



School Nominee Presentation Form

ELIGIBILITY CERTIFICATIONS

School and District's Certifications

The signatures of the school principal and district superintendent (or equivalents) on the next page certify that each of the statements below concerning the school's eligibility and compliance with the following requirements is true and correct to the best of their knowledge. *In no case is a private school required to make any certification with regard to the public school district in which it is located.*

1. The school has some configuration that includes grades early learning to 12.
2. The school has been evaluated and selected from among schools within the Nominating Authority's jurisdiction, based on high achievement in the three ED-GRS Pillars: 1) reduced environmental impact and costs; 2) improved health and wellness; and 3) effective environmental and sustainability education.
3. Neither the nominated public school nor its public school district is refusing the U.S. Department of Education Office of Civil Rights (OCR) access to information necessary to investigate a civil rights complaint or to conduct a district wide compliance review. The Department of Defense Education Activity (DoDEA) is not subject to the jurisdiction of OCR. The nominated DoDEA schools, however, are subject to and in compliance with statutory and regulatory requirements to comply with Federal civil rights laws.
4. OCR has not issued a violation letter of findings to the public school district concluding that the nominated public school or the public school district as a whole has violated one or more of the civil rights statutes. A violation letter of findings will not be considered outstanding if OCR has accepted a corrective action plan to remedy the violation.
5. The U.S. Department of Justice does not have a pending suit alleging that the public school or the public school district as a whole has violated one or more of the civil rights statutes or the Constitution's equal protection clause.
6. There are no findings of violations of the Individuals with Disabilities Education Act in a U.S. Department of Education monitoring report that apply to the public school or public school district in question; or if there are such findings, the state or public school district has corrected, or agreed to correct, the findings.
7. The school meets all applicable federal, state, local and tribal health, environmental and safety requirements in law, regulations and policy and is willing to undergo EPA on-site verification.

U.S. Department of Education Green Ribbon Schools

Public Charter Title I Magnet Private Independent Rural

Name of Principal: Mr. Julius Scott

(Specify: Ms., Miss, Mrs., Dr., Mr., etc.) (As it should appear in the official records)

Official School Name: Dutch Fork Elementary School - Academy of Environmental Sciences
(As it should appear on an award)

Official School Name Mailing Address: 7900 Broad River Rd., Irmo, SC 29063
(If address is P.O. Box, also include street address.)

County: Lexington State School Code Number *:

Telephone: 803-476-3900 Fax: 803-476-3920

Web site/URL: <https://www.lexrich5.org/Domain/10> E-mail: jscott@lexrich5.org

*Private Schools: If the information requested is not applicable, write N/A in the space

I have reviewed the information in this application and certify that to the best of my knowledge all information is accurate.

Date: January 28, 2019

(Principal's Signature)



Name of Superintendent: Dr. Christina S. Melton
(Specify: Ms., Miss, Mrs., Dr., Mr., etc.) (As it should appear in official records)

District Name: School District Five of Lexington and Richland Counties

I have reviewed the information in this application and certify that to the best of my knowledge all information is accurate.

Date: 1/28/19

(Superintendent's Signature)

Nominating Authority's Certifications

The signature by the Nominating Authority on this page certifies that each of the statements below concerning the school's eligibility and compliance with the following requirements is true and correct to the best of the Authority's knowledge.

1. The school has some configuration that includes grades Pre-K-12.
2. The school is one of those overseen by the Nominating Authority which is highest achieving in the three ED-GRS Pillars: 1) reduced environmental impact and costs; 2) improved health and wellness; and 3) effective environmental and sustainability education.
3. The school meets all applicable federal civil rights and federal, state, local and tribal health, environmental and safety requirements in law, regulations and policy and is willing to undergo EPA on-site verification.

Name of Nominating Agency: South Carolina Department of Education

Name of Nominating Authority: Ms. Molly M. Spearman, State Superintendent of Education
(Specify: Ms., Miss, Mrs., Dr., Mr., Other)

I have reviewed the information in this application and certify to the best of my knowledge that the school meets the provisions above.

Date: 7 February 2019

(Nominating Authority's Signature)

SUBMISSION

The nomination package, including the signed certifications, narrative summary, documentation of evaluation in the three Pillars, and photos should be submitted online according to the instructions in the Nominee Submission Procedure.

