



North Carolina Department of Public Instruction
2016 Green Ribbon Schools Application

School Contact Information

School Name: **Sandy Grove Middle School**

District Name: **Hoke County Schools**

School Address: **300 Chason Road**

City: **Lumber Bridge** State: **NC** Zip: **28357**

Website: [Sandy Grove Middle School Website](#)

Facebook Page: [Sandy Grove Middle School Facebook Page](#)

Principal Name: **Tommy Jacobs**

Principal Email Address: [Tommy Jacobs Email](#)

Phone Number: 910-875-3559

Lead Applicant Name (if different): **Jodie Bryant**

Lead Applicant Email: [Jodie Bryant Email](#)

Phone Number: 910-875-4106

School Information

Level:

- Early Learning Center
- Elementary (PK-5 or 6)
- K - 8
- Middle (6 -8 or 9)**
- High (9 or 10 – 12)

School Type:

- Public
- Private or Independent
- Charter
- Magnet

How would you describe your school's location? Urban Suburban **Rural**

Does your school serve 40% or more students from disadvantaged households? **Yes** No

% Receiving FRPL: **58.11%**

% Limited English Proficient: **2.4%**

Other Measures: **64.5% minority students**

Is your school in one of the largest 50 districts in the nation? Yes **No**

Total Enrollment:

506

Graduation Rate:

n/a

Attendance Rate:

95.62%

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Summary Narrative:

Reduced Environmental Impact and Costs: *Sandy Grove Middle School generates more energy than they consume. This building is tracking to receive LEED Platinum certification and will save Hoke County approximately \$37 million over the next 40 years. The 76,000 sf facility combines energy conserving practices with on-site renewable energy generation to produce 40% more energy than the school requires, annually. Serving a lower income population in rural North Carolina, Sandy Grove Middle School provides a progressive, top caliber STEM learning environment. Located next to an existing elementary school, the area surrounding the school campus supports the future growth in the county.*

Notable innovative design and construction features include photovoltaic and geothermal heating and cooling systems, LED lighting, continuous air barrier, a whole building control of all building systems through the Building Automation System. The sustainable features control indoor environmental quality limiting the toxins and pollutants in the air, provide additional controllability for the conditioning of the space for added thermal comfort, and provide views from 90% of the building's spaces. The tight construction and whole building air barrier limit air and water infiltration in the building, in turn preventing mold growth and removing water from the building envelope.

The geothermal ground-sourced heat pumps use the naturally renewable ground temperature as a heat source in the winter and a heat sink in the summer. This subsurface conductive heat transfer returns near constant 55 degree water to the heat pumps, requiring less energy to raise or lower the indoor air temperature. A photovoltaic solar array of 2,358 roof-mounted panels blankets the entire roof, as well as four striking solar structures that stand 20 feet tall. Combined, the panels produce over 752,000 kilowatt/hours of electricity per year – enough energy to power more than 68 homes. The school alone only used 541,000 kilowatt/hours of electricity last year. This additional 40% energy produced is sold back to the local electric utility company to help further offset building operational costs. Other important factors in conserving energy are super insulated wall and roof assemblies coupled with high-performance glazing and extensive use of LED lighting. The LED lighting not only uses less energy than more traditional fluorescent lighting, it emits less heat which in turn requires less mechanical cooling.

Baseline energy model used was ASHRAE 90.1 – 2007 (for LEED Schools 2009) with a goal of 30% more efficient than baseline building. End result was close to 48% total energy savings.

Indoor Air Quality: The facility provides students with a clean, healthy learning environment through controlled indoor air quality, which limits toxins and pollutants in the air. ASHRAE 62 Ventilation Rate Procedure was used to specify outside air requirements. Dedicated outside air units provide conditioned outside air directly to classroom spaces. This allowed the design team to take advantage of energy savings, allowed direct control for occupancy levels, and ensured full ventilation requirement is delivered to the space when needed. High occupancy spaces such as the gymnasium and cafeteria utilize CO2 sensors in the space to control ventilation rates and turn down based on occupancy.

