



Missouri Green Ribbon Schools Nomination Form

School Contact Information

School Name: Green Trails Elementary	Street Address: 170 Portico Drive	
City: Chesterfield	State: MO	Zip: 63017
Website: https://www.parkwayschools.net/Domain/13	Facebook: https://www.facebook.com/GTElementaryChesterfieldMO/	
Principal: Rene Sommers	District: Parkway School District	
Principal Email: rsommers@parkwayschools.net	Principal Phone: 314-415-6251	
Lead Applicant and Position (if different): Erik Lueders, Director of Sustainability & Purchasing		
Lead Applicant Email: elueders@parkwayschools.net	Lead Applicant Phone: 314-415-8278	

School Characteristics

Level <input type="checkbox"/> Early Learning Center <input checked="" type="checkbox"/> Elementary (PK - 5 or 6) <input type="checkbox"/> K - 8 <input type="checkbox"/> Middle (6 - 8 or 9) <input type="checkbox"/> High (9 or 10 - 12)	School Type <input checked="" type="checkbox"/> Public <input type="checkbox"/> Private/Independent <input type="checkbox"/> Charter <input type="checkbox"/> Magnet	How would you describe your school? <input type="checkbox"/> Urban <input checked="" type="checkbox"/> Suburban <input type="checkbox"/> Rural	Total Enrolled: 440 Graduation rate: NA Attendance rate: 96.5
Does your school serve 40% or more students from disadvantaged households? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			
% receiving FRPL: 11.9%	% limited English proficient: 17.3%	Other measures: 30% mobility rate	

Summary Statement

Building a culture of sustainability and health at Green Trails has been a journey. It began many years ago with a question: “Why do we leave lights on after students leave the building?” We started by turning off lights and unplugging appliances and saved about \$8000 in a single year and there was no turning back

Since 2010 Green Trails has reduced energy use by 31% and greenhouse gases by 31%. One of our energy projects was to add a 25 kW Solar PV array on the roof, which generates a little over 5% of our energy use. There is a monitor in the front lobby of the school that actively displays the energy production levels throughout the day and the data is also available on our website. Also, as building upgrades happened we used the relevant building efficiency construction practices, installing high efficiency HVAC units, increased insulation and LEDs.

After energy conservation, parents and staff became interested in a school garden, which has impacted both health and learning at our school. In 2014, our community came together on a Sunday to build 80ft x 45ft Green Trails Community Garden. We installed raised beds with composted soil, deer fencing, mulch, a shed and an educational information board. We now have a demonstration compost station, a sandbox, a pollinator bed, a watering system and an herb garden. Instead of chemicals we use a vinegar-water blend and weed barriers such as newspaper, cardboard and fabric. In 2015, a separate perennial fruit and berry garden was installed. Also in 2015 we were recognized as a Certified National Wildlife Habitat.

We host three community-wide weekend events a year that include planting, weeding, repair/clean up, and winterization. These gardens allow students to see hands on what healthy foods look like, where they come from, where food scraps go, and in turn what can grow from the compost. We knew we were doing well when after harvesting and sampling Bok Choy, we received numerous parent phone calls asking what Bok Choy was and where could they buy it.

The garden is always open to visitors. We have hosted local gardening experts leading home gardening sessions and invited the public. Families partner up to learn, water and weed in the summer months. Many of our families have since started their own chemical free gardens and pollinator beds. Educating students and the community has helped create a culture that places a greater value on locally sourced produce and healthier eating.

Healthy living is the way we now do things at Green Trails. What other school could eliminate birthday cupcakes and cookies to be met with joyful screeches from our students when they learned they can go outside instead? When we raised the idea of doubling our recess time outside, teachers were worried there would not be enough time to complete the academic content requirements of the school day. They quickly discovered it was easier to teach with more focused and happier children. Plus, we experienced an overall decrease in office referrals by almost 19%.

We have been collaborating with our school district’s Nutrition Services Department to utilize our fresh produce in school lunches. Examples include serving our own sweet potatoes as baked fries or our homegrown kale in vegetable smoothies. Students have participated in tasting and cooking demonstrations such as making pesto. Displaying whole foods has helped our students understand what a real pear, eggplant or sweet potato looks like. Our student-picked produce is provided free of charge to all in the cafeteria.

After studying compost, a group of school leaders requested a demonstration vermiculture / worm composting bin to care for. They monitor and adjust moisture levels and add food scraps to keep the worms healthy. In the spring we plan to relocate the worms outside and put them in the vegetable beds to enhance the soil further. Modeling a closed loop system provides a truly systems thinking opportunity for our students.

Through their Sowing Seeds project, students harvest, package, illustrate with their own artwork, and research/write planting instructions for each seed packet. These packets will be given to older adults through our “Grandfriends” partnership with a senior center and local church, and also sold to community partners to ensure pollinator gardens are being grown throughout our community. Who would have thought young children could teach older adults? Another example is a service project for which our students photographed themselves performing exercises, wrote out the exercise steps on cards, and gave the seniors the cards on handy rings after demonstrating the exercises in person. The children are teaching others about what they have learned about healthy living!

Another way our students take reducing our footprint seriously was highlighted when Green Trails partnered with 10,000 Pencils, an upcycling school supply project. Student leaders facilitated a school supply drive where hundreds of pounds of used crayons, pencils books, paper, notebooks and other items were donated to students in an urban St. Louis school district and a Zambian school. This has brought a global connection to our students about both saving resources and helping others in need.

Here at Green Trails we are truly committed to Whole School Sustainability. We actively seek to educate students and the community about reducing our environmental impact, healthy living and helping others. This has led to genuine environmental leadership by students. The concept of closing the loop and systems thinking has then been applied to many other projects such as reducing energy use, renewable energy, recycling, composting, health, wellness and indoor environmental quality. We’re proud to have been able to transform a school culture and created a movement all stemming from turning off lights and planting a garden.