OMB Control Number: 1860-0509

Expiration Date: March 31, 2021

Public Burden Statement

According to the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless such collection displays a valid OMB control number. The valid OMB control number for this information collection is 1860-0509. Public reporting burden for this collection of information is estimated to average 37 hours per response, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. The obligation to respond to this collection is required to obtain or retain benefit P.L. 107-110, Sec. 501, Innovative Programs and Parental Choice Provisions. Send comments regarding the burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to the U.S. Department of Education, 400 Maryland Ave., SW, Washington, DC 20202-4536 or email ICDocketMgr@ed.gov and reference the OMB Control Number 1860-0509. Note: Please do not return the completed ED-Green Ribbon Schools application to this address.



Dutch Fork Elementary School - Academy of Environmental Sciences

South Carolina Nominee to

U.S. Department of Education Green Ribbon Schools



Prepared by

South Carolina Department of Health and Environmental Control

Green Ribbon School Collaborative

January 2019

Summary of Achievements

Dutch Fork Elementary School – Academy of Environmental Sciences, Irmo, SC

School Background

Dutch Fork Elementary School Academy of Environmental Sciences (DFES) is a whole school environmental sciences-themed magnet school located in the midlands of South Carolina approximately 10 miles northwest of the state capitol, Columbia. As a public magnet school, DFES welcomes a diverse enrollment of students from the surrounding neighborhoods and across School District Five of Lexington and Richland Counties three geographical areas of Chapin, Dutch Fork, and Irmo. In 2018-19, the total student enrollment is 531 where 255 students (48%) are African-American, 181 students (34.1%) are Caucasian, 48 students are Multiracial (9%), 35 students are Hispanic (6.6%), 8 students are Asian (1.5%) and 3 students are Hawaiian/Pacific Islander (0.6%).

DFES consistently ranks among the top school districts in South Carolina for academic achievement and teacher quality. Today, DFES prides itself as being a comprehensive inquiry-based, hands-on program focused on immersing children in discovery and exploration, collaborative study, scientific research, the use of scientific tools and technology, and a strong sense of community. Since its inception, the school has committed itself to maintaining the highest educational standards by using the natural environment and nature-human interactions as the catalyst for student learning outcomes and critical thinking. The school's curriculum aligns with state standards by grade level following a themed continuum entitled "from the mountains to the sea" that explores the South Carolina landscape within a global context. In the process, DFES has endeavored to develop into South Carolina's premier environmental elementary school.

Pillar 1 – Reducing Environmental Impacts and Costs

DFES has switched incandescent and CFL bulbs to LED. In addition to more conscious use of energy at the school, moderate changes to lighting components have led the school to reduce energy consumption by approximately 11 percent in the last two years. DFES' school district has entered into partnership with Cenergistic, a conservation education and technology company, to better understand how it can capture savings across all schools, including: ensuring units are running properly, verifying parking lighting schedules, and monitoring of water usage. This partnership will help inform the school and the South Carolina Energy Office when creating a student-driven energy audit and be used to identify additional areas where the school can make energy-focused changes. As part of this effort, DFES has moved to a Managed Print System that has cut down on energy use and costs.

The school has improved water conservation and efficiency through the use of rain barrels that collect water for the school's gardens. Also, students crafted rain chains made out of recycled materials. In addition, the school disconnected hot water in school bathrooms in order to save

on energy costs. More broadly, water conservation has been a central theme for the school. This is evidenced by rationing experiments that show students how they can use less water, save on costs, and teach others to do the same.

The school initiated a food waste and compost program to divert waste from landfills. In doing so, students collect data to show how much waste has been diverted in a given month. Current projections put food waste diversion at 5,000 lbs. per month, and a decrease in hauling fees of approximately \$1,700 per year. Regular trainings are given to teachers and students, and the students are given the opportunity to be leaders.

The DFES community instituted a school-wide recycling program with office and classroom paper products, plastic containers and jugs, aluminum cans, and cardboard managed by student Recycling Captains. In that vein, the school has a robust litter prevention campaign around the car rider line. In this project, students categorized and graphed the different types of trash and shared the results to the school community. Additionally, DFES works with non-zoned students to provide carpooling opportunities. This reduces transportation costs, cars on the road, and vehicle emissions.

