

BOSTON SCHOOLYARD INITIATIVE

Outdoor Classroom User's Guide



Photo by Ross Miller



Outdoor Classroom User's Guide

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Introduction

The BOSTON SCHOOLYARD INITIATIVE (BSI) was established in 1995 as a public-private partnership to transform the city's schoolyards into dynamic centers for recreation, learning and community life. Eighteen years later, through a combined investment of \$20 million, BSI has created safe, welcoming play spaces for schools and communities throughout Boston. We have renovated 88 schoolyards and installed over 30 outdoor classrooms at schools across the district.

The outdoor environment of the schoolyard is intrinsically exciting to children. It offers them immediate access to the world beyond the classroom — a place to test and explore what they are learning about how the world works. The scale and multi-sensory dimensions extend far beyond what is possible to provide in the classroom. The schoolyard provides a lens onto the complexity of the everyday world.

This rich and continually changing environment invites students to explore on their own, and to interact socially. It invites physical movement, and the stillness that comes with close concentration and reflection. It stimulates curiosity and questioning, and reinforces knowledge already gained. It is where many students in the city most closely encounter the natural world.

Over the years our outdoor classroom model has greatly evolved. This guide is designed to help you understand how to best use and steward your outdoor classroom. For additional information, please visit www.schoolyards.org or www.bostongreenschools.org.



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What is an Outdoor Classroom?

Many BSI schoolyard renovations have included an outdoor classroom dedicated to hands-on teaching and learning. Traditionally, outdoor classrooms were thought of as amphitheaters or a ring of stones. BSI has developed a new model that is an interactive place of discovery, providing the opportunity to engage with all curriculum areas — including science, math, language arts, social studies and art. The outdoor classroom provides a living laboratory for year-round full-class and small group instruction.

Through professional development programs and the adaptation of traditional educational materials for use in the outdoors, BSI supports the Boston Public Schools curriculum. These resources include *Science in the Schoolyard Guides* to taking BPS science kits outdoors, developed in partnership with the BPS Science Department, and *Outdoor Writers' Workshop*, developed in partnership with the BPS English Language Arts Department.

The outdoor classroom adds a whole new dimension to public education. In our urbanized society, the outdoor classroom is a needed resource that helps bring the natural world into student's daily lives.

Teaching and learning are served best when an outdoor classroom is uniquely designed for the needs of a particular school. Details of material and form will vary with location. The following pages describe the basic components of a BSI outdoor classroom.

SUPPORTING DIFFERENT LEARNING STYLES

"The outdoor classroom has a powerful impact on students of all learning abilities. There is a worry that if kids come out of the element of a traditional classroom they won't be focused. If you give kids a clear objective of what you want them to do, you are going to see incredible learning taking place outdoors."

Erica Herman,
Elementary School Principal

Components of an Outdoor Classroom:

AREAS & IDENTIFYING FEATURES

- Gate and perimeter fence – safely defines the place
- Gathering area – seating for a full class
- Individual & small group seating – logs, stone or wood
- Pathways – primary and secondary circulation
- Urban meadow – native grasses and wildflowers
- Sample woodland – trees, shrubs and herbaceous plants
- Lab area – work tables and storage
- Landscape forms – a small hill, berm, or rain garden
- Armature – structure to support teaching tools

ELEMENTS & TEACHING TOOLS

- Natural materials to investigate – pebbles, sand, soil
- Scientific tools – wind instruments, thermometers, rain gauges, rulers, sundials, levels, pulleys, etc.
- Animal habitat – fallen logs and flat stones
- Signage – site map, plant ID labels, student displays
- Planting beds – edible & experimental gardens
- Writing surface – chalk board or white board
- Work surfaces – tables, rocks, stumps
- Compost bin & leaf cage
- Water source

Designing for Maintenance and Sustainability

Actively used outdoor spaces require maintenance — just as indoor spaces do. Planning for maintenance is essential at the beginning of the design process. Some daily tasks can be taken on by students as part of the educational process and become a way to learn about stewardship. Other maintenance resources include baseline maintenance by the custodian, seasonal landscape maintenance by the BPS schoolyard crew, the schoolyard friends group, volunteers, and trained summer youth work crews.