Cross Cutting Questions

1. Team

Rene Sommers, Principal; Teachers: Chip Darr, Marianna Distel, Custodian: Reginald Cathey, Students: Emmett P, Mason M, Eugene, Hannah M, Abby S. Parents- Brian Hoff, Michelle Wilson, April Bloom and other parents as this role rotates from year to year, District Staff - Erik Lueders (Director of Sustainability & Purchasing), Scott Bennett (Manager of Planning & Engineering), Juliette Travous (Manager of Environmental Services), Robin Wallin (Director of Health Services), Marlene Pfeiffer (Director of Nutrition Services), Erin Schulte (Coordinator of Guidance, Counseling, and Character Education)

2. Benchmarking

Green Trails Elementary uses Energy Star Portfolio Manager and has achieved an Energy Star score of 75 as of February 2018, and is applying to become Energy Star certified. This time 10 years ago, the school was rated at a 27. Recent HVAC upgrades meet at a minimum of ASHRAE’s 50% Advanced Energy Design Guidelines. We also used the National Wildlife Federation’s program for a Certified Wildlife Habitat as a benchmarking tool and have since installed various measures and have become a NWF Certified Wildlife Habitat

3. Awards

- National and State School of Character 2017
- Green Trails - Certified National Wildlife Habitat designation #189848 May 2015
- Green Trails- City of Chesterfield Monarch/Pollinator Gardening Award - April 2017
- Least Compost Contamination at a Parkway Elementary School 2016-2017
- School District Scholarship Program (\$20,000) - USGBC Center for Green Schools - 2015

- Outstanding Small Organics Diversion Program Award (District Wide) - MO Recycling Association 2013
- Growing Green Award (District Wide) - USGBC MO Gateway Chapter - 2013
- Energy Star Leader Award 20% Reduction (District Wide) - EPA/DOE - 2013
- Energy Star Leader Award 10% Reduction (District Wide) - EPA/DOE - 2012
- School Recycling Award (District Wide) - American Forest & Paper Association - 2010
- Growing Green Award (District Wide) - USGBC MO Gateway Chapter - 2009

Since 1995, Parkway School District has received 13 grants totaling \$353,000 from St. Louis County and St. Louis Jefferson Solid Waste Management District for recycling, waste minimization, and composting. These funds have allowed Green Trails Elementary to be among the leaders in the state with regards to recycling and composting. Green Trails has also received over \$8,800 in incentive funds from Ameren Missouri to make the school more energy efficient using LED lighting, HVAC upgrades, PC power management and vending misers. Another \$50,000 was awarded for the installation of a 25 kW solar PV array. Additionally, Green Trails was part of a larger district-wide initiative to retrofit all exterior lighting to efficient LED fixtures. This was funded from the Missouri Department of Economic Development’s Energy Loan Program.

4. Goals

1. Reduce the reliance on electricity by optimizing plug load controls to include adding more devices to the PC Power Management program and installing advanced power strips for other devices, installation of sensors to turn off lights when not in the room, and greater use of solar tubes in place of electric lighting
2. Create a rain garden to filter roof run off responsibly and harvest some of this water for use in the community garden.
3. Use our summer harvest more efficiently to help provide fresh produce for Parkway SD Food Pantry.

Pillar I: Reduced Environmental Impact and Costs

ENERGY

1. Energy STAR - Do you track resource use in ENERGY STAR Portfolio Manager?

If yes, what is your score? 75

If score is above a 75, have you applied for and received ENERGY STAR certification? Yes

Year (s): 2018 (February 26)

2. Energy Use

Baseline Year: 2010

Ending Year: 2017

Energy: 10,122.36 kBtu / student

Energy : 6,914.59 kBtu / student

Reduced use: 3,207.76 kBtu / student

% Reduction: 31.69% kBtu / student

% Reduction per year: 4.53% kBtu / student / year

Green Trails Elementary is a part of Energy Star’s Portfolio Manager and actively tracks energy usage each month by inputting utility bill data into the software. In addition to Portfolio Manager, the school utilizes EnergyCAP which is a robust utility analysis software that is able to provide a higher level of insight into the school's energy usage, reduction, normalizing usage against weather, and identifying the school’s base load, among other important metrics. A summary report is generated and shared on a quarterly basis to help maintain awareness of the school’s energy conservation efforts.

3. Greenhouse Gases

Baseline Year: 2010
Ending Year: 2017

GHG Emissions: 1.63 MT CO₂e /students
GHG Emissions : 1.12 MT CO₂e / student
Reduced GHG: 0.51 MT CO₂e / student
% Reduction: 31.23 % MT CO₂e /student
% Reduction per Year: 4.46 % MT CO₂e / student / year

Green Trails Elementary's emissions were estimated by using Energy Star's Portfolio Manager. No offsets were purchased as this is not yet an appealing use of tax resources to our community. We instead invest directly into upgrading our school to be more energy efficient.

4. Renewable Energy

On-site renewable energy generation: 5.85 % Type: Solar PV
Purchased renewable energy: 0 % Type: NA

Green Trails Elementary has a 25 kW Solar PV array on the roof. There is a monitor in the front lobby of the school that actively displays the energy production levels throughout each day. The monitor also has graphics illustrating the solar energy process for an educational opportunity for students, staff, and community members. In addition to the monitor, data generated about the solar array's production is available on the school's website for all community members.

