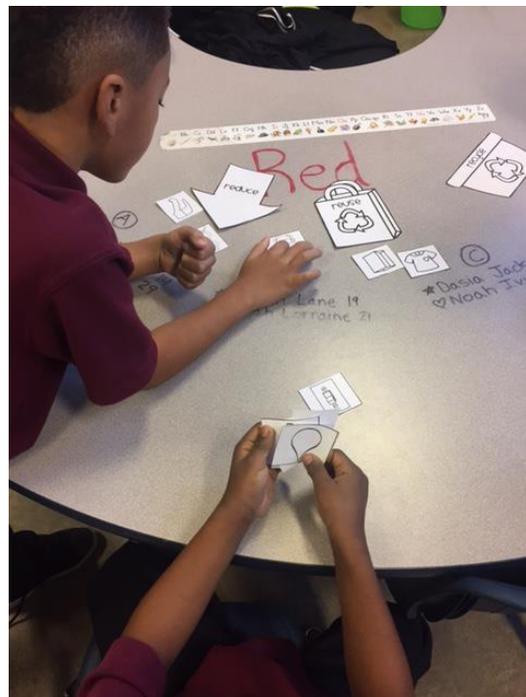
Mrs. Loewenstein found multiple cross-curricular connections to help bridge between activities and concepts. Students read the book *Galimoto* by Karen Lynn Williams about a young boy in an East African village who builds himself a toy vehicle out of scrap wire. These students then learned about how real children in the region make galimotos for themselves, and using reclaimed materials, the EAGLE kindergartners made their own. This approach helped build students' understanding of reuse, recycling, and what it means to be a global citizen.

As the year progressed, it became clear from the waste audit that food waste and plastic film were the two largest sources of waste leaving EAGLE by far, and so Ms. Loewenstein and her class came up with a plan to introduce composting at lunch and to somehow collect film plastic. EAGLE started participating in the Trex Recycling Challenge, collecting leftover plastic wrap from breakfasts and lunch. As part of the Trex program, the Kindergartners created a video* to share with their schoolmates to let them know what can and can't go into the Trex bin.

Composting was a more complicated challenge for the school. Since the school sits on an urban block, with an almost entirely concrete footprint, the only large-scale composting option was to contract with a commercial composting company, which charged a fee for picking up food waste. To help raise funds, students made and sold upcycled milk-carton planters that contained tasty herbs or kale. Through the fundraiser, negotiation with St. Louis Commercial Composting, and outside fundraising the Green Team

was able to get composting funded through May. Starting in January, EAGLE started composting at lunch three to four days a week (depending on the week). To tie this together, Ms. Loewenstein's students also studied how compost worked, observing decomposition in real-time. Thanks to the introduction of commercial composting, EAGLE students reduced the amount of food waste they sent to the landfill by 85%, going from an audit amount of 34.5 pounds at their initial audit to 5.2 at their final audit. In total, they went from 36.1 pounds to 6.5 pounds. At a rate of 3.5 days a week with these reductions, for 20 weeks (from January to May,) EAGLE was able to save 2,072 pounds of lunch waste from going to the landfill.