Pillar 2 - Improving the Health and Wellness of Students and Staff

DFES participates in South Carolina Department of Health and Environmental Control (SCDHEC)'s Breathe Better (B²) program, giving students the opportunity to audit vehicles for the purpose of instituting anti-idling policies. Also, School District Five of Lexington and Richland Counties contracts with Titan Termite and Pest Control for integrated pest management. School gardens and composting sites are controlled naturally through design and proximity to buildings to manage pests. Most chemicals used for cleaning are processed through EcoLab and thus comprised of 99% water. All sites have contaminant controls in place, with chemicals under lock and key. Facilities staff perform an annual walk-through and check under every sink at all sites for chemicals, and remove/dispose of any unnecessary chemicals. The school has drop ceilings to improve acoustics. The cafeteria and gym have wall foam that helps reduce sound and improve acoustics on campus. Dehumidifiers are used when moisture is high due to the indoor mold potential in the region.

DFES has established a well-rounded approach to nutrition and fitness at the school. The interpretive nature trail behind the school was completed in the Spring 2015 in partnership with SC Forestry Commission, AmeriCorps, Emory University, and Back to Eden. DFES also participates in the Girls on the Run program. Similarly, the school has grown in its Five Areas of Fitness and FitnessGram programs, and maintains a fitness club in the morning for fourth and fifth graders, and "Jump Rope for Heart" supported by The Heart Foundation.

Health and wellness are also tied to the school's participation in its Farm to Five (i.e. District Five) adaptation of Farm to School. DFES offers Healthy Hands Cooking classes, giving students an opportunity to be exposed to methods to cooking fresh meals from the garden produce that

they have grown, and to teach family and peers. Cafeteria staff has received training by chefs in scratch-cooking methods thanks to USDA Farm to School and Boeing grants.

Pillar 3 - Provide Effective Environmental and Sustainability Education that Incorporates STEM, Civic Skills, and Green Career Pathways

DFES has committed itself to provide effective environmental and sustainability education that incorporates STEM, civic skills, and green career pathways for its students. Third grade classes collect plastic bags, write down the amount each bag weighs, calculate the total number of pounds of plastic collected each month, and do accompanying readings. Pre-K and third grade classes are trained by Richland County Soil and Water on how to start and maintain active worm bins. The students collect food scraps from the cafeteria to add to the worm bin, measure the mass of the food scraps, journal their observations, and then add the compost to the garden areas.

Teachers attend training each fall with Trout Unlimited in order to oversee Trout in the Classroom program(s). Students completed a year-long inquiry into the Barred Owl and how to increase its population in South Carolina because of concerns over impacts to its habitat. DFES has committed itself to environmental and sustainability themes to develop STEM content knowledge and critical thinking skills. One of these approaches includes the use of plants in the classroom. Second and third grade students research types of plants that are good for air quality and are also cost effective. Also, DFES started a pollinator garden, monarch highway, and bee hive designed to deepen curriculum for each grade. Other notable projects include the hands-on solar ovens and solar huts to protect their plants from the cold.

DFES has exposed elementary students to civic skills and green career pathways with upcycling projects and a silent auction. Second graders collected used plastic bags and learned to make “plarn” for use as bedrolls for the homeless in SC communities. They also set up collection stations around the school for old markers, which Crayola converts to clean fuel for vehicles and homes. DFES grows a variety of plants, including kale and cabbage, on campus to teach students about farming techniques and to participate in a local farmers market and a compost and heirloom seed fundraiser.

Documentation of State Evaluation of School Nominee

***NOTE:** Some Green Ribbon elements below will include an alpha-numeric code. These codes signify the state education standards that correspond with an action (e.g. 1.E.4B.2, 3.E.4B.3, or 5.E.3B.4). For more information please visit ed.sc.gov/instruction/standards-learning/science/support-documents-and-resources for standards, conceptual understanding, and performance indicators.*

Pillar 1: Reduce Environmental Impact and Costs

Element 1A: Energy Savings

- **Lighting**

Incandescent and CFL lamps (not lighting fixtures) have been switched to LED. The lighting fixtures will be upgraded to LED when HVAC systems are replaced at the school. However, in addition to more conscious use of energy, moderate changes to lighting components have led DFES to reduce energy consumption by approximately 11% in the last two years. This is due in large part to systems scheduling (lighting, irrigation, HVAC, etc).

- **Student-driven energy audits**

DFES was built in 1953 and is one of the district's oldest facilities. This requires additional attention due to it being a less energy efficient structure. However, this compels the school to be more cognizant of energy savings. DFES' school district has partnered with Cenergistic to better understand how they can capture utility savings across all schools, including: ensuring units are running properly, verifying parking lighting schedules, and monitoring of water usage. This partnership will help inform DFES and the South Carolina Energy Office when creating a student-driven energy audit, including the use of an infrared thermographer, a "kill-a-watt" meter, and a light meter. The information students collect is being used to identify additional areas where the school can make energy-focused conservation measures in an historic building.