5. Building

Year school was originally constructed: 1967 Total Building Area - 59,174 square feet

While not a certification standard, we used the ASHRAE 50% Advanced Energy Design Guidelines for the renovation of the school's space. Installing high efficiency HVAC units, demand control ventilation, VAV boxes, increased insulation values, and LED lighting using IESNA lighting level guidelines. The school has been upgraded over the years with regards to the capital equipment and assets (HVAC, Flooring, Roofing, etc) for their associated replacement cycles, but no major gut renovation or new addition work has been conducted in recent decades. When those upgrades happen, a variety of LEED related practices that we also do such as install low/no VOC containing flooring and paints, recycle our C&D material, install low flow plumbing fixtures, and recently have installed a pilot project using Sola-tubes which provides natural light to a space that didn't previously have any.

WATER AND GROUNDS

6. Water Use

Baseline Year: 2010
Ending Year: 2016

Water Use (gal / student / year): 1,473.41
Water Use (gal / student / year): 1,304.77
Reduced Water Use: 168.64 gal / student /year
Reduction: 11.45 % gal / student
Reduction per Year: 1.9 % gal / student / year
Reduction Domestic Water Use: 11.45 %
Reduction Irrigation Water Use: NA

Green Trails is part of Parkway School District's portfolio within the Energy Star Portfolio Manager. Water bills are entered into this software as bills are received. The ending year for this calculation was selected to be

2016 for a particular reason. The most recent year (2017) had an unusually high water usage for only one billing cycle as a result of several leaks having been identified. Once identified, these issues were repaired and the spike in usage dropped back to typical use. If not for this spike, we would have experienced a year similar to 2016, which is a measurable improvement compared to the 2010 baseline year.

7. Water Efficient and Regionally Appropriate Landscaping (WERAL)

Total Area: 560,113 square feet WERAL Area: 8700 sq ft. % WERAL: 1.6%

Water Efficient Plants: various ornamental grasses, purple coneflower/Echinacea, Black-eyed Susan, lavender, tall native garden phlox, prairie milkweed

Regionally Appropriate Plants: indigenous blue salvia, blazing star, Virginia Sweetspire, various prairie grasses, various milkweed species, butterfly weed, beebalm, blue false indigo, prairie clover, purple coneflower, wild geranium, prairie sunflower, goldenrod

We were honored as a Certified National Wildlife Habitat, 2015. In addition, drought tolerant prairie grasses & native Virginia Sweetspire replaced Asian yews; more grasses were installed to combat water runoff; 3 pollinator gardens were planted to encourage pollination in the community and our vegetable/fruit gardens. We removed invasive honeysuckle in landscaping/woods.

8. Alternate Water Sources

We have received and will install rain barrels for the purposes of our outdoor vegetable garden to utilize the runoff from our large roof to water the vegetable garden. We are excitedly anticipating their installation when it warms up.

9. Runoff

There were two areas near our carpool drop-off experiencing significant inundation, mud and debris and soil erosion after rain. Students suggested plantings to absorb water, so we planted prairie grasses. Additionally, there were two “islands” containing debris contributing to runoff. Students and grounds personnel planned/installed native pollinator gardens, to absorb rainwater, slow runoff, and prevent erosion.

10. Ecological Beneficial Uses

Total Area: 560,113 square feet EB Area: 163,786 square feet % EB Area 29%

We have installed a pollinator garden within two parking islands to promote monarch butterflies. There is a vegetable garden, a perennial fruit tree garden, and a outdoor classroom. We also have a wooded area behind the school that is used by staff and students to integrate into the curriculum. For example, during the K Five Sense unit, students take nature walks in the woods using their five senses and recording their observations.

WASTE

11. Solid Waste – Has your school diverted some of its solid waste from a landfill through recycling and composting, and/or has it implemented practices to reduce waste at the source (source reduction)?

Monthly garbage service in cubic yards: 34.64 cubic yards

Monthly recycling volume in cubic yards: 69.28 cubic yards

Monthly compostable materials volume in cubic yards: 12.35 cubic yards

Recycling Rate: 70.21%

Monthly waste generated per person 0.07 cubic yards

Ninety percent of tableware used is compostable, including trays, individual serving containers and soup bowls. Students have been trained to sort waste for composting, recycling and items for landfill. All students and staff have been given reusable water bottles and bottle fillers are installed. We require two sided printing and use Chromebooks to reduce paper usage and waste.

12. Hazardous Waste - Does your school have a program for tracking, managing, and safely disposing of hazardous waste, and/or for systematically reducing the amount produced?

How many gallons or lbs. does your school currently have of each of these classes of hazardous materials?

Flammable liquids: 0 Corrosive liquids: 0 Toxics: 0 Mercury: 0 Other: 0

Hazardous Materials are tracked, managed and disposed of through the district's Environmental Services Department (ESD). Waste materials, lab waste, and art waste, etc. are disposed of through licensed waste haulers and EPA permitted disposal sites. Science chemical inventories are kept at the school level and reviewed by the district's ESD. Parkway has a mercury reduction program where mercury containing science and health equipment has been removed from the school and replaced with electronic equipment. The district's Environmental Services Department worked with the Missouri Department of Natural Resources to properly remove and dispose/recycle the mercury in this equipment.

13. Green Cleaning - Does your school use a green cleaning custodial standard?

- Which green cleaning custodial standard is used? Green Cleaning Guidelines and

Specifications for Schools, 2009, Missouri Department of Elementary and Secondary Education

- What % of your products are certified? 51% if including floor finishers and sealers. 91% if excluding floor finishers and sealers

- What specific 3rd party certified green cleaning product standard is used? Green Seal, EcoLogo, Design for the Environment, California Air Resources Board, Carpet and Rug Institute

14. Electronic Waste - Does your school recycle electronics in an environmentally responsible way?

All of our electronics including desktops, laptops, monitors, peripherals, projectors, batteries, phones, CRTs, light bulbs, ballasts, motors, among other equipment are repurposed or recycled at the end of their useful life. Items are either sold to the public at govdeals.com or recycled with a registered e-scraper recycling vendor.