Environmental Impact: 50 percent of the wood used is certified as coming from responsible sources; 75 percent of construction waste was diverted from disposal; 20 percent of construction materials contained recycled content; and 30 percent was produced in the region. Reduction of CO2 – Median Property 690.4 (metric tons of CO2) and Sandy Grove 193.3 metric tons – a reduction of 497.1 metric tons.

Improve the Health and Wellness: *In an effort to promote healthy lifestyles among our students, Sandy Grove Middle has employed a Coordinated School Health team consisting of a school nurse, school social worker, school counselor, health and PE teachers, cafeteria manager, and school administrators.*



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This team works collaboratively to encourage students' physical education, positive behavior, and healthy eating habits.

Nutrition, Fitness and Healthy Living Goals are integrated in the school's curriculum. The school participates in the Farm to School Program. 50% of food purchases are considered "environmentally preferable" vegetables. The school promotes healthy eating education as part of their overall healthy living goals.

The school prohibits the use of tobacco on school property and to provide healthy learning about its dangers. An ongoing in-school fitness program gives various opportunities to students in improving their health through multi-level participation in fitness and sports activities.

The Hoke County Health Department provides various health presentations in areas of nutrition and diabetes education. The Hoke Cooperative Extension Program – 4H Specialist provides training in social skills. The school district's Student Support Services Department provides anti-bullying education, social skills instructions for individuals and groups. The team uses health and physical education to conduct classes on mental and emotional health, covering topics such as bullying (bystander, victim and perpetrators), cyber bullying, digital citizenship, key indicators for depression and suicide prevention (where and who to contact for help), developing self-esteem, and self-concept awareness.

The team also consults with school psychologist regarding various mental health issues. The school has a Student Assistance Team Program that addresses student behavior and academic issues. Being in close proximity to Fort Bragg, NC the school has a Military Family Support Counselor who provides services to our military-connected students.

Environmental and Sustainable Education: *The sustainable school facility is used as a state of the art technology teaching lab to emphasize the importance of Science, Technology, Engineering, and Mathematics (STEM) in preparing students for life in the 21st century. The staff has embedded the school's resources into the curriculum to provide hands-on activities and research-based projects for students to apply in real-world scenarios. The students have the ability to learn about solar energy, energy and water conservation, air quality, geothermal and recycling.*

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Teachers at Sandy Grove Middle conduct a lesson titled "Basic Sustainable Energy – Solar Energy and Geothermal Heating and Cooling." The content of the unit project is comprised of higher level vocabulary words based from reading and research, and from technical terms used in the process of building and designing of solar cars and mini-solar powered systems. Collaboration with other students will develop their speaking, listening, and writing skills as they design, build, test their solar cars, gather data, and as they share their work to their peers in a technology-oriented environment.

Students and teachers can monitor energy use and production using an interactive energy dashboard. Teachers at the school have written over 20 hours of energy dashboard-based instruction for all grade levels. <http://buildingdashboard.com/clients/hcs/sandygrove/>



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1. Is your school participating in a local, state or national school program, such as EPA ENERGY STAR Portfolio Manager, EcoSchools, Project Learning Tree, or others, which asks you to benchmark progress in some fashion in any or all of the Pillars? **Yes** *No*

2. Has your school, staff or student body received any awards for facilities, health or environment?

Yes *No*

<i>Year</i>	<i>Award Received</i>
2015	<i>ASHRAE Region IV Technology Award First Place for New Educational Facilities</i>
2014	<i>AIA Eastern North Carolina – Honor Award (Service Category)</i>
2014	<i>Adams Masonry Expo – Best Educational Project</i>
2014	<i>Construction Professionals Network of NC – Star Award</i>
2014	<i>NAIOP, Piedmont Triad Chapter – Green Project of the Year</i>
2013	<i>ABC Eagle Award – Best K-12 Education Project</i>
2013	<i>ENR National – Best Project for K12</i>
2013	<i>ENR Southeast – Best Project for K12</i>
2013	<i>NCSBA – Award for Excellence in Architectural Design</i>

