



Maryland State Department of Education Service-Learning Fellows Project

Greenhouse

Gateway/Crossroads Schools, Carroll County, Service-Learning/S.T.E.M./Green School,
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Primary Subject: Experiential Ed

Grade Level: Alternative Middle/High

Additional Subject Area Connections: Science Research, Math, Foundations of Technology, Biology, Ecology

Unit Title: Greenhouse

Type(s) of Service: Direct

Unit Description: Students were responsible for grant writing, site planning, coordination with Lowe’s, and construction of our school greenhouse. The greenhouse will be used to house our wetland nursery for which we have partnered with the National Aquarium in Baltimore.

Potential Service-Learning Action Experiences:

Students were responsible for every phase of this project. The planning and communication with Lowe’s being some of the most interactive aspects, gave our students the opportunity to improve their communication and interpersonal skills. The greenhouse will continue to offer our students service-learning opportunities as we grow wetland plants for the aquarium, grow vegetables for a future community vegetable garden, and as we grow native trees and plants to replace the invasive plants we remove on and around our school campus.

Maryland Curriculum Standards Met

Ecology/Biology:

- 3.5.1 The student will analyze the relationships between biotic diversity and abiotic factors in environments and the resulting influence on ecosystems.
- 3.5.2 The student will analyze the interrelationships and interdependencies among different organisms and explain how these relationships contribute to the stability of the ecosystem.
- 3.5.3 The student will investigate how natural and man-made changes in environmental conditions will affect individual organisms and the dynamics of populations.
- 3.5.4 The student will illustrate how all organisms are part of and depend on two major global food webs that are positively or negatively influenced by human activity and technology.

Please see end of document for more.

Alignment with Maryland's Best Practices of Service-Learning: *Greenhouse*

1. Meet a recognized community need (*e.g. What health, education, environment or public safety need was met? How did you determine there was a real need in this area? Who was helped by your project?*)

Our students identified the need to have alternative learning spaces at Gateway/Crossroads. They pulled from their own personal experiences and recognize that hands on activities engage their mind and body. Most agreed that they learn better this way.

Our students also have been working on projects related to our "Go Green Initiative." The greenhouse is a place where we can contribute to the overall health of the Chesapeake Bay watershed by partnering with the National Aquarium in Baltimore to grow wetland plants. These plants will be installed along the shores of the bay to help filter and clean the water. Again, this offers our students hands on learning and a chance for our students to see up close how the wetlands work to clean the bay.

We also help to support the health of the Chesapeake Bay watershed by improving the overall health of our school campus. We have a native labyrinth garden that the students maintain. Our students remove invasive plants from our campus and replace them with native plants donated to us by Carroll County's Outdoor school program. With our greenhouse, we hope to grow some of our own native plants and trees.

Finally, we have also partnered with the Maryland food bank and are a food distribution site. Our students comment on the quality of the food in our cafeteria and on the need to offer our food bank recipients fruits and vegetables in addition to the staples. One of our future projects is to create a community vegetable garden that our students maintain. This food will be served in our cafeteria to supplement our school lunches and offer nutritious alternatives as well as the produce will be distributed to our food bank recipients.

2. Achieve curricular objectives through service-learning (*How did the project reinforce or enhance student academic learning?*)

All of the projects that we take on directly align with curricular learning outcomes from the content areas involved; specifically S.T.E.M. (Science, Technology, Engineering, and Math). Our S.T.E.M. committee meets bi-weekly to update project goals and to collect lesson plans, work samples, and reflections for our student portfolios. The greenhouse met curricular objectives in all S.T.E.M. areas offered at our school.

Our students have not been successful in their comprehensive school for a variety of reasons, so the hands on, real world application of their academics demonstrates why they need that certain class or why that knowledge is helpful to their lives. This not only helps them to "buy in" to their academics but it gives them a chance to apply and practice their skills in context. Our students find great success and fun in learning this way.

3. Reflect throughout the service-learning experience

(What types of activities did students engage in to reflect on their project?)

The students that were a part of the greenhouse project not only provided work samples, plans, and photo collages to document the project, but each was responsible for writing reflections throughout the process. These reflections were added to our Service- Learning, Green School, and S.T.E.M portfolios.

4. Develop student responsibility project. (How did students have opportunities to make decisions about the service- learning project and take on leadership?)