TRANSPORTATION

15. Alternative Transportation

Green Trails Elementary utilizes school buses for student transportation. 78% of the total enrollment participate in this option. Our school bus fleet has completely phased out all older diesel engines that had higher emissions (model year 2007 and prior), participating in the EPA's Clean School Bus program. In addition, 44% of the buses are fueled with compressed natural gas (CNG), a cleaner alternative to diesel.

16. Accommodations for alternative travelers

Students who reside within 1/2 mile of Green Trails live in a designated walk zone, so bus service is not provided and students are encouraged to walk to school. There are two bike racks available to all students. The Chesterfield police present a helmet safety program yearly, and children are fitted for helmets. There are 6 designated “Walk to School Days” exciting students about walking. Community members such as older adults and the Chesterfield Police participate, illustrating our commitment to health/wellness. The neighboring church .9 miles away, donates the use of their parking lot and contributes drinks for walkers.

PURCHASING

17. Paper

post-consumer recycled content paper: 100 % paper from FSC forests: 0 % chlorine-free paper: 35 %

All copy paper is 30% recycled content. All paper towels and toilet tissue is 100% recycled content, Green Seal Certified, and processed chlorine free.

18. Food

Produce food items for the salad bar are 23% locally sourced. Foods sourced locally are Basil, Beets, Corn, Black Berries, Cabbage (Green and Red), Cucumbers, Eggs, Mustard Greens, Peppers (Green, Red and Yellow), Tomatoes and Watermelon. Produce from the school garden is used as it is available.

OVERALL ENVIRONMENTAL IMPACT

19. Environmental Impact Summary

Three years ago we installed a large community garden that allows hands on learning experiences. Students and families are involved in planting, weeding, harvesting and seed reuse. Students are able to see the effect of a closed loop system, from compost and seed, to edible food and food scrap. They see the results as items are offered in the cafeteria, resulting in students who are more willing to try new healthier foods.

Beyond composting, we actively work to recycle not only single stream items, but also all of our electronics scrap items, lighting bulbs and ballasts, construction and demolition scrap metal, and old carpet. Old furniture that can be reused is either redistributed throughout the district or sold on GovDeals, which allows those items a second life.

Last summer the school had major HVAC improvements that utilized ASHRAE’s Advanced Energy Design Guidelines which resulted in an Energy Star rating eligible for recognition. This is combined with efforts such as exterior and interior LED lighting upgrades, and a 25 kW solar PV array

We have installed dual flush valves on toilets and low flow aerators on all faucets to reduce water use in the building.

Pillar 2: Improve the health and wellness of students and staff

ENVIRONMENTAL HEALTH

1. Water Sources

Green Trails Elementary receives its water from the local utility, Missouri American Water, which samples and analyzes its water supply frequently for Clean Water Act contaminants. A parkway school district building is one of their testing sites where they collect their routine water samples that represents their larger water system.

2. Drinking Water

Green Trails has implemented a lead in drinking water program utilizing EPA's 3T's (Training, Testing, Telling) for Reducing Lead in Drinking Water in Schools Program. Where lead was analyzed greater than 15 ppb, remedial actions, such as replacing the faucet and piping occurred, and the equipment was resampled.

3. Moisture

For controlling humidity, HVAC systems are checked along with sources of moisture from the roof, plumbing, exterior walls, etc. Personnel use moisture meters to check walls, ceilings, floors and furniture for excess moisture. The Environmental Services Department (ESD) has an IAQ complaint process for the schools to use for concerns. For monitoring and controlling mold, ESD investigates IAQ issues including signs of mold. Air quality readings including temperature, relative humidity, carbon monoxide and carbon dioxide are taken regularly. ESD works with maintenance and custodial to ensure proper cleanup and repair. Contractors may be used for mold removal and/or duct cleaning if a mold source is found.

4. Ventilation

For inspecting and maintaining the ventilation system, HVAC equipment is connected to a centralized buildings automation system that is actively reviewed to ensure proper operations. All equipment has a twice a year preventative maintenance program. All units are equipped with high efficiency air filters that are at a minimum of MERV 8 or 9 depending on filter type. Green Trails utilizes HVAC technicians to ensure all HVAC systems are operating and well ventilated per ASHRAE and St. Louis County standards. CO and CO2 measurements are taken regularly. Larger spaces utilize CO2 sensors to identify when more fresh air is required and when energy can be saved by re-circulating conditioned air.

5. Airborne Contaminants

Fresh air intakes are located a minimum of 10 feet away from any vehicle areas or exhaust stacks per code requirements. All buses and maintenance vehicles participate in a no-idling policy and refer to St. Louis County Health Department ordinance 312.340 and Missouri State Regulation 10- CSR 10-5.385. All new paints, furnishings and floorings have low or no VOC content in order to reduce indoor air contaminants and prevent triggering asthma attacks.

6. Integrated Pest Management

Volume of annual pesticide use: 0.0005 gal/student/year of chemical (non-diluted). An on-staff licensed pest control technician is trained in IPM procedures. EPA restricted pesticides are not used. The district pest technician works with staff to reduce pest entry, food sources, and cleaning procedures. Staff complete annual training on IPM practices. The technician identifies pests. Staff keep the pest for inspection or take a photograph for identification. The Missouri Dept. of Agriculture and St. Louis Zoo Insect House have been used as a resource when needed. Work order systems are used to track monitoring, inspections and pest

applications as well as standard preventative maintenance activities such as bait stations, traps, and stinging insect inspections.