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Pillar I: Reduced Environmental Impact and Costs

Energy

1. Can your school demonstrate a reduction in Greenhouse Gas emissions? **Yes** No

- Percentage reduction: **12.1%** Over (m/yy - m/yy): **7/14-7/15**
- Initial GHG emissions rate (MT eCO₂/person): **0.321 (218.4 / 681)**
- Final GHG emissions rate (MT eCO₂/person): **0.282 (191.9 / 681)**
- Offsets: None
- How did you calculate the reduction? **(Utility Bill Based) EnergyStar Portfolio Manager calculates Total GHG Emissions and we divided this value by the capacity number of people (681).**

2. Do you track resource use in EPA ENERGY STAR Portfolio Manager? **Yes** No

- If yes, what is your score? **100**
- If score is above a 75, have you applied for and received ENERGY STAR certification?
 Yes **No** Year:

3. Has your school reduced its total non-transportation energy use from an initial baseline? **Yes** No

- Current energy usage (kBTU/student/year): **2471.8**
- Current energy usage (kBTU/sq. ft./year): **18.2**
- Percentage reduction: **10.3%** over (m/yy - mm/yy): **7/14 – 7/15**
- How did you document this reduction? **(Utility Bill Based) EnergyStar Portfolio Manager**

4. What percentage of your school's energy is obtained from:

- On-site renewable energy generation: **3.1%** Type: **Grid Electricity**
- Purchased renewable energy: **96.9%** Type: **Grid Electricity**
- Participation in USDA Fuel for Schools, DOE Wind for Schools or other federal or state school energy program: Yes **No**

5. In what year was your school originally constructed? **2012-2013**

- What is the total building area of your school? **75,930 sf**

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6. Has your school constructed or renovated building(s) in the past ten years? **Yes** No

For new building(s):

- Percentage building area that meets green building standards: 100%
- Total constructed area: **75,930 sf**
- Certification and year received: **1998**

For renovated buildings: **N/A**

- Percentage of the building area that meets green building standards:
- Total constructed area:
- Certification and year received:

Water and Grounds

7. Can you demonstrate a reduction in your school's total water consumption from an initial baseline?

- *Average Baseline water use (gallons per occupant): 935.7 gal per occupant per year (641.88 kGal / 686 occupants) (LEED 2009 for schools)*
- *Current water use (gallons per occupant): 553.9 Gal per occupant per year (379.76 kGal / 686 occupants)*
- *Percentage reduction in domestic water use: 40.8% reduction*
- *Percentage reduction in irrigation water use: Water use for irrigating plantings and groundcovers was initiated during the initial installation period to establish growth of the plants. After this period, water is used sparingly only during significant drought conditions to maintain growth. There is no formal irrigation system. Irrigation water use savings is approximately 90% over typical methods.*
- *Time period measured (mm/yyyy - mm/yyyy): 01/2013 – 01/2014*
- *How did you document this reduction? (ie. ENERGY STAR Portfolio Manager, utility bills, school district reports): Water Meter connected to building dashboard.*

8. What percentage of your landscaping is considered water-efficient and/or regionally appropriate?:

- *Types of plants used and location: Of the approximate 23 acres in groundcovers and plantings, none of the areas are irrigated. Therefore, 100% of the plants are water-efficient and suitable for the region.*
- *For groundcovers, Bermuda grass is used. Because of its deep root mat, Bermuda is one of the most drought tolerant of all the warm season grasses. Furthermore, it goes dormant during the winter.*

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- *All shrubs and trees were selected for their ability to grow in an urban setting with minimal maintenance and watering.*
- *The following plant types were used:*

Shrubs: Japanese Barberry, Dwarf Yaupon Holly, Pacific Wax Myrtle, Heavenly Bamboo

Trees: Chinese Elm, Crape Myrtle

Groundcover: Bermuda Grass

9. Describe alternate water sources used for irrigation. (50 words max)

As noted, the site does not have an irrigation system. Therefore, the only watering is periodically by hand with a spray hose during drought conditions.

