
Score Four:

Students, Schools, Streams, and the Bay

1. Foster a generation of stewards with Meaningful Watershed Educational Experiences at your school.
 2. Engage students in real-world science, geography investigations, math, and communication skills.
 3. Address Environmental Literacy, Next Generation Science, STEM, C3 Social Studies Framework for Inquiry.
 4. Preserve waterways through student stormwater sustainable practices on your campus.
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WITH THE SCORE FOUR PROGRAM THE PROCESS IS AS IMPORTANT AS THE END GOAL. Score Four lessons culminate with student-led stormwater-reduction projects on your campus — but before one shovel of dirt is turned, students are engaged in cross-curricular hands-on inquiries about their school’s watershed and grounds.

Using scientific practices, students assess permeability, stormwater dynamics, pollution sources, and soils. Integrating their new-found knowledge with Score Four project-planning tools, they then select a location and project to reduce stormwater runoff. Their Student Stormwater Action Project (SSAP) could be a native garden, conservation landscape, tree planting, rain garden, or another sustainable option. The next steps: selecting appropriate native plants, creating project designs, and planning maintenance, all done through teamwork, class discussions, and presentations.

By the time the students turn the ground for their new project, they have ownership for it. Plus, they understand how and why their project will help their local stream. Along the way, they will have practiced scientific field methods and everyday math, improved their communication skills, and gained the ability and, hopefully, the desire to carryout stormwater pollution solutions in their communities.

FOR TEACHERS, THE SCORE FOUR PROGRAM PROVIDES a series of investigations that can be adapted to different curricula and ages. Beginning the program in the fall builds flexibility into the schedule and gives more opportunities for outdoor learning.

The lessons in this series are geared to the completion of conservation landscape; they are, however, effective in preparing other sustainable stormwater projects, such as rain gardens or

A Score Four program fulfills the requirements for a [Meaningful Watershed Educational Experience](#) (MWEE), as well as [Maryland Environmental Literacy](#) (MEL) Standards 1, 2, 3A, and 5A.

Table 1 (p. 2-3) shows how the Score Four framework dovetails with MWEEs and MEL Standard 1, Environmental Issue Investigation and Student Action.

food forest. The [Resource](#) section provides information on the development of many sustainable stormwater projects.

Table 1: Score Four Framework
In Conjunction with Maryland Environmental Literacy (EL) Standard 1 and
Meaningful Watershed Educational Experiences (MWEE)

EL Topic A: Environmental Issue Investigation (or MWEE)	Suggestions Regarding MWEE and EL requirements	LESSONS AND ACTIVITIES All Score Four lessons, presentations, and resources are at www.potomacriver.org/scorefour . Links are provided below to Teacher Lesson Plans (TLP) and Student Handouts (SH). Lessons continue to be added (TBA).
EL Indicator 1: Identify an environmental issue <i>(MWEE: Choose issue.)</i>	<i>Possible Issue:</i> How do human activities affect: <ul style="list-style-type: none"> ▪ local water pollution? ▪ local stream ecosystems? ▪ the Chesapeake Bay? ▪ our local watershed? 	SCORE FOUR SECTION A: EXPLORING YOUR WATERSHED Presentation: <ul style="list-style-type: none"> • Score Four: Watersheds, Land Use, and Sustainable Practices (PDF/PPT). Use entire presentation or just the sections on water pollution, watersheds, and land use.
EL Indicator 2: Develop and write research questions related to the environmental issue. <i>(MWEE: Create organizing and supporting questions.)</i>	<i>Students pose organizing question, such as:</i> <ul style="list-style-type: none"> ▪ How does land use in the school's watershed affect local streams? <i>Students pose supporting questions:</i> <ul style="list-style-type: none"> ▪ How does the impervious surface on our school grounds contribute to stream pollution? ▪ How much stormwater runoff is generated on our campus? ▪ What pollutants are contained in runoff from school grounds and surrounding watershed? ▪ How does surrounding land use our local stream ecosystem? 	Associated Score Four Student Inquiries: <ul style="list-style-type: none"> ▪ Topography, Landuse, and Stormwater Chemistry. Use all or parts of this 3-part inquiry. The TLP includes all sections and the presentation. <ul style="list-style-type: none"> ▪ Topography SH (upper grades) ▪ Stormwater Chemistry SH (gr. 7-12) ▪ Or FieldScope Map Inquiry (gr. 6-12). Presentation: PDF/PPT, TLP SH Other Options for Engagement and Inquiry: <ul style="list-style-type: none"> ▪ Visually assess nearby stream (ICPRB Physical Assessment lesson – TBA) ▪ Assess stream water chemistry. Presentation: PDF/PPT, TLP SH(Middle School, High School) ▪ Make and use Watershed Connections Models and Activities or other watershed models.
EL Indicator 3: Communicate the issue.	Share issue, research questions & results with other classes or community throughout the project. Don't miss the opportunity to involve other disciplines or grades.	Many possibilities for students, including: <ul style="list-style-type: none"> ▪ Post maps & research in hall. ▪ Communicate project with articles, videos, blogs. ▪ Provide presentation to other classes or parents. ▪ Share findings in Science Fair.
Indicator 4: Design and conduct the research.	<i>Hands-on Multidisciplinary Investigations:</i> Different classes can investigate different supporting questions or aspects of them. Use Score Four investigations to answer questions on permeability and stormwater paths. Definitely include Campus Assessment.	SCORE FOUR SECTION B: ASSESSING YOUR CAMPUS <ul style="list-style-type: none"> ▪ Permeability Prediction (gr. 5-8), optional. TLP SH ▪ Permeability Field Investigation (gr. 6-12), optional. TLP SH ▪ Campus Assessment. Presentation: PDF/PPT, TLP SH ▪ Soils Lessons and Inquiries <ul style="list-style-type: none"> - Presentation: Soil Basics (Middle School: PDF/PPT, High School: PDF/PPT) - Soil Components (texture and soil identification) TLP SH - Soil Percolation Investigation TLP SH
Indicator 5: Use data and references to interpret findings.	Interpret findings recommend possible sites for a conservation landscape. Alternatively, upper-level students research stormwater solutions, present pros and cons, and recommend a project (source materials at Resources).	<ul style="list-style-type: none"> ▪ Lesson: View or review Score Four: Watersheds, Land Use, and Sustainable Practices (PDF/PPT) section on stormwater runoff solutions. ▪ Presentation: Conservation Landscapes (PDF/PPT) ▪ Class recommends solutions and possible sites.