7. Chemical Management

Green Trails has a smoke free policy including e-cigarettes, which include the campus, district vehicles, and buses. Mercury containing equipment in classrooms, thermometers, barometers, psychrometers and blood pressure cuffs in the nurse's office were removed and disposed/recycled through the MD. If mercury equipment is discovered, the ESD is notified and it is removed from the building. All areas/rooms in the lower levels and/or that have contact with the ground have been tested for radon in conjunction with the Missouri Department of Health and Senior Services. Bellerive also has access to two electronic radon detectors that can be used to test for radon as needed and follow up purposes. Playground equipment made of CCA treated lumber was sealed until it was replaced with non-CCA equipment. The District ESD utilizes EPA's Tools for Schools for indoor air quality inspections and remedial actions if needed. All operations departments are involved in the IAQ process including ESD, maintenance, custodial, roofing and grounds.

NUTRITION AND FITNESS

8. Healthier US Schools

We participate in the Jump Rope for Heart Program run through the American Heart Association. Each February, students challenge themselves to improve their fitness through jump roping. Students practice different jumps to increase their endurance. Our goal is 100% participation, which we have met in 2015-2017, and personal best scores (rather than focusing on fundraising). Our school also participates in the Fitnessgram Assessment Program. Students are assessed yearly on aerobic capacity, flexibility, muscular strength and endurance. We monitor progress quarterly and students work to improve their score from prior years. Last year 76% of 3rd-5th grade students met their goal.

9. Healthy Foods

Our garden or salad bar items are all locally purchased. The garden bar or salad bar makes up about 75% of our menu choices. We offer a main entree daily. Students are free to make their combinations of the 5 components either off the garden bar or the hot line. Students may choose a protein selection from the main line, but complete their meal with the remaining selections, of grain, fruits, vegetables and dairy by choices from the garden bar.

10. Fitness and PE

minutes P.E.: kindergarten 150 min/week; 1st and 2nd- 140 min/week; 3rd-5th 110 minutes/week
outdoor P.E.: 45%

Every possible opportunity is utilized to be outside for individual and team sports. Examples include: kickball, frisbee golf, endurance running, soccer, flag football, invasion games, and basketball. A 1/3 mile fitness track has been installed and utilized daily when the weather is appropriate. Lifetime fitness activities encourage a love of being active and which can be participated in even as an older adult, such as walking, gold aerobic training. Our staff applied for a received a USGA golf kit used to introduce and teach all grades about golf in a developmentally appropriate way.

11. Outdoor Safety

Green Trails utilizes St. Louis Regional Clean Air Partnership's Air Quality Forecasts; a color coded system based on EPA's Air Quality Index: Green (no problems), Orange (some risk for those with sensitivities) and red (high risk). Outdoor activities are adjusted or brought inside based on forecasts. Playgrounds are inspected annually by ESD's licensed inspector and weekly inspections by custodians. Teachers and custodians receive yearly training in playground safety.

12. Outdoor Activity

Students can walk a lap around the track to help them get ready for learning. We recently increased daily recess outdoors from 15 minutes to 40 minutes daily with decreases in office referrals compared to the same months last year. Through a two year community fund raising effort, we installed a new playground equipment. We also have a Literacy Garden with space for students to sit on boulders and read/write. So everyone can go out in the cold, we have a glove/hat/mitten/scarf donation drive for those receiving free/reduced lunch supported by a local synagogue.

COORDINATED SCHOOL HEALTH PROGRAM

13. Health Education

Green Trails children experience an integrated approach to health and wellness. We practice frequent movement/sensory breaks to support brain development. The PE program allows students to set and monitor goals in the areas of fitness and nutrition. In addition to ongoing formal assessment, students self-assess. Activity monitors are used for student goal setting and monitoring of activity throughout the day. We use USDA My Plate as a tool to teach students about healthy diet choices. Students are assessed in health each trimester and transfer learning by picking from food groups in the cafeteria in alignment with My Plate.

14. Health Services

Annette Polzin, BSN, RN, NCSN is our Nationally Certified School Nurse. Her services include addressing first aid and emergency care, managing health conditions through direct nursing, medication and treatment administrations and care. Other activities include flu vaccine and dental clinics for students, staff and families. Ms. Polzin facilitated flu vaccinations for 57 staff members, students, and their families. Other activities include screenings for vision and hearing, ensuring that students who need referrals have access to no/low cost options. This school year she has provided the following staff development: CPR, food allergies, EpiPen administration, and infection control.

15. Mental Health

We build relationships and teach character via weekly assemblies, daily meetings in every class and cross-grade "family groups." Lessons are taught about bullying and being an ally rather than a bystander. We've created lessons on how to work and play peacefully: I-statements when frustrated with others, active listening skills, respectfully responding, playing positively, and including all. A child sitting on the Buddy Bench tells others they need a friend. We provide/teach a Take a Break station in every room for students to calm, re-center or be mindful. A therapist through the Children's Service fund provides therapy 2x/week.

16. Employee Wellness

Green Trails' Wellness Leader, Annette Polzin, works in collaboration with the district to provide staff opportunities to promote health and wellness. Activities include promoting Women's Health Month activities

and screenings and district-wide biometric and cancer screening opportunities. We have offered The MIND Diet course for staff interested in improving their nutrition. Other district-wide wellness challenges are embraced to encourage nutrition and physical activity, including healthy cooking demonstrations, fitness rooms and personal training available to district staff. Twice a year, massages are provided for Green Trails' staff free of charge.