10. Describe any efforts to reduce stormwater runoff and/or reduce impermeable surfaces. (50 words max)

Low Impact Development (LID) principals were used. Piping was limited to drainage away from the building and stadium filed. Runoff is addressed through a series of swales and sheet flow to groundcover and landscape areas. This treatment method allowed 100% rain water infiltration into the soil for aquifer recharge.

11. Our school's drinking water comes from:

- Municipal water source**
- Well on school property
- Other: (explain)

12. Describe how the water source is protected from potential contaminants. (50 words max)

A municipal water supply provides the school with treated domestic water. Backflow preventers are utilized at connections to equipment or systems that could cause contamination. Water filters are installed at each drinking fountain.

13. Describe the program you have in place to control lead in drinking water. (50 words max)

Lead free products have been utilized throughout the domestic water system.

14. What percentage of the school grounds are devoted to ecologically beneficial uses? (50 word max)

Of the 29.5 acres contained in the site approximately 23 acres is developed with groundcover and landscaping. As noted in item 10 above, this area provides for 100% infiltration of rainwater.

Waste

15. What percentage of solid waste is diverted from landfilling or incinerating due to reduction, recycling and/or composting? Complete all the calculations below to receive points.

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A - Monthly garbage service in cubic yards (garbage dumpster size(s) x number of collections per month x percentage full when emptied or collected): **64**

B - Monthly recycling volume in cubic yards (recycling dumpster sizes(s) x number of collections per month x percentage full when emptied or collected): **32**

C - Monthly compostable materials volume(s) in cubic yards (food scrap/food soiled paper dumpster size(s) x number of collections per month x percentage full when emptied or collected): **0**

- *Recycling Rate = ((B + C) ÷ (A + B + C) x 100): **33.3***
- *Monthly waste generated per person = (A/number of students and staff): **0.11***

16. What percentage of your school's total office/classroom paper content is post-consumer material, fiber from forests certified as responsibly managed and/or chlorine-free? **100%**

17. List the types and amounts of hazardous waste generated at your school: **NONE**

Flammable liquids	Corrosive liquids	Toxics	Mercury	Other:
<i>None</i>	<i>None</i>	<i>None</i>	<i>None</i>	<i>None</i>

- How is this measured?
- How is hazardous waste disposal tracked?
- Describe other measures taken to reduce solid waste and eliminate hazardous waste. (100 word max):

18. Which green cleaning custodial standard is used?

- What percentage of all products is certified? **100%**
- What specific third party certified green cleaning product standard does your school use?

Green Seal, Green Earth, and Eco Logo

Alternative Transportation

19. What percentage of your students walk, bike, bus, or carpool (2 + student in the car) to/from school? (Note if your school does not use school buses):

- How is this data calculated? (50 word max)

The vast majority of our students arrive at school via bus or car. In some instances, students have siblings in the same school or the neighboring elementary schools. Bike racks were installed in anticipation of future housing developments being built in the immediate vicinity of the school. Students will then have the option of walking or riding their bikes to school.



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20. Has your school implemented?

- Designated carpool parking stalls.
- A well-publicized no idling policy that applies to all vehicles (including school buses).**
- Vehicle loading/unloading areas are at least 25 feet from building air intakes, doors, and windows.**
- Safe Pedestrian Routes to school or Safe Routes to School
 - Describe activities in your safe routes program: (50 word max)

21. Describe how your school transportation use is efficient and has reduced its environmental impact. (50 word max)

Sandy Grove Middle School was built in a rural part of Hoke County, next door to an existing elementary school. The placement of this middle school eliminates the need for parents who have both elementary and middle school aged children to drive an additional 10+ miles to the nearest elementary school.

22. Describe any other efforts toward reducing environmental impact, focusing on innovative or unique practices and partnerships. (100 word max)

Installed at Sandy Grove Middle School are multiple electric car charging stations. With this addition to the school, developers were looking into the future. Currently, these stations are not used on a regular basis. The hope is that their availability will promote the idea of alternative, fuel efficient vehicles among our community.