EL Standard 1 Topic B. Action Component (or MWEE Student Action Project) The Action Component of Score Four involves student inquiries to determine the best location and attributes of their stormwater-reduction project, all leading to its implementation. NOTE: If grants or donations of materials are needed, the teacher(s) may need to determine the type of stormwater-reduction project ahead of time and make behind-the-scene preparations. Students can still be involved in the research and selection of the site, the project design, the maintenance plans, and the evaluation method.		
<p>EL Indicator 1: Develop and implement an environmental action plan.</p> <p><i>(MWEE: Plan and implement a student action project, considering alternatives in the process.)</i></p>	<p>Consider stormwater solutions and conduct research to select solution. Solutions can involve conservation landscapes, rain gardens, riparian buffers, and more. The adjacent Score Four lessons are geared to conservation landscapes, but can be adapted to all these efforts.</p> <p>Score Four investigations provide answers that help students determine the most appropriate stormwater solution and site location. Students can determine additional questions to be answered.</p> <p>Before taking on a project, teachers and students should determine how it will be evaluated and maintained. (Indicator 3.)</p>	<p>SCORE FOUR SECTION C: PLANNING YOUR PROJECT</p> <p>This section covers the identification of project goals through investigations and student decision-making processes. It includes plant selection and project design and implementation for their SSAP.</p> <p>Score Four presentations:</p> <ul style="list-style-type: none"> ▪ Conservation Landscapes (PDF/PPT) ▪ <i>or</i> Conservation Gardens: Why They Are Needed Plus Planning & Planting Tips (this presentation can be broken into sections) TBA <p>Perform the following inquiries to determine the best solution:</p> <ul style="list-style-type: none"> ▪ Sun/shade Observation SH ▪ Project Goals. This activity guides student selection of secondary goals for their action project. SH ▪ Site Selection. This activity guides student selection of a site for their SSAP. SH ▪ Site Conditions and Project Characteristics for conservation landscapes, trees, food forests. Raingarden plants have different requirements. SH ▪ Plant Selection and Garden Design. Use for conservation landscapes, tree plantings, food forests. <ul style="list-style-type: none"> - Presentation: Native Plants and Plant Selection (PDF/PPT) - Presentation: Garden Design (PDF/PPT) - Plant Selection and Garden Design SH - Planning Color for the Seasons SH ▪ For food forests, rain gardens, and tree plantings, see Resources for specific guidance. ▪ If doing a rain garden, see Site Assessment for Rain Gardens for instructions on Percolation Test and Slope determination (TBA) <p>Other project planning factors: Is it practical for the class to develop within the timeframe and budget? What help could be obtained and how? What tools and supplies are needed? How to organize the work day? Can the project be maintained?</p> <ul style="list-style-type: none"> ▪ Presentation: Maintenance (PDF/PPT) ▪ Maintenance Agreement for Schools TLP ▪ Maintaining Your Project SH
<p>EL Indicator 2: Communicate, evaluate and justify views</p>	<p>Indicator 1 and Indicator 2 loop until the action project is picked, implementation plans are finalized, and project is implemented.</p>	<p>Students share results of their investigations and select project with teacher guidance and feedback.</p>
<p>EL Indicator 3. Analyze effectiveness of action</p> <p><i>(MWEE: Evaluate the project.)</i></p>	<p>Before implementation, pick evaluation methods that will show whether the project's goal(s) are met.</p> <p>Consider setting up long-term projects that can provide future research projects for students.</p>	<p>Have student design evaluations that consider <i>pre- and post-</i>student attitudes and knowledge, as well as environmental data, such as: stormwater chemistry from the site, soil porosity, soil biological activity, soil chemistry, stormwater quantity.</p>