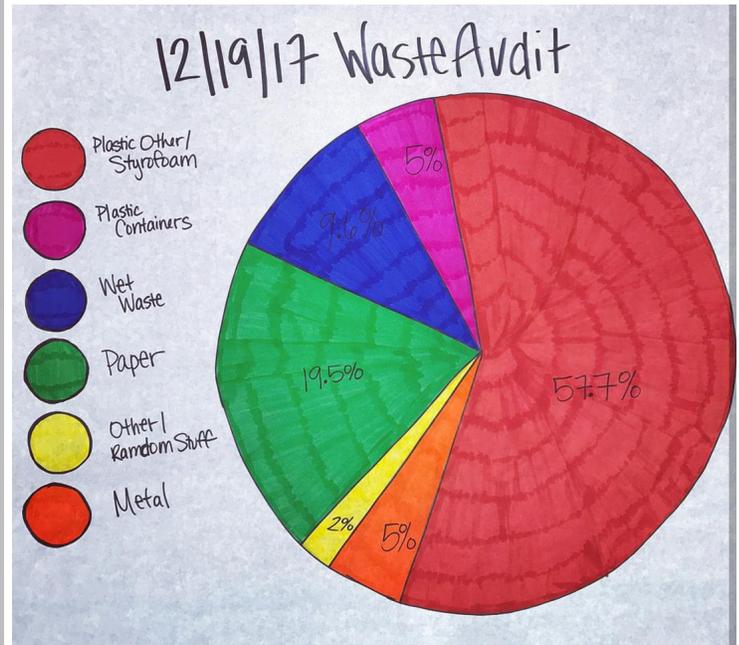
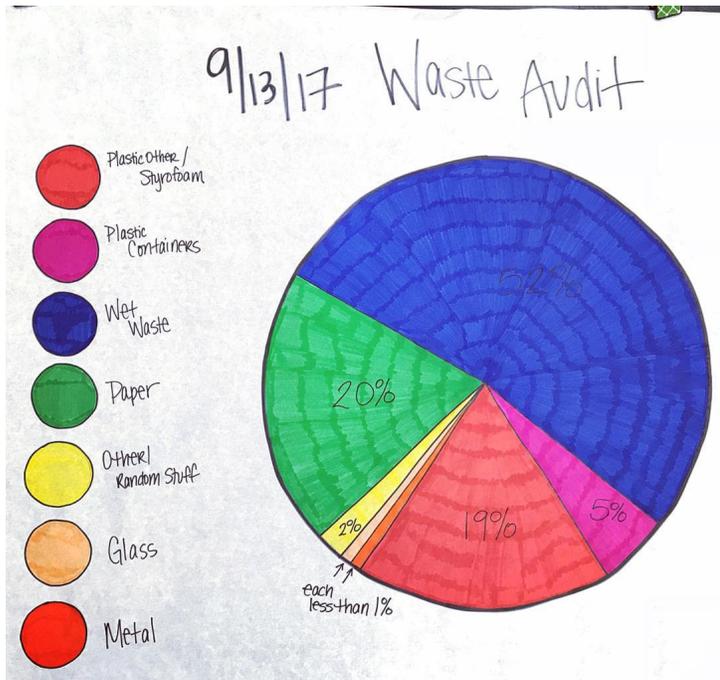
Ms. Loewenstein's curriculum had many ties to waste science, including an entire unit at the beginning of the year. By continually referring back to what the students were doing as they engaged in their waste minimization projects, Ms. Loewenstein helped not only reinforce the concepts but build critical thinking skills as well. She used part of her budget on a clear container that allowed students to observe decomposition in real-time, where a Styrofoam cup buried in soil did not decompose, while a piece of fruit did. In so doing, Ms. Loewenstein created numerous opportunities for students to engage with the actual science involved and make the connections for themselves.



*Student video can be viewed at: <https://www.youtube.com/watch?v=ixS7ZBx6rAs>

Engage All Families and Go All In

-Britt Tate-Beauregard



Participating in ESN was a catalyst for a staggering array of sustainability projects for Mrs. Tate and her Green Team. Following the training, Mrs. Tate's team began moving very rapidly towards finding ways to limit cafeteria waste, as well as ways to help come up with innovative solutions for getting materials for the school garden and arts programs. The initial waste audit revealed that food waste was the major source of waste at the school, and as a result, the Green Team funded a year's worth of commercial composting by selling "Out of Uniform" passes.

During the "Shrink Carver's Waste Line" campaign students created posters to get other classmates to remember to recycle and compost. Furthermore, Green Team students lead the composting and recycling at lunch time, helping to sort and train their classmates on waste diversion, minimizing contamination, and building stewardship and a widespread culture of accountability. Students started learning about jobs in composting and recycling, opening up future opportunities.

At the initial waste audit, 74 pounds of material was thrown out per day. By the follow-up audit, that amount was down to just 34 pounds, cutting Carver's waste footprint in half. Over the course of the year,

this means that Carver diverted over 3959 pounds of waste from going to the landfill at lunch and breakfast. Outside of the cafeteria, 213lbs of plastic bags and film were recycled as part of the TRES program, Students collected 1,128 old markers to be sent to Crayola for recycling, and Recycling bins were placed in every classroom, with Green Team members sorting and taking out to the bins 3 days per week. Custodians joined in the efforts, as the amount of trash they had to haul dropped dramatically—just by instituting composting at lunch, the amount of food in the trash bags went from 38.8 pounds to 1.8 pounds. Bulletin boards are now painted instead of covered in paper to reduce paper waste. Carver also hosted numerous Zero-Waste events, including a "zero-waste lunch," where all serviceware was compostable (which has administration investigating alternatives to Styrofoam as a permanent solution), and student volunteers sorting all waste at the Father-Daughter Dance and Winter Carnival.