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

Environmental Health

1. Describe your school's Integrated Pest Management efforts, including IPM/green certifications earned, routine inspections, pest identification, monitoring, record-keeping, etc.:

The Hoke County Board of Education has implemented a Pest Management School Board Policy. Sandy Grove Middle School utilizes Integrated Pest Management (IPM) programs and uses an outside agency to conduct the bulk of its pest management.

IPM is a comprehensive approach that combines effective, economic, and environmentally sound and socially acceptable methods to prevent and solve pest problems. The school includes pest management considerations in facilities planning and maintenance. The IPM contact person, in conjunction with the school system's contracted pest management professional, will recommend to the superintendent any landscaping changes, structural modifications and sanitation changes needed to reduce or prevent pest problems. The superintendent will review such recommendations and may authorize action to address necessary minor changes in a timely manner, as the budget permits. For significant changes or changes that require a significant expenditure of funds, the superintendent will recommend changes to the board for approval.

Records of all pest management activities must be maintained, including inspection records, monitoring records, pest surveillance data sheets or other indicators of pest populations, and records of structural repairs and modifications. If pesticides are used, records must be maintained on site to meet the requirements of the state regulatory agency and school board.

2. What is the volume of your annual pesticide use (gal/student/year)? Describe efforts to reduce use:

1.28 oz per student per year

3. Which of the following practices does your school employ to minimize exposure to hazardous contaminants? Provide specific examples of actions taken for each checked practice.

Our school prohibits smoking on campus and in public school buses.

Our school has identified and properly removed sources of elemental mercury and prohibits its purchase and use in the school.

Our school uses fuel burning appliances and has taken steps to protect occupants from carbon monoxide (CO).

Our school does not have any fuel burning combustion appliances.

Our school has tested all frequently occupied rooms at or below ground level for radon gas and has fixed and retested all rooms with levels that tested at or above 4 pCi/L OR our school was built with radon resistant construction features and tested to confirm levels below 4 pCi/L.

Our school has identified any wood playground or other structures that contain chromate copper arsenate and has taken steps to eliminate exposure.

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4. Describe how your school manages and controls student and staff exposure to chemicals (including pesticides) routinely used in the school. (100 word max)

Staff, students, pest managers, parents and the public will be informed about potential school pest problems, school IPM policies and procedures, and their respective roles in achieving the desired pest management objectives. Each year, the principal or designee will ensure that the student handbook includes the schedule of anticipated pesticide use on school property and a notice to parents, guardians and custodians of their right to request notification of nonscheduled pesticide use. Additionally, the principal or designee shall annually notify school staff of scheduled pesticide use on school property and of their right to request notice of nonscheduled pesticide use. Notice of nonscheduled pesticide use should be made at least 72 hours in advance of such use, to the extent possible.

5. Describe actions your school takes to prevent exposure to asthma triggers in and around the school. (100 word max)

The facility provides students with a clean, healthy learning environment through controlled indoor air quality, which limits toxins and pollutants in the air. ASHRAE 62 Ventilation Rate Procedure was used to specify outside air requirements. Dedicated outside air units provided conditioned outside air directly to classroom spaces. This allowed design team to take advantage of energy savings allowed direct control for occupancy levels and ensure full ventilation requirement is delivered to the space when needed. High occupancy spaces such as the gymnasium and cafeteria utilize CO2 sensors in the space to control ventilation rates and turn down based on occupancy.

