



**Rain Garden Service Learning Project +  
Vignette**  
Source: DTE Freshwater Institute – Western  
Michigan University

**General Information:**

Grade Level(s): 7-12

Department(s): Science/environmental studies

**Background Information:**

A simple concept for managing what happens to rainwater in urban and suburban landscapes, called a rain garden, is gaining in popularity across the country. Rain gardens pose an incredible opportunity to educate people about the issue of storm water while allowing people to take effective action to decrease their contribution to the problem.

A rain garden is a garden which takes advantage of rainfall and stormwater runoff in its design and plant selection. Usually, it is a small garden which is designed to withstand the extremes of moisture and concentrations of nutrients, particularly Nitrogen and Phosphorus, which are found in stormwater runoff. Rain gardens are sited ideally close to the source of the runoff and serve to slow the stormwater as it travels downhill, giving the stormwater more time to infiltrate and less opportunity to gain momentum and erosive power.

**Project Description:**

Students will work with the school administration and maintenance staff to design and implement a school-yard rain garden. The rain garden can eventually serve as an outdoor learning lab for younger students.

**Community Need(s):**

Many residents do not realize that simple actions they implement can have dramatic impacts on the quality of our water. Rain gardens absorb runoff from rooftops and help improve the quality of our lakes, rivers, and streams.

**Potential Community Partner(s):**

Genesee County Drain Commissioner's Office  
Genesee County Conservation District  
Ruth Mott's Applewood Estate  
Local plant nurseries  
Keep Genesee County Beautiful

**Content/Skill(s):**

Science  
Language Arts

**Project Components:**

- Students complete a campus stormwater audit by monitoring storm water runoff as it occurs, noting the direction of runoff and low spots where water collects
- Students research probable locations, conduct soil tests, and determine potential plants suitable for the area
- Students design, plant, and maintain their garden
- Students work with community organizations/businesses that can advise the process
- Students present their garden idea to administration, community organization, and the school district
- Students engage middle and elementary students in the care and use of the rain garden

**Reflection Prompts:**

- Students create a photo essay showing the area before and after the project.
- Students write a reflective essay on the following question: What factors led to the problems we currently have regarding storm water?

**Outcomes:**

- Students will be able to determine the key storm water problems on their campus
- Students will be able to describe the connection between storm water problems on campus and how rain gardens can address some of those issues
- Students will be able to recognize some Michigan native plants and describe ecological relationships

**Accommodations/Support for Diverse Learners:**

- Appropriate tasks should be assigned to all students.
- Students should be encouraged to work collaboratively and respect the talents of each of the members of their group.
- Locations should be accessible. When not available, alternative sites should be sought.
- Each group member should have equal opportunities to make significant contributions to the project.

### **Rain Garden Service Learning Project – Vignette**

A long uphill driveway takes visitors to the parking area of this combination middle/high school, located on a hill just up from the main street of this town. This one-story flat-roofed school replaced an older structure a few years ago. In re-grading the school grounds for the new construction, engineers designed the area so “run-off” rain and snow melt from the expansive flat roof and parking areas could funnel into two large grass-covered earthen basins. During storms, water accumulates in these approximately 40’ x 40’ five-foot deep catch-basins, allowing it to slowly percolate into the soil, avoiding erosion and street flooding downhill from the school.

The teacher from this school decided to turn one of these basins into a “rain garden.” This would be a year-long project for the 22 students in her environmental science class. In addition to the student learning and skill development that would take place, the goal for the project was to improve the school yard with a permanent “garden” that could also be used by younger students

as an outdoor learning lab. Subsequent high school classes would help maintain and enhance the rain garden.

The teacher provided various background materials and students did web-based research about rain gardens to determine what might be possible at their site. Measurements of the area were made. Previous observations of the site showed that during heavy rains, several feet of water could accumulate in the basins and then slowly seep into the soil. Sometimes the water would remain for several days. This would clearly be a factor in selecting plants adapted to these conditions.

The teacher and students presented their rain garden idea to the principal and school maintenance personnel and received approval to proceed. The next step was to prepare a layout for the garden. There would be a contest! Each student created a design for the garden, showing walkways and planting areas. Many students created elaborate and complex geometric plans, colorfully illustrated on large posters. When all designs were complete, students judged them for suitability for the site, esthetics, feasibility in development, and practicality in maintenance. Top-rated plans were then discussed and a winner selected. The winning design framed the site with perimeter grassed walkways and off-set diagonal crossing paths through the center of the garden. The four triangular-shaped areas would be the planting areas.

A local nursery became the community partner for this project, advising students on the suitability of particular plants for the garden conditions. The nursery would also obtain the plants and advise on the planting design and schedule. Grant funding was used to pay for the materials and upkeep.

Actual work on the garden began in April, with the pathways and planting areas being prepared. Students used shovels and wheelbarrows to prepare the site, working during part of their regular class time and before and after school. As plants became available, they were placed according to the plan. By the end of the school year, about half of the plants were in place. Additional work would occur during the summer and again in the fall. A major challenge for students was the lack of easily accessible water. This necessitated students carrying water in buckets from the school building to the site. They enlisted help from middle school students. Plans call for labeling of garden plants, as well as engaging students from elementary and middle school in the project.

As part of their regular environmental science curriculum, students had also been learning about ecology and plant/animal relationships, water quality (including testing water at a nearby lake with members of the lake association), and invasive species. As part of a mini-grant from Lowe's home improvement store, it was decided that students would prepare permanent posters about invasive species that would be weatherized and placed on posts around the perimeter of the rain garden. Posters were based on research and illustrations gathered by students from the Internet. Students also created a major public wall art piece that included ceramic tiles with nature-themed artwork and poems.

When asked what they had learned as a result of this project, students indicated that it was a lot of hard work and required perseverance and patience. None had been involved in such a long-term project in their school careers. Some had done community-based projects through scouts

and other youth group activities. This group of students was clearly proud of their work, and contribution to the school. The teacher indicated that some students take the environmental science class as an alternative to the regular science sequence. She tries to engage them in more relevant and real-world projects.