17. Community

Our partnership with a senior center allows students a real life way to share their exercise knowledge. Students photographed each other, created exercise direction cards and traveled to teach older adults how to safely do exercises. We have built a partnership with a local church. They bring bags of food for nine families every week for weekend meals. They also have donated funds for student lunch accounts who usually do not eat dinner and can't afford extra food. They support our Walk-to-School Days with water/juice/coffee. Local dentists visit to provide dental health lessons and toothpaste and new toothbrushes.

18. Family

Green Trails is an English Language Learning Center; parents are encouraged to drop in during lunch, play at recess or read to children. Parents from diverse backgrounds are part of our PTO related activities; they run our school store, facilitate many seasonal parties and fitness events. There are many opportunities to volunteer, and we host many events to celebrate the diverse population, examples: highlighting various cultures at all school Monday Assemblies, Passport Night, Thanksgiving Around the World. We have also connected our parent community through grade level specific Facebook pages where connections between adults are made and playdates are set.

OVERALL HEALTH IMPACT

19. Health Summary

First, through the Community Garden, students were able to plant and grow foods they would not normally know, but they began to request. We are showing/serving whole foods in our cafeteria, so students who initially had never seen a whole, fresh pear or eggplant, now understand and embrace them. We moved from serving canned pears in syrup to fresh pears. Students have been willing to try baked sweet potato, roasted eggplant, fresh pineapple, sliced radishes and other foods that one would think were ordinary.

Second, this school year we doubled the daily recess time from 15-20 minutes to 40 minutes (20 minutes twice a day). We are already seeing improvements increased focus in classrooms. Last year, a group of stakeholders read *Brain Rules* which asserts exercise improves cognitive functioning. Over the years, we tried ways to inject movement into daily routines, such as brain breaks between subjects. Overall we saw and almost 19% decrease in office referrals. During those months where we are consistently able to be outside daily, the numbers are even more impressive, up to a 31% decrease in office referrals.

Third, it was a tradition for many years to have cupcakes and treats for birthdays. We eliminated this and offer extra recess or blowing bubbles which has eliminated a great deal of junk food from our day.

Pillar 3: Effective Environmental and Sustainability Education

CURRICULUM AND ASSESSMENT

1. Literacy Requirement

Students attend a weekly student-led assemblies, where they present topics via writing pieces and presentations to advocate for environmental issues and initiate service projects. Student leaders are empowered to teach peers how to compost, recycle, reduce waste, and effect of waste on people/environment. There are numerous places within the curriculum for students to research, write and orally communicate regarding sustainability passions. Students develop arguments from various perspectives about the environment, such the importance of recycling, saving oceans from plastics and how humans adversely impact the lives of animals such as ocean creatures and arctic mammals.

2. Environment and Sustainability Lessons

Gr.	Curriculum or Lesson	Subjects (Missouri Learning Standards)
K-5	Service Learning Project Students collected leftover and gently used school supplies and books at the end of the year and donated them to 10Kpencils.org.	Social Studies ELA Persuasive Writing, Non-fiction
1st	Organisms- In this unit, students explore the similarities and differences between plants and animals. They observe living organisms and compare and contrast terrestrial and aquatic plants and animals.	Life Science 1A - Structure and Function ELA- Writing to compare and contrast, Reading non-fiction
2nd	Earth Materials: Soil- Student explore the properties of sand, clay, and humus. Using the results they analyze their own local soil to draw conclusions about its composition. They will learn that composting is the process of recycling organic material and the role of worms in this transformation.	Physical Science 1A - Structure and Properties of Matter ELA - Writing Non-fiction, Persuasive Writing Non-fiction
3rd	Food Chains and Webs- Students will explore relationships among organisms in a habitat. Students will be introduced to food chains as the flow of energy through a habitat.	Life Sciences 1A - Structure and Function and B -Growth and Development of Organisms ELA -Reading non-fiction text structures and comprehension
4th	Water- Students will explore phases of water, the water cycle and different forms of water on Earth (e.g. groundwater, surface water, fresh/salt, flowing/stationary, etc.). Students will describe how human needs and activities affect Earth's water supply. They will also discover the role of water in changes in the earth's surface caused by weathering and erosion.	Earth and Space Scienc 1C - The History of Planet Earth and 2A Earth Materials and Systems ELA - Persuasive Writing, Reading non fiction
5th	Environments- Nature Unleashed Students gain experience with living and nonliving environmental factors in pond, forest, and prairie ecosystems. Organisms maintained in the classroom are used to develop the concepts of environmental factors, range of tolerance, and optimum conditions for survival of populations. Students will identify the ways a specific organism may interact with other organisms or with the environment.	Life Sciences 2B - Cycles of Matter and Energy Transfer in Ecosystems ELA - Writing Non-fiction 5 paragraph essay, Reading Non-fiction

3. Assessments

Gr.	Knowledge Assessed	Assessment Tool	Avg Stud. Proficiency (%)
K	Living Things	Students record observations in their Science Notebook about the growth of a seed into a plant and the life cycle of ladybugs.	100% Understanding* 100% Investigation* 100% Explanation*
1st	Organisms	Performance Task(s): Choose either a plant or an animal and make a plan to care for it	100% Understanding 100% Investigation 100% Explanation
2nd	Earth Materials: Soil	Assessment Questions: 1. Draw a picture of a compost pile and label all the parts. Explain how it decomposes. 2. How do the worms help break down the soil in our compost bags?	88.41% Understanding 95.65% Investigation 86.96% Explanation
3rd	Food Chains and Webs	Performance Task(s): Teach 3 rd graders about the flow of energy between organisms around Castlewood (a local park)	93.85% Understanding 98.46% Investigation 93.85% Explanation
4th	Water	Assessment Question: List three ways human activities affect the quality or quantity of water.	87.2% Understanding 100% Investigation 90.7% Explanation
5th	Environments: Nature Unleashed	Performance Task: Create a picture/video representation identifying examples in Missouri where human activity has had a beneficial or harmful effect on other organisms.	100% Understanding 70.33% Investigation 82.42% Explanation