6. Describe actions your school takes to control moisture from leaks, condensation, and excess humidity and promptly cleanup mold or removes moldy materials when it is found. (100 word max)

In order to design and construct a high-performing building enclosure for Sandy Grove, the architect employed a number of strategies to create a highly insulated, airtight envelope. For starters, a big focus was placed on sealing the connection between the roof and wall, which is normally a big culprit of air infiltration and energy loss in buildings. The next priority was detailing the air barrier at the windows and doors to integrate with closed cell polyurethane spray foam, which served as both continuous insulation and a whole building air barrier on top of the concrete masonry construction. To ensure that the enclosure was installed as specified, Sfl+a held on-site preparatory meetings with the construction crew, who also benefited from an 8-ft. mock-up wall with all the key details and a 3D layering model of the flashing specifications. The roof has a high insulation level of R-29, compared to a baseline R-20, with 8 inches of rigid insulation. With the PV panels covering 80% to 90% of the roof, this also helps absorb a certain percentage of solar heat gain, thereby keeping the roof cooler.

7. Our school has installed local exhaust systems for major airborne contaminant sources.

Yes **No**

8. Describe your school's practices for inspecting and maintaining the building's ventilation system and all unit ventilators to ensure they are clean and operating properly. (100 word max)

The school is currently under contract. All systems are in proper working under.

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9. Describe actions your school takes to ensure that all classrooms and other spaces are adequately ventilated with outside air, consistent with state or local codes, or national ventilation standards. (100 word max)

Sandy Grove Middle School has state of the art ventilations systems and controls.

10. Describe other steps your school takes to protect indoor environmental quality such as implementing EPA IAQ Tools for Schools and/or conducting other periodic, comprehensive inspections of the school facility to identify environmental health and safety issues and take corrective action. (200 word max)

To ensure thermal comfort requirements of ASHRAE 55 were met, the design team used thermal comfort modeling software. Personal factors, operative temperature, air speed and humidity levels were factored into design considerations and prediction models to limit the percentage of dissatisfied people to less than 10% per ASHRAE Std 55-2004 guidelines.

Nutrition and Fitness

11. Which practices does your school employ to promote nutrition, physical activity and overall school health? Provide specific examples of actions taken for each checked practice, focusing on innovative or unique practices and partnerships. (100 word max each)

Our school participates in the USDA's HeathierUS School Challenge.

Level and year:

Our school participates in a Farm to School program to use local, fresh food.

Our school has an on-site food garden.

Our school garden supplies food for our students in the cafeteria, a cooking or garden class or to the community.

Our students spent at least 120 minutes per week over the past year in school supervised physical education.

At least 50% of our students' annual physical education takes place outdoors.

Health measures are integrated into assessments

At least 50% of our students have participated in the EPA's Sunwise (or equivalent program).

Food purchased by our school is certified as "environmentally preferable"

Percentage: 50% Type: Produce

12. Describe the type of outdoor education, exercise and recreation available. (100 word max)

In addition to in-school physical education courses, students have the opportunity to engage in a vast array of sports, including: football, volleyball, cheerleading, track, golf, basketball, wrestling, baseball, softball, and soccer.

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13. Describe any other efforts to improve nutrition and fitness, highlighting innovative or unique practices and partnerships. (100 word max)

Hoke County Schools' Strategic Plan includes as one of its five priorities "Every student will be healthy, safe, and responsible." The district's administration, teachers, parents and community members have collaborated to create goals by which to measure the progress of this priority.

Coordinated School Health, Mental Health, School Climate, and Safety

14. Does your school use a Coordinated School Health approach or other health-related initiatives to address overall school health issues? Yes No

If yes, describe the health-related initiatives or approaches used by the school:

The Coordinated School Health team at Sandy Grove Middle includes the school nurse, school social worker, school counselor, health and PE teachers, cafeteria manager, and school administrators. In addition, the school has implemented the Positive Behavior Intervention Support Initiative.

15. Does your school partner with any postsecondary institutions, businesses, nonprofit organizations, or community groups to support student health and/or safety? Yes No

If yes, describe these partnerships:

Sandy Grove Middle partners with the Hoke County Health Department to provide various health presentations, such as nutrition and diabetes education. The Hoke Cooperation Extension Program-4-H Specialist provides social skills group.

16. Does your school have a school nurse and/or a school-based health center? (X) Yes () No

A school nurse.