- **Printer and Paper Usage**

As part of a district-wide effort, DFES moved to a Managed Print System and online records management in finance/operations/human resources systems. Only community printers are available at the school, and this has saved on energy, waste and cost.

Element 1B: Improved Water Quality, Efficiency, and Conservation

- **Rain Barrels**

Pre-K, first, second and third grades take care of garden spaces at the school. They use water from rain barrels to water flowers in the raised beds, earthtainers, and in the greenhouse. This capture technology helps DFES to reduce soil runoff and long-term water costs. In this project, students continue to help train parents about the use of rain barrels, how best to use water-capture technology at home, and why rain barrels may be an important feature in 1) cost savings, 2) resource management, and 3) soil management.

State standards: (2.E.2A.1, 4.E.2B.1) & (S.1A.1, S.1A.4, S.1A.5, S.1A.6, S.1A.7, S.1B.1)

- **Rain Chains**

Fourth grade students identify areas around the school that are best for rain chains (e.g. where the noise of falling water can be reduced). They made observations of how noisy the water ran

off the roof prior to installation. Students designed the rain chains and collect materials for construction. This project allows students to continue thinking in the direction of sustainable construction, art, and expression. Having students build the rain chains with recycled materials defrays the cost of having to purchase the items. Students shared their findings during a fourth grade learning celebration.

State standards: (1.E.4B.2, 3.E.4A.3, 3.E.4B.3, 3.E.4B.4, 5.E.3B.3, 5.E.3B.4) & (S.1A.1, S.1A.4, S.1A.5, S.1A.6, S.1A.7, S.1B.1)

- **Water Rationing**

Fifth graders were inspired to conduct their own water rationing experiment after learning about the water shortage in Cape Town, South Africa. They inquired into water shortages in America and what people are doing to conserve water. This water ration experiment showed how much water they consume in a day and how to do their part. This project was highlighted in their class learning celebration that included fifth grade parents, the DFES community, and third, fourth and fifth graders.

- **Native Plants**

The campus has a modest irrigation system on campus that is on a limited schedule, so specific attention has been drawn to native plantings that require less water. DFES is committed to continuing this tradition, and finding new areas that will require little to no additional water.

State standards: (2.E.2A.1, 4.E.2B.1) & (S.1A.1, S.1A.4, S.1A.5, S.1A.6, S.1A.7, S.1B.1)

Element 1C: Reduced Waste Production

- **School Food Waste to Compost Program**

The entire DFES community composts all breakfast, lunch, and snack food waste. All milk cartons, paper towels, napkins, any food waste, paper containers and trays are separated from recycling and landfill items. Food waste is placed in a SMART cart for compost hauling, and its mass measured and included in Waste Stream Data compiled each month. The school also set up a centrally located “Share Table” where students can leave “unopened” food items to be shared with other students who may be hungry. The school uses metal utensils when possible and reusable “Tap and Stack” trays. Similarly, cafeteria waste stream and classroom composting lessons are given to new teachers, classes with new students, and by teacher request. These lessons include students sorting and classifying items that can be composted. In this case, “landfill bucket helpers” complete a training at the beginning of the school year, and students can lead their classrooms in the composting efforts in their own classrooms and the cafeteria. After aggressive campaigning, the school is averaging waste diversion at 5,000 lbs. per month and a decrease in hauling fees of approximately \$1,700 per year.

State standards: (1.E.4B.2, 3.E.4A.3, 3.E.4B.3, 3.E.4B.4, 5.E.3B.3, 5.E.3B.4) & (S.1A.1, S.1A.4, S.1A.5, S.1A.6, S.1A.7, S.1B.1)

- **School-wide Recycling**

The entire DFES community recycles all office and classroom paper products, plastic containers and jugs, aluminum cans, and cardboard. This is in concert with the district-wide waste and recycling program contracted with Capital Waste (Columbia, SC). At the beginning of the year, several teachers performed recycling captain trainings with first through fifth grade students. On Wednesdays and after all lunches, recycling captains collect bins from classrooms and other areas of the school and take them to the collection site. Recyclables students collect are measured and included in Waste Stream Data displayed in the cafeteria. In November, third through fifth grade “recycling captains” were able to participate in a Palmetto Pride-sponsored field trip to Sonoco Recycling to get further training. From there, recycling captains had the ability to lead their classrooms in the recycling efforts in their own classrooms.