Proper selection of building and plant materials is critical. Materials must meet multiple criteria: high educational value, low maintenance, suitability for the site, and sustainability.

“Imagine a classroom with the sky for a ceiling and the earth as a floor. This classroom without walls is bustling with activity as young scientists explore the world of bugs and leaves, mathematicians measure rainfall, count seeds and graph their garden’s growth, dramatists rehearse their play on a windy stage, artists sketch shadows and light, and linguists name the landscape with a thousand words. The schoolyard is just a hop, skip, and jump away.”

Kirk Meyer, *Founding Director, BSI*

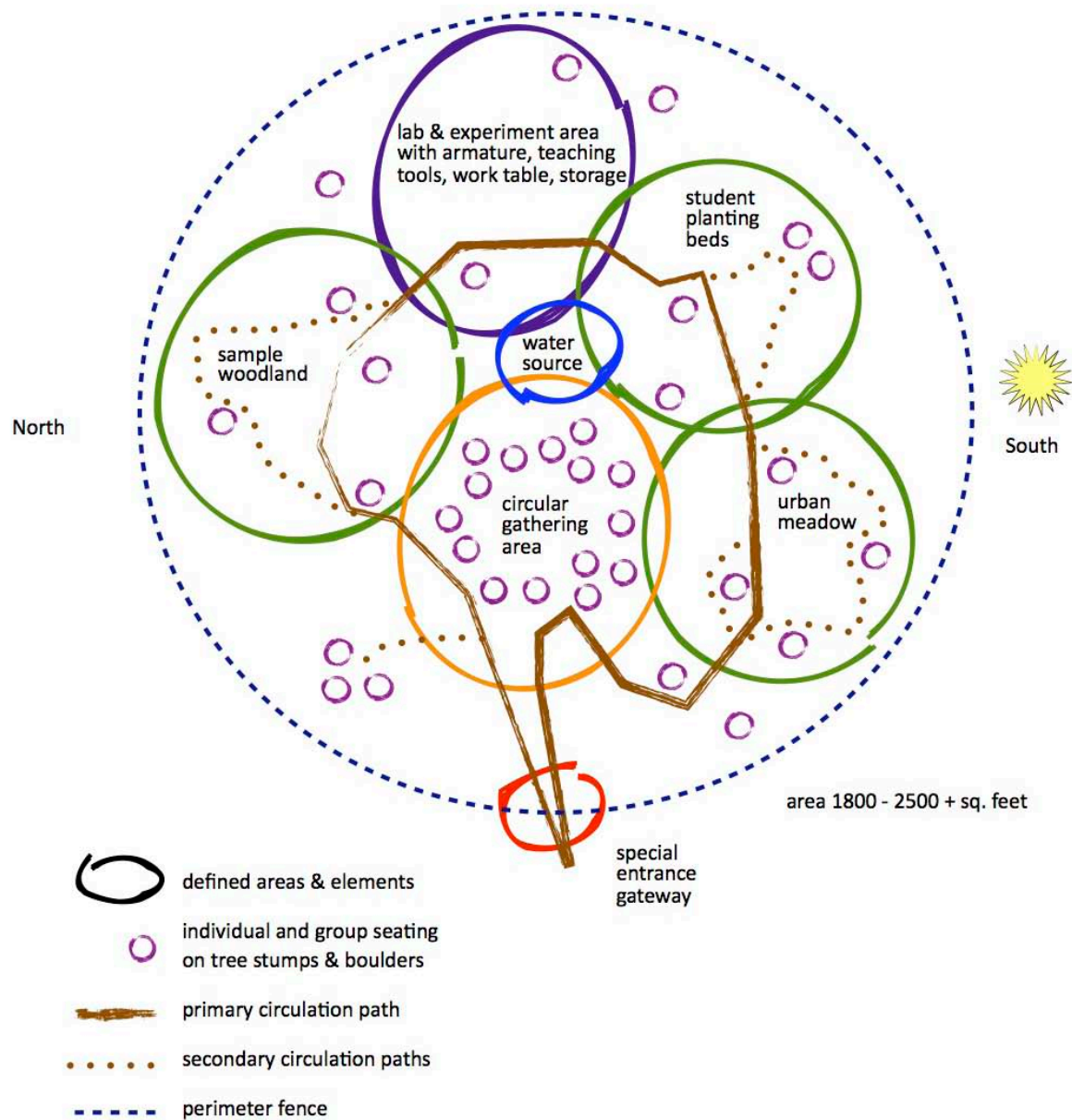


Students enter outdoor classroom through a seedpod shaped gateway, carrying clipboards to make notes for outdoor science.