Understanding - students understand topics and concepts re: environments

Investigating - students plan and carry out investigations related to concepts

Explanations - students analyze and interpret information to construct evidence-based explanations

4. STEM in an Environmental Context

Gr.	Curriculum or Lesson	STEM Standard –
K	Lesson- Create a 3D shape, using IO Blocks, to build an animal that will fit in a specific area.	Engineering, Technology & Science 1B1 Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem.
1st	Lesson- Students plant seeds in various locations and keep other variables the same to determine which locations are best suited to plant growth. Plants are then planted in the school garden or taken home to plant and care for.	Science Process Skills: How growing conditions affect growth Geometry 1B1 Measure lengths in non-standard units, order three or more objects by length
2nd	Lesson- Using MakerSpace Garden Grow Room, plant seeds of the same type in a variety of conditions. Within the different environments, label one plant to be watered once a day, one to be watered	Life Sciences A1 - Plan and conduct investigations on the growth of plants when growing conditions are altered (e.g., dark vs. light, water vs. no water). Geometry B.1 Measure the length of an object by selecting and using appropriate tools. Estimate

	once every 3 days and one once a week. Collect data over the span of 4 weeks.	lengths using different units
3rd	Lesson- Students use a magnet maze to explore characteristics of electricity and then what non-renewable resources are used (or misused) when using electricity.	Physical Science PS2B1 Plan and conduct investigations to determine the cause and effect relationship of electric or magnetic interactions between two objects not in contact with each other.
4th	Lesson- Students use “Makey-Makey” circuit boards and unique objects, such as fruit, to complete a circuit and create an alternative keyboard to control their electronic device. Students learn how to be creative in facilitating energy transfer; we can think outside the box to reuse materials already in our environments to invent new ways to reach the goal.	Physical Science PS3B2 Apply scientific ideas to design, test, and refine a device that converts energy from one form to another. Construct and diagram a complete electric circuit by using a source, means of transfer and a receiver.
5th	Nature Unleashed/Environments (lessons developed by the Missouri Department of Conservation) <u>Human Interactions</u> ; Students will work in groups to make a list of ways humans interact with the environment and the possible effects of these interactions on the environment.	Earth and Space Science 2B Develop a model using an example to describe ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact. and 3C Obtain and combine information about ways individual communities use science ideas to protect the Earth’s resources and environment

5. Green Tech/Careers

Gr.	Curriculum or Lesson	Green Technology/Career Pathway
K	Students observe and record differences in trees and weather throughout the seasons. Students practice sorting their own waste daily into compost, landfill and recycle	gardener, weather forecaster, sustainability specialist
1	Students plant note differences in plants when variables such as location, sunlight, water are changed	gardener, horticulturist,
2	Students explore different types of organic matter (soil, clay, sand, humus) and the effect on plants. Students nurture, observe and record re: butterflies through the various life stages	gardener, wildlife management, biologist (biologist (parent) teaches all of 2 nd grade a lesson to connect these
3	Students plant a seed and observe the life cycle of a plant.	Gardener, horticulturist, biologists
4	Students study the characteristics of vertebrates and invertebrates. Students took a field trip to the zoo. They attended a class presented by a zoologist to learn about vertebrates and their habitats.	Zoologists (students go to the St Louis zoo and take a class to connect these), wildlife management
5	Students learn about living and nonliving environmental factors in pond, forest, and prairie ecosystems and human’s impact on those environments	gardener, wildlife management, recycling

6. A.P. Environmental Science – NA

PROFESSIONAL DEVELOPMENT

7. Certification - For each certification listed below, provide the number of teachers in each grade who are certified and the year certified. Add additional rows as needed.

Certification	Grade (# Teachers) Year; Grade (# Teachers) Year:...
STEM in Residence	K (1) 4th (1)
Math in Residence	4th (1) 5th (1)
Character Education Certification	Counselors (2) 2016, Principal (1)
Green Classroom Professional	District Personnel (1)
Leadership Academy in Character Educ.	Principal (1)
Certified Energy Manager	District Personnel (1) 2014
CPR Certification	(8) Various staff: Nurse (1) PE (2), Principals (2), Support Staff (2) Counselor (1)
Leadership in Energy and Environmental Design Accredited Professional (LEED AP)	District Personnel (2)
Certified Industrial Hygienist (CIH)	District Personnel (1)

8. Workshops Attended

Workshops (Category 1, 2, or 3)	Grade (# Teachers) Year; Grade (# Teachers) Year:...
Envision Math Training (Cat 3)	K(3), 1st (4), 2nd (3), 3rd (3), 4th (4), 5th (3) Support Staff (~7) 2016-17
Math in Residence (Cat 3, 1)	4th (1) Martin Hick split with Cody Burkett (2015, 16, 17)
Stress Management and Reduction Strategies (C2)	K(3), 1st (4), 2nd (3), 3rd (3), 4th (4), 5th (3) Support Staff (~7) 2016-17
STEM in Residence (Cat 3, 1)	K(1), 4th (1) Mike Schmerold, Marianna Distel (2017/18)
Trauma Informed Practices	K(3), 1st (3), 2nd (4), 3rd (3), 4th (3), 5th (4) Support Staff (~5) 2017-18
Sustainability Education Workshop at MICDs	Summer 2016, Rene Sommers
Makerspace/STEM Workshop 1/6/2017	K(3), 1st (3), 2nd (4), 3rd (3), 4th (3), 5th (4) Support Staff (~5) 2017-18