State standards: (1.E.4B.2, 3.E.4A.3, 3.E.4B.3, 3.E.4B.4, 5.E.3B.3, 5.E.3B.4) & (S.1A.1, S.1A.4, S.1A.5, S.1A.6, S.1A.7, S.1B.1)

- **Shoe Recycling Challenge**

Students set up collection stations at school for old shoes and created a hallway data chart to track the number of shoes collected. In 2018, students set a goal of 300 shoes by the end of April. Students promoted this project during their second grade learning celebration in October.

State standards: (1.E.4B.2, 3.E.4A.3, 3.E.4B.3, 3.E.4B.4, 5.E.3B.3, 5.E.3B.4) & (S.1A.1, S.1A.4, S.1A.5, S.1A.6, S.1A.7, S.1B.1)

- **Litter Prevention**

The car rider line was where DFES was picking up the most litter around the school. Students counted the amount of trash and graphed the data on a chart. The purpose of this project was to bring some awareness of litter at the school, and to inform the community as to how the school might eliminate the trash.

State standards: (1.E.4B.2, 3.E.4A.3, 3.E.4B.3, 3.E.4B.4, 5.E.3B.3, 5.E.3B.4) & (S.1A.1, S.1A.4, S.1A.5, S.1A.6, S.1A.7, S.1B.1)

Element 1D: Use of Alternative Transportation

- **Carpool Survey(s)**

DFES conducted a carpool survey to support student recruitment and retention of non-zoned students. In this case, bus transportation is not provided by the district for non-zoned students to attend the school, so carpooling has the potential to improve alternative transportation

options for families. However, the district's transportation department makes regular work monitoring routes and making bus-rider services more efficient and cost-effective.

Pillar II: Improve the Health and Wellness of Students and Staff

Element 2A: Environmental Health

- **Breathe Better (B²) - Anti-Idling Program**

One of the fourth grade classes measured the cars idling in the car rider line, giving students an opportunity to better understand the amount of emissions that are present around the school. This program reduces idling around schools and encourages students to take a proactive approach to improve air quality beyond the EPA mandate. Data collected from these vehicle counts are sent in to SCDHEC's B² program. Students continue collecting data throughout the school year, and share the outcomes at a learning celebration.

State standards: (2.E.2A.1,4.E.2B.1) & (S.1A.1, S.1A.4, S.1A.5, S.1A.6, S.1A.7, S.1B.1)

- **Pest Management**

DFES's school district contracts with Titan Termite and Pest Control for pest management. They use an integrated system with controls through environmental sources such as landscaping design and eliminating/reducing food sources. Education is provided to staff during the pest management process. This system has resulted in reduced chemical usage and increased physical assets, such as door sweeps to prevent bugs/pests from entering. School gardens and composting sites are controlled naturally (through design and proximity to buildings) to manage pests.

- **Cleaning Supplies**

Most chemicals used for cleaning are processed through EcoLab (comprised of 99% water). All sites have contaminant controls in place, with chemicals under lock and key. At a minimum, the facilities staff does an annual walk-through, checks under every sink for chemicals, and removes/disposes of any brought in by staff. Also, all General Contractors are required to properly recover Freon and oil.

- **Acoustics**

School District Five of Lexington and Richland Counties has instituted that all sites' drop ceilings have certain levels of acoustics/panels. Due to this, the cafeteria and gym at DFES have wall foam that helps reduce sound and improve acoustics on campus.

- **Dehumidification**

Dehumidifiers are used when moisture is high due to the indoor mold potential in the region. More broadly, there are efforts underway to reduce carpet and replace it with hard surface tile to improve air quality. This is taking place at DFES and throughout the district.

Element 2B: Nutrition and Fitness

- **Nutrition**

DFES participates in Healthy Hands classes that expose students to several health-related approaches to cooking. Students receive nutrition lessons, and the cooking skills to prepare healthy dishes. First graders teach cooking lessons to kindergarten students by using ingredients they have grown. In that vein, the school offers a salad bar in the cafeteria. USDA Farm to School and Boeing grants have allowed staff to receive training by chefs in scratch-cooking methods using locally grown, fresh produce. With grant funding and assistance from partners, local food offerings have expanded. Also of note, District Five is a leader in the Farm to School movement in South Carolina and a pioneer in educational innovation. This Project represents the next step in the district's strategic investment in educational innovation and farm to school practices that align with the state's economic and environmental goals. Underpinning the project is the Center for Advanced Technical Studies (CATS) cropstop that allows DFES students to process and freeze school-based production of vegetables for use throughout the year.