Our students are led through an investigative process which provides them with background information needed to determine the best way to solve the problems found by way of the investigation. Our students then propose solutions, create budgets and plans, and assist in helping to find funding. Each project is assigned a project manager. For the greenhouse, we had a student that coordinated the entire installation with

Lowe's by phone calls with the manager. He made almost a dozen phone calls and our installation went flawlessly. Our installation manager was out on site for every phase of the project and because he had experience in construction, he led his fellow students through the plans and construction phase. We had several students responsible for inventory of the multiple parts, fasteners, and panels. All of our S.T.E.M. related classes provided research, information, and assistance in their area of expertise to make this project happen.



5. Establish community partnerships (With what community partners did you collaborate? Non-profits, civic organizations, businesses that provided donations, etc.)

We establish community partnerships with one or more organizations with every service project. Our greenhouse project started a partnership with the Lowe's store in Westminster. They were not only helpful throughout the process but they sent out three employees to work side by side with our student during construction. They provided their expertise, demonstrated skills and assisted our students in those skills, and demonstrated appropriate professional behaviors to our students.

With our greenhouse complete, we can now begin our partnership with the National Aquarium in Baltimore. We will be growing wetland plants for future installation in the bay.

We will continue to support our partnership with Carroll County's Outdoor School at Hashawha by growing native trees and shrubs, thus assisting them in their mission to remove invasive plants and replace them with natives.

We plan to expand our partnership with the Maryland Food Bank by growing fresh vegetables to offer to our food bank recipients.

When we applied for and received our Green School certification from MAEOE, we were congratulated for our success in the area of establishing community partnerships. Schools are often weak in this area of the application process.

6. Plan ahead for service-learning (*How did you prepare and plan for the project?*)

All of our projects, including the greenhouse, began with an investigation by our students. After completing several other projects around our campus, a student mentioned that it would be cool to have a greenhouse so that we could grow our own native plants/trees. From this point, we researched grants for such a project and applied to Lowe's for \$5000 to cover the entire cost of the project and supplies needed to begin. I made the initial contact with the local Lowe's manager but from that point on, all of the phone calls and project coordination was handled by students.

Lowe's sent out employees to assist with the construction but our students inventoried parts, assisted the Lowe's employees, and actually finished the construction on their own.

As mentioned above, we have many future plans for our greenhouse. Maintaining current community partnerships is important and expanding upon those partnerships is the goal of the community vegetable garden the native nursery, and expanding the wetland nursery to include our Striped Bass. Our students are already in the planning phases for the next phase.

7. Equip students with knowledge and skills needed for service (*What did students learn through the experience?*)

All of our students take on responsibility for different aspects of the projects. Some organize the materials, some plan, some make phone calls to coordinate with our community partners, some lead installation teams, and some offer technical support. These assignments are based on strengths, need, interests, and class size. We address not only the academic need of our students but because they are alternatively placed here at Gateway or Crossroads, they also have socio-emotional and behavioral needs that our service-learning projects help to address. These projects create an environment where student responsibility, communication, social skills, and behavior go hand in hand with the academics. As our students meet a community need completing the projects, they also meet a need within themselves. It truly is a win win! With the success found through service-learning, many of our students are now less apprehensive about making the contacts, taking the chances, and taking action in their local community because they have already done it with so much success here at school.

Maryland Curriculum Standards Met Continued

Impacts of Technology:

The Nature of Technology:

Students will develop an understanding of the nature of technology.

- Indicator Statement: Identify and use resources and strategies for keeping abreast of advances in technologies. (MD CLG, Skills for Success)
- Identify and demonstrate how the selection of resources involves trade-offs between competing values, such as availability, cost, desirability, and waste.
- Explain that quality control is a planned process to ensure that a product, service, or system meets established criteria.

The Impacts of Technology:

Students will develop abilities to assess the impacts of technology.

- Explain and demonstrate how humans can devise technologies to conserve water, soil, and energy through such techniques as reusing, reducing and recycling.

Technological Issues:

The Nature of Technology:

Students will develop an understanding of the nature of technology.

- Indicator Statement: Analyze the connections that exist both within the various fields of science and among science and other disciplines including mathematics, social studies, language arts, fine arts, and technology. (MD CLG, Science)
- Demonstrate how many technological problems require a multidisciplinary approach.

Science Research Outcomes:

1.1 The student will explain why curiosity, honesty, openness, and skepticism are highly regarded in science.

1.2 The student will pose scientific questions and suggest investigative approaches to provide answers to questions.

1.3 The student will carry out scientific investigations effectively and employ the instruments, systems of measurement, and materials of science appropriately.

1.4 The student will demonstrate that data analysis is a vital aspect of the process of scientific inquiry and communication.

1.5 The student will use appropriate methods for communicating in writing and orally the processes and results of scientific investigation.

1.6 The student will use mathematical processes.

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Carroll County Public Schools



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