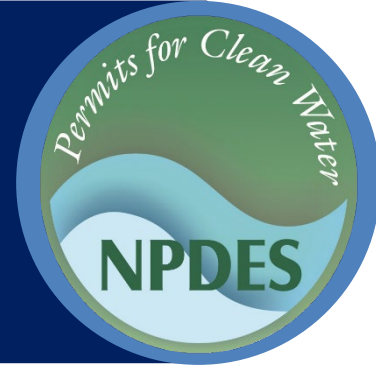




Stormwater Best Management Practice

Classroom Education on Stormwater



Minimum Measure: Public Education and Outreach on Stormwater Impacts
Subcategory: Promoting the Stormwater Message

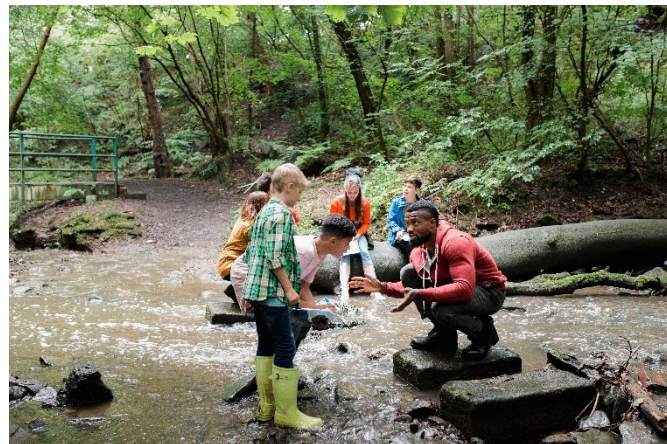
Description

Classroom education can be a valuable part of any municipal stormwater outreach program. Municipalities can develop student materials and curricula to help schools incorporate stormwater messaging into their current science lessons. This can have many benefits. Children who receive this outreach will learn about environmental stewardship early and are therefore more likely to become interested, and perhaps involved. Students also often tell their families what they learn in school, passing on environmental awareness to adults in their communities.

Many municipal stormwater programs partner with educators and experts to develop stormwater-related programs for the classroom. These lessons don't need to be elaborate or expensive to be effective. A municipality can align programming with a school district's curriculum goals, making stormwater education a great way to integrate the two programs. Municipalities should work with school officials to identify their needs and provide support and materials that align stormwater program goals with curriculum goals. For example, municipalities can provide a range of educational aids, from simple photocopied handouts, posters and slide shows to more costly and elaborate working models and displays.

Understand the Audience and Current Practices

Building a strong relationship with the school district is the most important step in sharing helpful local stormwater education materials with educators. One of the first points to discuss is what, if any, stormwater education programs the schools already implement—or would want implemented if they had the resources to do so. Municipalities can encourage schools to conduct surveys or assessments to understand students' baseline knowledge of stormwater and pollution management. For these assessments, municipalities can provide schools with sample questions designed to gather relevant information. This will help determine the level of information to include in an education program.



Hands on field trips can be a fun and engaging way to teach children the basics about stormwater and its relationship to nature.

Municipalities can then work with schools to support stormwater curricula and provide resources when needed.

Decide on an Approach

When crafting a classroom education program or helping schools do so, a municipality should first collaborate with the school(s) to determine a program approach. The municipality should work with schools to decide which types of outreach and materials will best fit the needs of the community's schools, teachers and students. Here are some questions to consider:

- What age ranges will the program target?
- Will the focus be on students in preschool, elementary school, middle school or high school?
- Should the curriculum be grade-level-specific?
- Will the program involve a year-long study, a semester, a special topic or event, or a single presentation by an organization?
- What special equipment might schools need? For example, the municipality might purchase a small-scale watershed model that it can loan to schools for demonstrations.

The school district's needs and the municipal resources available will determine the answers to these questions.

Some teachers may need help with lesson plans or resources to use in the classroom; others may appreciate more interactive approaches like in-class presentations or videos, field trips to view stormwater treatment controls in the community, or after-school workshops. Some schools may need professional development opportunities for educators to help them gain a better understanding of what they are teaching. Municipalities can suggest combining or modifying approaches based on the information gathered from the discussions with the school districts.

Provide Classroom Materials and Lesson Plans

Activity sheets, handouts, and other classroom materials, like models and experiments, are great resources to teach kids about stormwater management and stormwater pollutants. However, the time commitment and cost of developing or purchasing new materials may limit an educator's ability to incorporate stormwater education into their lesson plans. Municipalities can help by creating these resources and providing them to schools.

Municipalities can encourage educators to use existing resources, such as the U.S. EPA's [resources for students and educators about nonpoint source pollution](#). Schools can incorporate these resources into existing curricula, including lesson plans about local watersheds and waterways and pollution prevention. Additional resources include the University of Nebraska–Lincoln's [stormwater activity sheets](#) and Project Wet's [educational materials](#). The stormwater activity sheets include a variety of fun projects for kids, such as making their own watershed model to learn about the impacts of stormwater pollutants on local waterways. Project Wet offers water-related activity booklets and digital lessons. Municipalities can conduct outreach to promote these activities to schools or go a step further and provide the booklets or supplies needed to complete one of the projects.