- **Fitness**

Physical fitness is becoming a central component at DFES. As of 2015, the interpretive nature trail behind DFES was completed in partnership with SC Forestry Commission, AmeriCorps, Emory University, and Back to Eden. The school has been adding additional features from year-to-year, including: steps, outdoor tables, and signage. The school's resident scientist continues to provide nature training walks with teachers upon request. This trail serves as one of the primary sites for outdoor education and physical activity at the school. Additionally, DFES participates in the Girls on the Run program, an after-school club dedicated to inspiring young, dedicated women to be healthy through fitness and sport. Similarly, the school has grown in its "Five Areas of Fitness" and FitnessGram programs, which involves cardiovascular health, muscular and endurance strength, and body mass index. DFES is also a proud supporter of a fitness club in the morning for fourth and fifth graders, and "Jump Rope for Heart" supported by The Heart Foundation.

Pillar III: Provide Effective Environmental and Sustainability Education,
Incorporating STEM, Civic Skills, and Green Career Pathways

Element 3A: Interdisciplinary Learning about Key Relationships between Dynamic Environmental, Energy, and Human Systems

- **Trex Contest**

Every two weeks, several third grade teachers have their classes weigh the amount of plastic bags collected by placing individual bags into groups of larger bags. Students write down the amount each bag weighed and then calculate the total number of pounds for that month. Students add up each month's total to get the overall total. Students read about how plastic affects the environment and why plastic bags need to be recycled. This project is emphasized during third grade learning celebrations.

State standards: (1.E.4B.2, 3.E.4A.3, 3.E.4B.3, 3.E.4B.4, 5.E.3B.3, 5.E.3B.4) & (S.1A.1, S.1A.4, S.1A.5, S.1A.6, S.1A.7, S.1B.1)

- **Classroom and Garden Composting**

Richland County Soil and Water came in to help with soil lessons and set up vermicomposting bins. A Pre-K and third Grade class have active worm bins in their rooms. Each week they collect food scraps from the cafeteria to add to the worm bin. Students measure temperature and the mass of food scraps, and record observations in their journals. Once a sufficient amount of compost is generated it is then added to the garden areas. Additionally, the school has an outdoor compost bin in the "Kenny's Garden" area that students maintain. Students shared their expert project(s) at school gatherings.

State standards: (1.E.4B.2, 3.E.4A.3, 3.E.4B.3, 3.E.4B.4, 5.E.3B.3, 5.E.3B.4) & (S.1A.1, S.1A.4, S.1A.5, S.1A.6, S.1A.7, S.1B.1)

- **Trout in the Classroom**

Kindergarten classes participate in the Trout in the Classroom project(s). The lead teachers attend a training along with another teacher on their team each fall. They receive eggs in late November from Trout Unlimited. Teachers set up tanks while students maintain the habitat by measuring temperature, pH, and ammonia levels. They also learn how the indoor habitat simulates their natural habitat. They learn about their behavior, anatomy, species, and more. The students release their trout into the Saluda River in March at Saluda Shoals Park. Kindergarten students share about their experiences in their learning celebrations.

State standards: (1.E.4B.2, 3.E.4A.3, 3.E.4B.3, 3.E.4B.4, 5.E.3B.3, 5.E.3B.4) & (S.1A.1, S.1A.4, S.1A.5, S.1A.6, S.1A.7, S.1B.1)

- **Owl Habitat**

Students completed a year-long inquiry into SC owl species with a focus specifically to understand how to increase the Barred Owl numbers in the state. The students raised funds to make a Barred Owl house to mount at DFES. They completed expert projects and shared those at the Magnet Showcase. Third Grade students shared about their experiences in their learning celebration with the DFES community that included parents and third through fifth grade students. They also shared about their project with sister school, John Stanford International Elementary, in WA.

State standards: (3.E.4A.3, 3.E.4B.3, 3.E.4B.4) & (S.1A.1, S.1A.4, S.1A.5, S.1A.6, S.1A.7, S.1B.1)

Element 3B: Use of the Environment and Sustainability to Develop STEM Content Knowledge and Critical Thinking Skills

- **Plants in the Classroom**

Second and third grade (ED/LD) students researched types of plants that are good for air quality and costs. Students had a fundraiser in December to pay for enough plants for each classroom in the school. These students distribute the plants and monitor growth and care. Lessons learned are imparted to other students upon delivery of the plants.