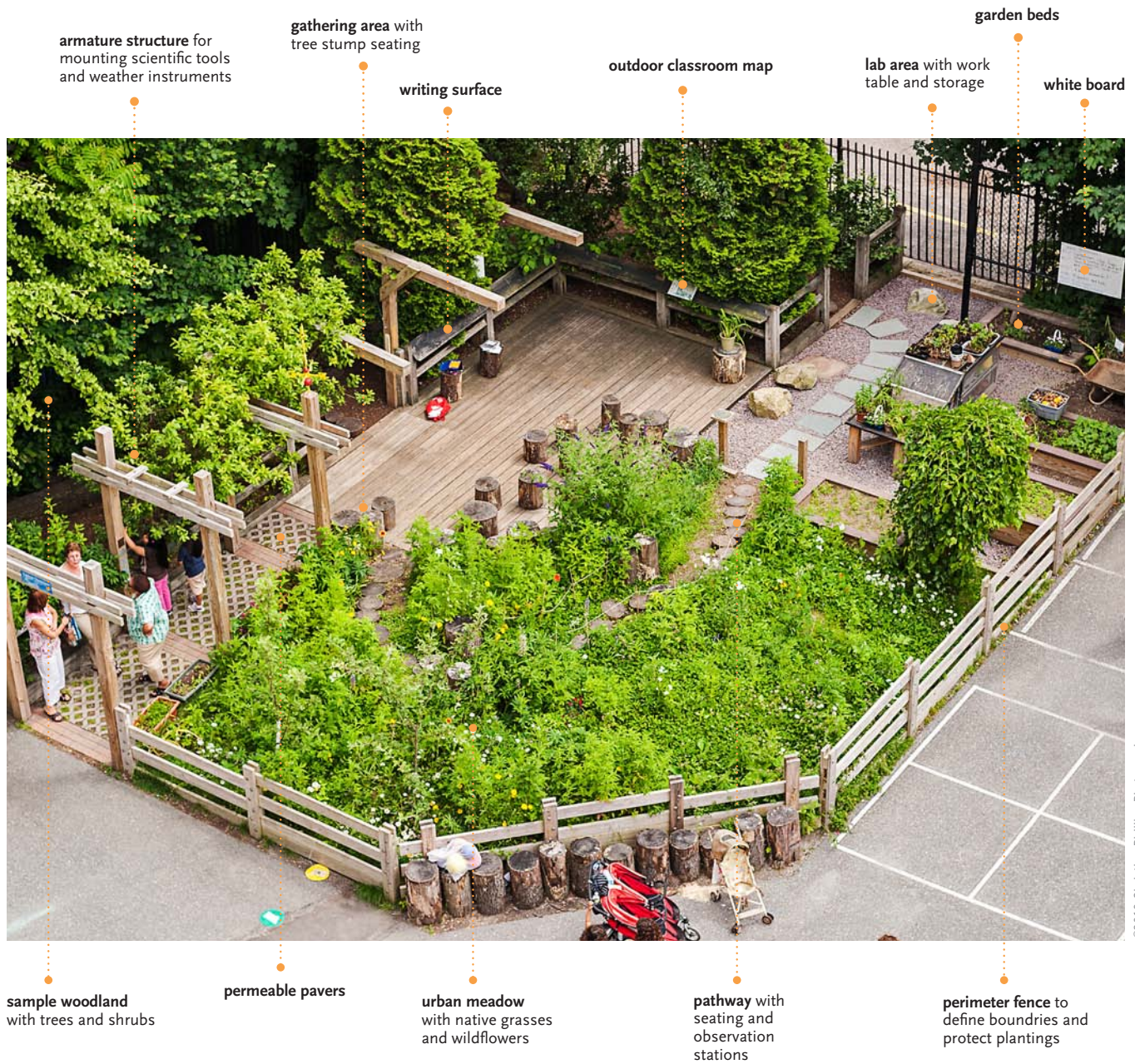
Photos by Ross Miller

Urban Outdoor Classroom — Conceptual Layout



Design by Ross Miller

Urban Outdoor Classroom — Example



Increasing the Biodiversity of your Schoolyard

Your schoolyard may be largely asphalt and concrete but life occurs everywhere if you give it a chance. All living things need food, water, and shelter. If you provide these, living things will come!

Recognize what you already have.

Look in the pile of leaves that have blown into a corner of your schoolyard, look in a crack in the concrete. These are places that provide living things with what they need.

Bring in new soil.

If you have no soil on your schoolyard, build raised beds and fill them with compost and soil. If you do have soil in your schoolyard that is hard packed and lifeless, add compost and soil and instruct children to stay off it. The compost and soil provide food, water, and shelter for worms, isopods, ants, fungi, and plants. Once those things move in, living things that depend on *them* for food, water and shelter will move in, creating a complex web of living things living in your schoolyard.

Leave some areas undisturbed.

It is important for students to see that living things carry on, even in the city, without human assistance.

Encourage decomposition.

To keep a web of life flourishing, you need to allow for decomposition. Let the fall leaves remain on the soil over the winter. This gives the worms and other decomposers something to eat, which in turn provides food for everything else. Let the custodian and principal know you want the leaves to remain. Add extra leaves, newspaper, or straw as a winter cover for the raised beds. When plants die for the winter, dig them into the ground or put them into a compost bin or pile, to incorporate into the raised bed.

Provide shelter.

Bring in an old log; some rocks, or paving stones and place them on top of soil. Along with the leaves, these objects provide living things a moist, safe place away from the burning sun and hungry predators. At the simplest level, create mini shelters using paper clips to hold one or two leaves on a branch in a curled position, or leave out rolled paper.

Create a vegetable, herb, or flower garden.