17. Describe your school's efforts to support student mental health and school climate (e.g. anti-bullying programs, peer counseling, etc.):

The district's Student Support Services department provides anti-bullying education, social skills classroom instruction and individual/group sessions for students. The team uses health and physical education to conduct a month long unit on mental and emotional health, covering topics such as: bullying (bystander, victim, and perpetrators), cyber bullying, digital citizenship, key indicators for depression and suicide, where and who to contact for help, self-esteem, and self-concept awareness. The team also consults with the school psychologist regarding various mental health issues. The school has a Student Assistance Team Program that addresses student behavior and academic issues. Sandy Grove Middle also has a Military Family Support Counselor who provides services to our military-connected students.

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Pillar 3: Effective Environmental and Sustainability Education

1. Which practices does your school employ to help ensure effective environmental and sustainability education? Provide specific examples of actions taken for each checked practice, highlighting innovative or unique practices and partnerships.

Our school has an environmental or sustainability literacy requirement. (200 word max)

Teachers at Sandy Grove Middle conduct a lesson titled “Basic Sustainable Energy – Solar Energy and Geothermal Heating and Cooling.” The content of the unit project is comprised of higher level vocabulary words based from reading and research, and from technical terms used in the process of building and designing of solar cars and mini-solar powered systems. Collaboration with other students will develop their speaking, listening, and writing skills as they design, build, test their solar cars, gather data, and as they share their work to their peers in a technology-oriented environment.

Environmental and sustainability concepts are integrated throughout the curriculum. (200 word max)

Students complete coursework on Basic Sustainable Energy – Solar Energy and Geothermal Heating and Cooling. At the end of this coursework, students should be able to:

- design a solar-powered car to demonstrate how solar panels harness the rays of the sun to create an energy source*
- design a system using mini-solar panels that will run a load in an electrical circuit or a school building system*
- create a 3D animation to communicate to other students how geothermal heating and cooling works*

Environmental and sustainability concepts are integrated into assessments. (200 word max)

Pre-tests and post-tests are given using an online test. Prior knowledge activities include class and group discussion and online collaborative brainstorming of ideas. There are tests, question-and-answer periods, and discussion for every activity that serve as formative assessments to give feedback to the teacher whether to move on to the next step, or spend more time, and to note students who may need extra help.

Students evidence high levels of proficiency in these assessments. (100 word max)

Aside from collecting information from the SGMS Dashboard, students collaborate, plan, design, build, and test using the engineering process about their solar projects and their geothermal heating and cooling presentation. Students share their work and collected data through multi-media technology so they can furthermore receive feedback and reflect on their work for modifications if needed. Challenge activities are given as an extension of the project. These activities include calculating velocities of solar cars, testing gear ratios, modifying

solar car design, and comparing information from the data sheet.

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Professional development in environmental and sustainability education are provided to all teachers. (200 word max)

All staff members at Sandy Grove Middle have received training on the building's features, including: LED lighting (Cree Lighting), solar panels (Solar Spotlight), the dashboard (Lucid), and water conservation.

2. For schools serving grades 9-12, provide: **N/A**

- Percentage of last year's eligible graduates who completed the AP Environmental Science course during their high school career:
- Percentage scoring a 3 or higher:

3. How does your school use sustainability and the environment as a context for learning science, technology, engineering and mathematics thinking skills and content knowledge? (200 word max)

Sandy Grove Middle School was designed with state of the art technology to emphasize the importance of Science, Technology, Engineering, and Mathematics (STEM) in preparing students for life in the 21st century by using the school as a teaching tool. The staff has embedded the school's resources into the curriculum to provide hands-on activities and research-based projects for students to apply in a real-world scenario. The students have the ability to learn about solar energy, energy and water conservation, air quality, geothermal and recycling.