State standards: (1.E.4B.2, 3.E.4A.3, 3.E.4B.3, 3.E.4B.4, 5.E.3B.3, 5.E.3B.4) & (S.1A.1, S.1A.4, S.1A.5, S.1A.6, S.1A.7, S.1B.1)

- **Pollinator Garden & Monarch Highway & Bee Hive**

DFES has an indoor beehive in the media center. The media specialist (along with the district technology teacher/bee keeper) designs lessons to do with each grade level that focus on the importance of pollinators and what conditions are needed to provide them with the best habitat for survival. Project Wild curriculum activities such as “First Impressions” and “Here Today and Gone Tomorrow” are experiences that help to begin these projects. Students create “expert” projects on pollinators across grade levels, and habitat in the earthtainer, raised bed gardens, and little farm. DFES procured milkweed plants and seeds and planted them in the greenhouse and pollinator garden. Students shared their expert projects at the Magnet Showcase, school gatherings, the fifth grade science fair, and Envirofest.

State standards: (K.L.2A.1, 2.L.5B.1, 3.L.5B.1, 4.L.5B.3 C, 5.L.4B.4) & (S.1A.1, S.1A.4, S.1A.5, S.1A.6, S.1A.7, S.1B.1)

- **Solar Ovens**

Fifth grade students designed a project on oven designs and their effect on cooking times. This project is meant to have students think about renewable energy as a way of defraying the cost of using other forms of energy, conceptual design and efficiency through trial and error, and to further their understanding of how best to connect to other world issues through their

inventions (i.e. where, geographically, their designs might be appropriate). Students shared the outcomes of their experiments at the Environmental Science Fair.

State standards: (4.E.3B.3, 4.P.4A.2, 4.P.4A.4) & (S.1A.1, S.1A.4, S.1A.5, S.1A.6, S.1A.7, S.1B.1)

- **Solar Huts**

Students built removable structures to protect raised bed plants from frost and cold temps. They collected bottles to help build the structure. This project is meant to have students think about recycling while learning about the effects of seasonality on crops, and which structures may be appropriate given South Carolina's geography. Also, the solar huts function as a learning tool where students can gain hands-on experience with green construction. Students share their projects during learning celebrations.

State standards: (4.E.3B.3, 4.P.4A.2, 4.P.4A.4) & (S.1A.1, S.1A.4, S.1A.5, S.1A.6, S.1A.7, S.1B.1)

Element 3C: Civic Skills and Green Career Pathways

- **Upcycled Projects and Silent Auction**

In this project, fourth graders learned about "upcycling" by designing and creating various items. They estimate its value by doing some research, then set up a silent auction. The auction took place the day of the last Tag of Honor Ceremonies and annual Talent Show. Students shared their projects with the entire DFES community during their auction.

State standards: (1.E.4B.2, 3.E.4A.3, 3.E.4B.3, 3.E.4B.4, 5.E.3B.3, 5.E.3B.4) & (S.1A.1, S.1A.4, S.1A.5, S.1A.6, S.1A.7, S.1B.1)

- **Operation Bed Roll**

Second graders collected used plastic bags and learned to make "plarn" in the effort to provide bedrolls for the homeless in communities around South Carolina. Collecting, creating, and measuring are an essential part of the student work in this project. Students taught their parents at Envirofest this year.

State standards: (1.E.4B.2, 3.E.4A.3, 3.E.4B.3, 3.E.4B.4, 5.E.3B.3, 5.E.3B.4) & (S.1A.1, S.1A.4, S.1A.5, S.1A.6, S.1A.7, S.1B.1)

- **Crayola ColorCycle Program**

Students set up stations around the school to collect old markers. Each month, the markers collected were measured for mass, and then returned to Crayola. Crayola then turned these markers into clean fuel for vehicles and homes. This project was emphasized in a first grade learning celebration at the beginning of the school year.