9. Workshops and Lessons Provided

Workshops or Lessons	# Attendees
CPR Training for Staff by school nurse (Annette Polzin)	7
Parents and staff demonstrated to families how to plant vegetables, fruits, flowers.	50+
Families learned to trim tomato plants for proper growth, which items to compost, identify weeds and remove or use vinegar to eliminate, proper watering, etc	20+
Parents and staff demonstrated to families how to harvest lettuces and other vegetables correctly, how to dig up potatoes and other root vegetables, and hay bale gardening	30+

OUTDOOR LEARNING EXPERIENCES

10. Outdoor Learning

Gr.	Outdoor Experience	Subject Standards
K	Map the playground and observe a tree in each season, find living things during nature walks	Social Studies- 5A Reading and Constructing Maps Earth and Space Sciences 1A- Seasons ELA- Non-fiction writing and reading
1	Observe clouds, temperature, rain gauge and organisms on nature walks	Earth & Space Science 1 D. Weather and Climate Life Science 1A- Structure and Function ELA- Reading, making a diagram, NF writing & reading
2	Weldon Springs Field Trip- Observe soil, create feeders for butterflies, experiment with changes in matter	Physical Science 1A- Structure and Properties of Matter Life Science 1B-Growth and Development of Organisms ELA- Non-fiction writing and reading
3	Botanical Gardens Field Trip- Learn which plants help each other grow, observed bees and learn about their role in reproduction of plants	Science- Life Science 1A- Structure and Function, B- Growth and Development of Organisms ELA- Non-fiction writing and writing
4	Weather Station- Gauge the weather with instruments provided	Earth and Space Sciences 2D -Weather and Climate Mathematics- 4GMC- Measurement and Conversion
5	Katy Trail Field Trip- observe organisms in the pond, discuss how human activity affects the environment	Life Sciences 2B-Cycles of Matter and Energy Transfer in Ecosystems

11. Context & Community with Outdoor Learning

Subject Standards: Students created a pollinator garden using seeds of native plants to encourage bee activity. After growing these plants and observing the importance of bees in pollination, they wrote persuasive essays about the importance of bees vs. using pesticides. They presented persuasively at our all school assembly about this topic.

Community Engagement & Civic Skills: Again, bees have been a focus. Students have educated parents and installed their own pollinator gardens, many using native plants, near their home vegetable plots. Students created “Bees Please!” signs/displays for community visitors to the school garden. We collect, create seed packets and sell/donate them to the community.

COMMUNITY ENGAGEMENT

12. Community Engagement

Students have helped create and maintain a community garden, from which they have harvested seeds. Through their Sowing Seeds project, students harvest, package, illustrate with their own artwork and research/write planting instructions for each seed packet. These packets are given to older adults through our “Grandfriends” partnership and also sold to community partners to ensure pollinator gardens throughout our community.

Students at Green Trails worked with 10,000 Pencils, an upcycling school supply project. In the past, many school supplies were disposed of at the end of the school year, student leaders educated the other students about the amount of crayons, paper and other items that were being thrown in landfills that others could benefit from. These student leaders facilitated a school supply drive where hundreds of pounds of used items were donated to students in an urban St. Louis school district and a Zambian school. Students helped sort and remove paper wrappings from crayons to be melted down to create new crayons.

13. Partnerships in the Pillars

Pillar 1, Sustainability: We were able to secure 50 native pollinator starter plants from Greenscape Gardens, a local nursery, for our new pollinator garden planted by Environmental Leaders.

Pillar 2, Health: The Green Trails United Methodist Church, our community partner, helps promote Walk to School days and provides a place to gather and healthy refreshments. During each event, we have between 50 and 150 walkers including parents, grandparents and pets.

Pillar 3, Learning: Students taught “Grandfriends” in a local retirement community exercises and prepared exercise instruction cards so their Grandfriends can continue to improve health and vitality. Students also shared their harvested seeds and gardening knowledge with Grandfriends and others in the community. Fruit/vegetable/pollinator gardens now exist all over where they didn’t before.

OVERALL EDUCATION IMPACT

14. Education Summary

Our students have a more rounded education in a school with an established community garden and a focus on being outside. It is difficult to isolate our top accomplishments, because sustainable education is about the many small gestures that connect to make a big impact.

We have many teachers with no experience gardening, now planting and growing with students, helping students compost, enjoying nature while read/write in our outdoor classroom and most importantly, solidifying their enjoyment and skills around sustainability. They are who advocated for doubling daily recess minutes with extraordinary results.

Our connection with nature has many more students advocating for causes such as wildlife near extinction and upcycling. Students present at all school weekly assemblies about specific endangered animals such as seals/whales, and how kids can impact their protection through educating others, penny drives, and voicing their opinions in meaningful ways. Students are also advocating through clubs and groups to initiate projects such as Terracycling to ensure packages that would end up in landfills are recycled.

MEDIA

15. Media

1. **Students created pollination seed packets** using seeds harvested from the garden. They research, write instructions and illustrate during art class. The packets are then given to partners in the community such as our “Grandfriends” at the senior center and the church.
2. **Green Trails Gator Run** - We host a community 1 mile and 5K run. Here students are leading the warmups.
3. **Garden-** Over many weekends and school days, our community has come together to build, plant, maintain and harvest in the Green Trails Community Garden. Produce from the garden is harvested and made available in the cafeteria. All students are encouraged to try the produce. For many, it is the first time they have tried radishes, zucchini or sweet potatoes. Bok Choy is now a favorite, where before most kids had never had it.
4. **Club Hope and The GT Garden Club** are groups of students who focus on caring for animals and the garden in environmentally cognizant ways. Here, they are making screech owl houses.