Plant a garden in the raised beds or improved ground soil. Consider carefully, especially with a vegetable garden, the timing of the school year. Unless you have a summer program that is actively involved, select plants that bloom or mature in spring and fall.

Teach students to protect these areas.

It is important to teach students that soil and everything on it is a home and should be respected. If they lift up a rock to look at what's under it, they should put it back where they found it. If they don't, all the living things they've disturbed will find another, safer place to live.

Be patient.

A schoolyard habitat can take a couple of years to get established. But even areas completely surrounded by blacktop can become filled with living things if food, shelter and water are provided.

Tips and Tricks for Outdoor Classroom Management

The following tips for classroom management come from Boston public school teachers experienced in using the schoolyard as a resource for teaching. Use these tips to help you get started taking students outdoors.



DEVELOP OUTDOOR CLASSROOM ROUTINES

Develop outdoor classroom rules to post in the classroom. (No running. Quiet voices. Touch gently.)

Establish set procedures for going outdoors.

Practice collecting clipboards and other tools, lining up, and walking through the halls so students know what is expected and can get ready quickly and quietly.

Use a different door than students use at recess.

Using a different door can reinforce the fact that this is class time and help students remember to exhibit the behavior of scientists, writers, artists, or researchers.

Have an outdoor “gathering spot.”

Designate a gathering area where students go when they first get outside to await initial instructions, and to which they return for a mid-lesson check-in or closing discussion.

Have a signal for emergency situations.

Practice it so students know how to return to the building immediately, if needed.

BE PREPARED

Have a clear objective for going outdoors.

Being clear about the purpose of going outdoors will help you direct students' attention to what you want them to observe or experience in their time outdoors, and will help students connect what they see and do outdoors to what they are learning in class.

Have a backup lesson plan.