To bring this new approach into the curriculum, Mrs. Tate and her art students engaged in several creative up-cycling projects. Using empty milk cartons as light-weight hanging pots, students planted seeds to start growing before transplanting them to their school garden in the spring into compost donated by St. Louis Composting. Old single-use water bottles were

turned into colorful mobiles, and errant marker caps became the pieces in large mosaics. Several partnerships were built out of Mrs. Tate's work in ESN—she was encouraged to participate in the Green Schools Quest, and was paired with the Green Dining Alliance, a local environmental restaurant certification program, Program Manager Jenn DeRose, who helped guide and spearhead efforts at the school to move away from Styrofoam and other best practices for low-waste kitchens.

Thanks to EarthWays introductions, Ms. DeRose's connections, and Mrs. Tate's tenacity, Carver received soil from St. Louis Composting, large recycling rolling carts from STL City Recycles packets of seeds from City Greens, discount on compostable trays from Garrett Paper, and plant starters from Gateway Greening. In addition, several of the water fountains at Carver had tested positive for lead in 2017, and so children had been bringing in single-use water and soda bottles. The Green Team and area partners like BJC, The St. Louis Rowing Fanatics, Climb So Ill, EarthWays Center, STL City Recycles, and Republic Services were able to collect over 700 water bottles, and The Royale, a nearby Green Dining Alliance Certified restaurant, donated the use of their commercial dishwasher to wash the used bottles, so students can now fill water bottles at home, bring them in, and continue using them each day. In addition, the school used this momentum to purchase filtered water bottle filling stations. Towards the end of the year, administration began to be concerned about the health risks of the compost totes, and talked seriously of ending the program. However, Mrs. Tate and her Green Team were able to secure a power washer to clean the totes after each use, securing the survival of the program

Ms. Tate realized that the families of her students engaged more often with social media than emails or phone calls, and began reaching out by featuring students in posts. Families shared this with their contacts, and students felt pride from being involved with helping Carver make less waste. This positivity built momentum for the waste reduction efforts overall, which strengthened Carver's work. Each school community is unique, and your school may have a policy against sharing student images online. Instead, the practice is to find the best way to reach parents and families, and consistently share the positive, holistic, outside-the-classroom angle on their child.

A lot of the time, it's wise to slowly build a Green School program, starting with a successful recycling program in the classroom or composting one day a week in the cafeteria, and then going from there. That said, adopting the approach of using the momentum of each project to launch a major overall of your school community's self-image can win you many partners and open up opportunities a lot faster. If you do choose this approach, be sure to be thorough—you may be a person with many ideas, but it's the execution of those ideas that matters most. If an idea doesn't work out after you've done the research, that's fine, but be sure to execute as many of the projects as you can.

Establish School-Wide Systems

-Tracy Brosch

Ms. Brosch serves as the teacher for the Gifted and Enrichment Programs, as well as the Agriculture Lab, and Sunrise's Garden. As a result, she chose to build her Green Team from the students who had self-identified a passion for ecosystems by joining the Garden Club. These were students in grades 1-5, who in addition to helping plant and build their school's garden, planned to tackle issues in waste.

In 2016-2017, Ms. Brosch and student volunteers had begun school-wide efforts to minimize cafeteria waste, which helped to mitigate 1,890 pounds of cafeteria waste over the school year, by having students separate out their milk cartons, other recyclables, and compost. Given Sunrise's rural setting, the Agriculture Lab was able to take fruit and vegetable waste and compost on-site. Students also brought food scraps from home to feed to worms as part of a vermicompost program. In 2017-2018, the system continued to work, and to provide the Garden with soil, so Ms. Brosch and the Green Team decided to focus their efforts on minimizing waste in the classroom.

After conducting their initial waste audit, Green Team members made a project kick-off educational video*.



This video was shared at an assembly, introducing TREC as a separate component, to help cut down on Ziploc bag waste. It also became clear that teachers were playing a role in under-recycling, and so Ms. Brosch helped develop a staff professional development. Classroom teachers participated in training on recycling properly. Once the kickoff began, each green team member was assigned a classroom (not their



own classroom) to inspect at the end of each day, to make sure recycling isn't thrown away. Classrooms that had no contamination, and no recyclables in the landfill trash, received stickers and commendations for their efforts to reduce waste, this project helped create an overall culture of responsibility and ownership for the different groups using the school building.

