Designing a Restoration

Activity Overview
Students create a restoration landscape plan for their school grounds.

Objectives
Students will:

- Create a landscape plan based on the site analysis of the school grounds
- Problem solve to determine the best design choices based on goals, use, function, aesthetics, and the ecology of the site
- Work cooperatively as a team
- Outline reasons why their design is appropriate for the site

Subjects Covered
Science, Math, Language Arts, and Art

Grades
3 through 12

Activity Time
Preparation – 1 hour

Planning time - 1- 2 hours (individual time)

Season
Any

Materials
Map of restoration site or school grounds, rulers, pencils, native plant information resources

State Standards
Language Arts:

Create or produce writing (B.4.1, 8.1, 12.1)

Orally communicate (C.4.1, 8.1, 12.1)

Math:

Use reasoning abilities and logic (A.4.1, 8.1,12.1)

Science:

Present a scientific solution to a problem (H.8.2)

Background
Designing a school landscape with native plants is a process with exact steps that in the end will meet the goals and needs of the people involved, will fit the existing site conditions, and create a special place for people to experience the natural world.

In a native landscape plants take on their natural forms, change through the seasons and from year to year. Native plants assembled in natural communities ecologically belong together and enhance the aesthetic appreciation of the people designing the landscape.

The first step in preparing a design involves measuring and mapping your space. See Earth Partnership for Schools activity, "Mapping Your School-yard," to learn how to map your site and draw your measurements to scale on graft paper. The second step involves conducting a site analysis to help you understand the existing conditions of your site such as soils, slopes, location of underground wires, views to screen or highlight, etc. The data collected from the site analysis will give you the information needed to make informed landscape design decisions. See Earth Partnership for Schools activity "Conducting a Site Analysis," to learn how to conduct a site analysis.

After you create a map and compile the site information you can begin the design process. To start, generate design criteria such as the goals and objectives for your site. Possible ideas and considerations may include:

- restoring ecological representations of plant communities native to the local region
- attracting wildlife such as butterflies, songbirds, and amphibians
- keeping rainwater on school property by adding rain gardens and swales to naturally infiltrate water into the soil to improve water quality and recharge groundwater
- providing access for all children with a system of trails that include trails wide enough for a wheel chair
- providing seating areas for students to assemble as a large group for discussions or small spaces for solitary reflection
- increasing biodiversity on the school grounds
- providing for educational opportunities in a natural area
- including a diversity of plants for student learning
- creating a school entrance that welcomes students and visitors
- establishing an interpretive trail or signage
- providing seasonal interest and change with a variety of flowers, fruits, vegetation colors and textures
- strategizing how the area will look from different perspectives such as from inside the school

Investigate a resource management plan or proposal (H.12.5)

Evaluate data and information sources (H.12.6)

Use scientific knowledge & reasoning (H.12.7)

Art:

Look at nature and art as visual resource (C.4.5)

Analyze nature & use art as visual resource (C.12.5)

Study patterns & color in nature (H.4.1)

Interpret complex patterns & forms by drawing (H.12.1)

- planting native species in areas that are difficult to maintain such as a low area that is intermittently wet or a steep slope
- replacing hard, impervious surfaces with porous, pervious surfaces such as removing little used paved areas with porous pavement or loosening compacted soil
- locating a restoration area that is convenient to visit so students may experience it on their own out side of the formal classroom
- designing theme gardens such as ethno-botanical gardens, sensory gardens, butterfly or bird gardens, shady (woodland), or prairie gardens

Next, draw your design ideas and possible landscape arrangements on transparent paper overlaying your base map or directly on a map. Feel free to try out ideas—there are many options for a landscape plan and there is no perfect design. Do give each area a definite shape with boundaries. These boundary lines define your landscape. Try different arrangements using the design principles below.

Space: A landscape design creates space in the form of outdoor rooms. The ceiling can be either open or closed by a tree canopy or nearby structure. Forests provide canopied spaces, savannas offer semi-canopies, and prairies present an open ceiling or no canopy.
Tree trunks, shrubs, tall herbaceous plants, or vines on a fence define walls.
The floor is formed by the groundlayer such as low-growing herbs, vines, moss, or leaf litter. The character of the space will vary depending upon the time of year—leaf on, leaf off—and the seasonal heights of plants.
Composition: Arrange the elements of your design so that each area fits together to create an
ordered whole.
Proportion or scale: Design the size of planting beds and select plant species that are in proportion with the size of the space the heights of surrounding landscape features. Small-sized plants fit in small spaces where as large-sized plantings fit in big spaces. Oppositely, small plants in a large area look dwarfed and out of place and plants too big for an area crowd the space.
Balance: Balance may be symmetrical creating a more formal landscape in which one side of an area mirrors the other. An informal or natural look is achieved through an asymmetrical balance such as balancing a group of shrubs on one side of an area with a single tree on the other side.
Repetition: Arrange similar elements through a space by repeating forms, textures or curves. Repetition unifies your design.
Contrast: Contrast creates variety in the landscape. To create contrasts, place plants with big leaves next to fine textures or one bright color next to another.
Sequence: The arrangement of elements that leads you in to a certain direction.

Choosing structures and plants is the final step in the plan. See Earth Partnership for Schools activity, "Prairie Garden Species Selection" to learn how to select species appropriate for your site.

Note: This activity is set up for students to work in teams to create a landscape design. This collaborative approach is one of several options. Students may also work independently on a design plan. Often it is a challenge to choose one plan that meets the design criteria for the site. Many schools have successfully taken ideas generated from several student design plans and combined these ideas into one final plan. An advantage to this approach is that all students involved feel ownership in the design process.

Activity Description

1. Go out to the area designated for the landscape design. Walk the area to get a feel of the space and review the site analysis data.
2. Go back to the classroom and discuss what was observed or seen as unique.
3. Divide into teams of two or three. Brainstorm design criteria for the site.
4. Draw your design plan for the site. *(See background section for sample criteria.)*
5. Write a document that supports your design ideas.
6. Present your plans to the class.
7. As a group, decide what parts you like in each plan.
8. Choose a committee who will take these ideas and create a composite design plan.

Extensions

- Design a planting for a local park or an abandoned lot.
- Find a landscape that you like in your neighborhood. Explain what design elements you think are successful and why.
- Go to a natural area and look for three natural examples of design elements. Describe what you see.

Additional Resources

- Daigle, Jean-Marc, Havinga, Donna. (1996). *Restoring Nature's Place.* Ecological Outlook Consulting and Ontario Parks Association. Ontario, Canada.
- Johnson, Julie M. (2000). *Design for Learning: Values, Qualities and Processes of Enriching School Landscapes.* American Society of Landscape Architects. http://www.asla.org/latis1/LATIS-cover.htm
- Kaplan, Rachel, Kaplan, Stephen, Ryan, Robert. (1998). *With People in Mind: Design and Management of Everyday Nature.* Island Press. Washington DC.
- Wyzga, Marilyn. (1995). *Homes for Wildlife, A Planning Guide for Habitat Enhancement on School Grounds.* New Hampshire Fish and Game department. Concord, NH.

Assessments

- List three design considerations and why they are important for creating a successful landscape plan.
- Explain the benefits of using native plants in a landscape design.
- Presentations—conduct peer review of design plan presentations.