State standards: (1.E.4B.2, 3.E.4A.3, 3.E.4B.3, 3.E.4B.4, 5.E.3B.3, 5.E.3B.4) & (S.1A.1, S.1A.4, S.1A.5, S.1A.6, S.1A.7, S.1B.1)

- **Farmers Market/Compost & Heirloom Seed Fundraiser**

DFES grows a variety of plants on campus. Typical produce includes kale and cabbage grown by first graders. The school also generates compost and heirloom seeds that are sold at Envirofest and Soda City during the annual Earth Day Event. Heirloom seeds are sold at Envirofest by the first grade students. Both first and fifth graders that partake in the events share their experiences and knowledge with event participants.

State standards: (1.E.4B.2, 3.E.4A.3, 3.E.4B.3, 3.E.4B.4, 5.E.3B.3, 5.E.3B.4) & (S.1A.1, S.1A.4, S.1A.5, S.1A.6, S.1A.7, S.1B.1)

- **Air Plants in Hallways**

One of the fifth grade science fair groups measured the CO₂ levels in the cafeteria hallways. They researched plants that would help to improve air quality and where those plants should be placed. Students shared their findings with DFES community members at the annual Environmental Science Fair.

State standards: (2.E.2A.1, 4.E.2B.1) & (S.1A.1, S.1A.4, S.1A.5, S.1A.6, S.1A.7, S.1B.1)

Partnership Recognition

Tireless efforts on several fronts have helped DFES become one of the environmental leaders and state education standard-bearers in South Carolina. The school's successes are attributed to strong support from the PTA, teachers and principal, the school's resident scientist, volunteers and mentors, and the community. Similarly, the school is a proud member of the School District Five of Lexington and Richland Counties under which the school has been able to thrive.

Other partners in this effort and/or elements of work performed include (but are not limited to) the following:

- South Carolina Department of Education - <https://ed.sc.gov/>
- South Carolina Green Steps Schools - <http://greenstepschools.com/>
- SC Forestry Commission - <https://www.state.sc.us/forest/>
- South Carolina Energy Office - <http://www.energy.sc.gov/>
- Environmental Educators Association of South Carolina (EEASC) - <http://eeasc.org/>
- Richland County Storm Water Management / Conservation Commission - <http://www.richlandcountysc.gov/Government/Departments/Public-Works/Stormwater-Management/>
<http://www.richlandcountysc.gov/Government/Commissions/Conservation-Commission>
- Richland Soil Conservation District - <https://richlandswcd.net/>
- Students Engaged in Aquatic Science (SEAS) - <https://www.seoe.sc.edu/seas/home>
- Palmetto Pride - <https://www.palmettopride.org/>

- SMART Recycling - <http://www.smartrecyclingus.com/>
- RESOIL - <http://www.resoil.us/#recsoilmain>
- Healthy Hands Cooking - <https://www.healthyhandscooking.com/>
- Farm to School / Farm to Five - <https://www.lexrich5.org/Page/9219>
- Harbison State Forest - <https://www.state.sc.us/forest/refharb.htm>
- Saluda Shoals Park - <https://www.icrc.net/parks/saluda-shoals-park>
- South Carolina Wildlife Federation - <http://www.scwf.org/our-staff/>
- Congaree National Park - <https://www.nps.gov/cong/index.htm>
- South Carolina Department of Health and Environmental Control (SCDHEC) - Green Ribbon School Collaborative - <https://www.scdhec.gov/>

ACCOLADES

- Magnet Schools Assistance Program (MSAP) grant awarded by the United States Department of Education, 2013. Grant to support Project ACCESS which enabled Dutch Fork Elementary to launch as a whole-school environmental sciences-themed magnet.
- Farm to School grant awarded by the United States Department of Agriculture, 2013. Grant to support Farm to Five which provided technical assistance and supplies to promote local food procurement, scratch cooking methods, and supplies for school gardens and greenhouse.
- SCDHEC Champions of the Environment, 2014-2015. Observation Bee Hive.
- Farm to School grant awarded by the South Carolina Department of Agriculture, 2016. Grant to support transportation for student field studies to area farms, materials for garden areas and cooking supplies.
- Richland County Conservation Commission & D5 Foundation - Transportation Costs for Environmental Field Studies for 2015-2016 school year, and again for this 2017-2018 school year.
- Richland County Soil Conservation District & EEASC - Environmental Science Fair Materials and Awards.
- Richland County Recycling 2016-2017-Scales, SMART TEAM visits, materials for composting.
- SCDHEC - Field Studies for 2016-2017 & 2017-2018 school year.
- Palmetto Pride 2017-2018 - Compost Hauling Services from SMART, and transportation costs for field studies.
- Certified Green Steps School, 2018.