Municipalities can also design and create their own educational materials to supply to schools. For example, the [City of Los Angeles's Department of Sanitation](#) developed a myriad of classroom materials, including the [Clean Water Patrol Activity Book](#) (available in both English and Spanish), posters, colorful vinyl stickers with clever stormwater sayings such as "You Otter Not

Pollute," and cartoons reminding kids to keep trash out of waterways. Educators can download any of these materials or request hard copies from the department.

In addition to classroom handouts and activity sheets, municipalities can develop lesson plans focused on stormwater and pollution prevention to distribute to educators. A lesson plan provides details and instructions that guide the teacher through a lesson. For example, the City of Eugene (Oregon)'s Stormwater Management Program offers [free curriculum kits](#) for kindergarten through eighth grade classes, each at an age-appropriate level, that cover water and the effects of pollution in water systems, the water cycle, and local ecosystems. The kits include lesson plans and handouts educators can download. The program also has individual worksheets from the kits that teachers can use if they don't have time to cover everything included in the curriculum kit.

Offer Professional Development Opportunities for Teachers

Kids aren't the only ones who can benefit from stormwater and pollution education and outreach. Municipalities can offer professional development opportunities for teachers to enhance their understanding of stormwater topics and give them the tools to pass that knowledge to their students. Many municipalities have created programs for educators or partnered with existing organizations. For example, Prince George County, Maryland, partnered with the Anacostia Watershed Society to present the [Treating and Teaching program](#) to public school staff. The goal of the program was to show educators how they can use their school grounds, including existing stormwater management projects, as educational tools to supplement their curricula. Municipalities can also partner with environmental education nonprofit organizations that provide environmental educational development programs for teachers. For example, Islandwood has a variety of [virtual and in-person trainings](#) for teachers of all grade levels who seek to incorporate science education, including stormwater management, into their lessons.

Lead Classroom Presentations or Lessons

Some municipalities' stormwater program staff visit schools and give presentations to classrooms. As part of its Stormwater Quality Improvement Program, the Sacramento (California) Department of Utilities created

presentations for third through fifth graders designed to introduce the water cycle and aquatic food chain, as well as explain how pollutants enter waterways. The presenters engage students through handouts, posters and live demonstrations. Municipalities can also offer virtual presentations or lessons that schools can incorporate into classes.

Interactive Learning Programs

Another way municipalities can reach young members of their communities is through hands-on learning programs or workshops. These programs can run during school hours as field trips or as optional after-school programs. They can also incorporate methods like simply looking out classroom windows to observe how the stormwater flows and identify what sort of pollutants could be carried by the stormwater into nearby waters. For example, Fairfax County, Virginia, offers a [variety of educational programs](#) for different age groups. The county offers a “Stream Crime Investigation Lab” for high schoolers focused on tracking and stopping common pollutants from entering local waterways. Students of all ages can participate in “Revitalize, Restore, Replant!” to learn about stormwater and ecosystem management through a hands-on native plant installation. Schools can sign up and take classes on a field trip to participate.

Meanwhile, the California Water Boards developed an after-school program, “[Water Quality Detectives](#),” that it offers to schools across the state. The goal of the program is to teach students about stormwater through “service learning,” which helps students “master important curriculum content by making meaningful connections between what they are studying and its many applications” (California Water Boards, n.d.). Students complete a campus water runoff study that demonstrates how various pollutants, such as trash, pesticides and motor oil, can travel off school grounds into nearby storm drains that lead to waterways. Students then devise projects based on what they learned, such as creating websites, forming campus recycling clubs, and conducting neighborhood

canvassing and civic group presentations on water pollution prevention.

Evaluate Program Effectiveness

The effectiveness of a classroom education program approach depends on many factors. The lessons and activities should be interesting, engaging and targeted to the appropriate age groups. Municipalities can evaluate stormwater education programs through several methods.

- Municipalities or other organizations that offer stormwater education resources can ask schools to administer concept tests to students who participated in classroom stormwater education. Concept tests are short, informal tests that measure how well students understand key concepts. Students can take them before and after receiving stormwater and pollution prevention education to see if their understanding has increased (Eberly Center, n.d.).
- Schools can also survey students to learn their opinions on stormwater-based education. Did they enjoy the activities? Were the resources easy to understand? What, if anything, do they want to learn more about? These are just a few questions a survey can include.
- After receiving education on the importance of keeping stormwater pollution free, students may feel more compelled to get involved in events in their community. Municipalities can track attendance of schoolchildren at stormwater outreach events to see if participation and engagement has increased after an educational program.

If the results from these methods show that the programs have not been as effective as hoped, municipalities can alter outreach strategies and tailor their classroom approach to better fit student and school needs.

Additional Information

Additional information on related practices and the Phase II MS4 program can be found at [EPA's National Menu of Best Management Practices \(BMPs\) for Stormwater website](#)

References

California Water Boards. (n.d.). *Water Quality Detectives: After School Program*.

Eberly Center. (n.d.). *How to assess students' learning and performance*.

Disclaimer

This fact sheet is intended to be used for informational purposes only. These examples and references are not intended to be comprehensive and do not preclude the use of other technically sound practices. State or local requirements may apply.