4. How does your school use sustainability and the environment as a context for learning green technologies and career pathways? (200 word max)

Teachers use lessons to address the need to harness sustainable energy instead of other sources of energy that could harm our environment. The SGMS building is designed also as a learning tool for students to learn about sustainable energy such as solar energy and geothermal heating and cooling. The lessons also aim to encourage students in pursuing careers in STEM fields. The next generation of students will need skills and tools related to the use of highly-advanced technological systems in the future. This unit is a good response to the nationwide effort of President Obama's "Educate to Innovate" Campaign for Excellence in STEM Education, the NC Statewide STEM Education Strategic Plan, and Hoke County Schools' "Into the Future" Becoming a 21st Century learning System Strategic Plan.

5. Describe students' civic/community engagement projects integrating environment and sustainability topics. (200 word max)

The SGMS building is incorporated into all content areas, including Social Studies. Students learn that it is important to conserve and use energy wisely because it not only affects citizens financially but also affects our environment, as well as our future.

6. Describe students' meaningful outdoor learning experiences at every grade level. (200 word max)

Teachers teach Environmental and Sustainability Education as an interdisciplinary lesson the first week of school across all grade levels as it addresses their content by using the building as a learning tool. Students develop knowledge of the interconnections of ecological, social, and economic systems. They demonstrate understanding of how the health of these systems determines the sustainability of natural and human communities at local, regional, national, and global levels through social studies and English Language Arts classes.

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7. Describe how outdoor learning is used to teach an array of subjects in contexts, engage the broader community, and develop civic skills. (200 word max)

Students engage in inquiry and systems thinking and use information gained through learning experiences in, about, and for the environment to understand the structure, components, and processes of natural and human-built environments in social studies and ELA. Students develop and apply the knowledge, perspective, vision, skills, and habits of mind necessary to make personal and collective decisions and take actions that promote sustainability through science and health by teaching their families the importance of solar and water conservation.

8. Describe your partnerships to help your school and other schools achieve in the 3 Pillars. Include both the scope and impact of these partnerships. (Maximum 200 words)

Partnerships between Sandy Grove Middle and the various companies used during the construction process have exposed our students to aspects of environmental learning unlike any other. Cree Lighting, Spotlight Solar, Lucid (dashboard) and SfL+a Architects have all provided our school community with a vast array of resources to contribute to the learning process and to educate our students and their families of the green features found inside the school and how they impact their daily lives.

9. Describe any other ways that your school integrates core environment, sustainability, STEM, green technology and civics into curricula to provide effective environmental and sustainability education, highlighting on innovative or unique practices and partnerships. (Maximum 200 words)

The curriculum at SGMS was developed to engage young people in Material Science Engineering, Geochemistry, Electrical and Chemical Engineering to demonstrate how materials react with solar energy converting it into electricity for practical uses as well as harnessing geothermal energy for the same purpose. As a LEED Platinum Designed public school, SGMS harnesses the energy of the sun converting it into electrical form through solar panels of photovoltaic cells (PV). The solar energy produced and consumed by SGMS will be studied by students using the data in the SGMS Dashboard and by simulation using models such as the solar-powered car (Pitsco SunEzoon Car kit) and LEGO sustainable energy kits. In addition, students will learn how the geothermal heating and cooling works in the building. Geothermal heating and cooling will be simulated and explained by students using a 3D computer animation of pre-Java codes. Using this technology, students will be able to communicate in a better way while applying lessons learned about SGMS green building features and STEM concepts.

2016 Green Ribbon Schools Application



Students at Sandy Grove Middle School participate in robotics competitions.



Electric car chargers are available in front of the school. Anyone is welcome to utilize this feature of the school at no charge



2,358 solar panels cover the entire roof of Sandy Grove Middle, producing enough energy to power more than 68



Students conduct experiments in the state-of-the-art science lab.

2016 Green Ribbon Schools Application



The media center at Sandy Grove Middle accommodates multiple needs. Tables allow students to collaborate, while an entire class can have a lesson using the interactive Smart Board. Students also have access to additional computers for research.



Students use the gymnasium for both learning and sports.



Sandy Grove Middle offers an inviting entrance to students, with four 20-foot solar structures acting as the focal point and igniting an exciting conversation about what it means to be green