Ms. Brosch and her Green Team built off of the momentum from the 2016-2017 school year, when students of all grades worked together to minimize cafeteria waste and won 3rd place in the U.S. Green Building Council-Missouri Gateway Chapter's Green Schools Quest competition. During this previous year, administrators had become very enthusiastic about the Green Team's efforts to make sustainability improvements, and across the board, sustainability became a part of Sunrise's reputation. Before implementing the program, Ms. Brosch and her students made sure to communicate with teachers, custodians, hall monitors, and administrators, to make sure that this effort was something the whole Sunrise community was participating in. Having students from all grades involved reinforced the idea that sustainability is a community-wide endeavor, and once the system began, classes were able to communicate with their assigned member. This became a system of accountability, rather than judgment, as teachers and students held themselves accountable, and inspections were silent and objective—there either were recyclables visible in the trash or there were none. Teachers and green team monitors knew they could communicate with Ms. Brosch if there was a question, and also knew that the whole school was involved, making the network strong.

*<https://www.youtube.com/watch?v=DhSSCmgMDyo&feature=youtu.be>

CHALLENGES & NEXT STEPS

While all three of the projects were quite successful, and the ESN network promises to have ripple effects throughout the education community, the 2017-2018 school year was not without its challenges, both for EarthWays staff and for the individual schools. The largest of the challenges are summarized below:

Continuity and Consistency | As often happens, ESN teachers are a committed and creative group. In several cases, they each came up with many great and inventive projects, and put many in place, but two issues arose: what happens if there are too many projects? Also, what happens when the key teacher leaves or gets burned out? In most cases, both were resolved by placing more responsibility with the Green Team, who in turn pass the most efficient systems on to their peers, but the process needs to be intentional, with ESN teachers being mindful of making sure to spread the work around as the project goes on. Working with outside partners also tends to help.

Communication | Clear communication between students, administrative staff, faculty and teachers during the course of the project is important to help the school culture shift towards sustainability. Successful communication strategies help ensure the whole school is onboard and engaged in the process. Clear, simple messaging that is repeated throughout the duration of the project can help ensure project successes and encourage others to participate or adapt stewardship practices promoted through the project. St. Mary Magdalen was originally part of the network, but the lead teacher eventually found that it was too difficult to keep up with starting a Green Team along with developing a new curriculum. For an extended period of time, there was no response at all from her, despite emails, calls, and emails to her administration, which caused some delay in the overall success of the Magdalen work.

Champions, Communities, and Administration Support | Each school had a unique situation. In some cases, families were on board with the efforts to reduce waste and make the school greener. Further, when families did buy into the idea of sustainability in school, it was through either the lens of students learning more, or through pride in their children's accomplishments. Bureaucratic support is also key. In some situations, administrators, food service, and custodial staff were on board with teachers introducing new waste reduction systems. In other cases, they viewed it as an extra responsibility at best, and a smelly problem at worst. This led to some dissonance when it came to building a culture of sustainability. In all three cases, the culture grew more in the direction of implementing the systems long-term, but especially compost at lunch will require a champion in each place.

Next Steps | This year our goal was to continue to grow the interactions between the teachers involved in the program and expand the program to include a greater number of eligible schools. While there was some measures indicating that the relationships between the first and second cohorts of ESN teachers, this is one area that EarthWays will need to continue to be strategic in how we accomplish building the ESN program. Mike Herries was the main teacher from the 2016-2017 school year to stay engaged with this year's Network. One of the 2018-2019 schools will be St. Joseph Manchester, whose principal taught with and was inspired by Mr. Herries. Personal relationships make a big difference in the continued strength of sustainability projects, and combating the isolating feeling of being the only sustainability champion in a school. That is vital to the success of this Network. As mentioned above, one of the biggest strengths of any program is the establishment of school-wide systems - but also celebration of success. The schools in this year's Network will continue to serve as rising stars and examples of like schools region-wide and encourage others to integrate projects throughout the school system. EarthWays looks forward to finding new ways to recognize teachers, schools, and students for their successes and share this information across the region with other teachers.