The first several times out students will be learning how to work outdoors and the work they are doing may be secondary. Have an alternative lesson planned in case outdoor classroom rules aren't followed and you have to go back in.

Anticipate the weather.

Going outdoors is useful in all types of weather though you will likely spend less time outdoors if it is cold or rainy. Let students know you will be going out the day before and ask them to bring appropriate clothing. As they become used to working outdoors they are increasingly motivated to come prepared. Some schools keep a box of donated gloves, hats and jackets on hand.

BUILD SUCCESS

Help student get to know their schoolyard.

Use the first couple of times out to let students explore their schoolyard. Take a walk around the site and talk with them about what you find. Find out what questions they have about the things they see. Map the schoolyard and/or give names to the areas they find ("the big rock"; "the forest"). Point out any noxious plants (poison ivy, stinging nettle) that they will need to be able to identify. Let students poke around, freely explore and play with the natural outdoor materials before getting down to work.

Keep it short.

Begin with short trips out and increase the time spent outside as students' skills and stamina increase. An outdoor experience may be only ten or twenty minutes, just long enough to make notes in a writer's notebook, or to collect data; later in the year your time outdoors may be longer, but it does not need to be.

Always give students something to carry.

Clipboards, notebooks, measuring instruments, or other tools help students take their task seriously.

Go out often.

The more you go out, the easier it gets. Students' ability to work purposefully outdoors increases as they learn what to expect, experience the comfort of a routine, and develop confidence in their own outdoor observation skills.

Model outdoor skills.

Model what you want students to do before setting them loose to work. Show them how to turn over a stone gently and replace it; how to examine a plant; how to sit quietly and write; how to observe without being heard. They will learn a lot about how to look closely and take notes by watching you do it alongside them.

Remember that learning looks different outdoors.

Voices may be louder, and body movements larger outdoors. Excitement is likely to be high, and expressed more physically than in the classroom. Students may move around to share what they found with others. Encourage them to talk to each other about what they find.

Believe in your students.

All students from the highest achieving to the most challenged can work outdoors. Resist the temptation to use outdoor work as a reward for good behavior. Communicate a belief that working outdoors is simply part of everyday class work. Your students may well surprise you.

Structuring an Outdoor Science Lesson

BEFORE GOING OUTDOORS

Set up the question.

Clearly define the purpose of going outdoors and the question students will be investigating. Make sure students understand how the question connects to what they have been doing in class.

Give students a clear task.

Give students a concrete task to help focus their observations, and their thinking. They should know what they are expected to have completed by the end of their time outdoors and where and how they should record their findings. If they will be investigating something they have looked at before (characteristics of water, plant structure) be clear about the focus of today's observations.

Ask students to predict what they will find.

Ask students what they already know that could help them with their investigation. Where will they look and why? What characteristics or behavior do they expect to find?



OUTDOORS

Model what you want students to do.

Once outside, demonstrate what you are asking students to do. Show them how to look at buds, or seeds, without damaging the plant; how to lift a stone gently to look for organisms in the soil; where and how to look for stones, or signs of erosion. Ask questions that model the kinds of questions you want them to ask themselves as they investigate.

Check-in with students after a few minutes.

Bring students back together after a few minutes of independent exploration to help students interpret what they are, or are not, finding. Ask a couple of students to share what they found, and where. Try looking at one example together before sending students back out to continue their investigations. If no one has found what they were looking for (a snail, signs of erosion, etc.) talk about it. Are they sure it's not to be found? How do they know? Help students understand that not finding something can provide as much information as finding it.

Give students time to explore.

Let students experiment with, and—even playfully—explore the phenomena they are investigating. For many students the experience of being outdoors itself will be new and unfamiliar. They may never have dug in the dirt before or seen a worm up close.

Take notes outdoors.

Allow time outside for students to record their observations in their notebooks using words, pictures, numbers, and questions, to capture their “field experience.”

Reconvene at your gathering spot.

Have students reassemble before heading back to class. Ask them to help scan the area to make sure no tools or litter are being left behind and that anything that has been disturbed, like an overturned rock, is replaced.



BACK IN THE CLASSROOM

Link the outdoor experience to class content.

Discuss what students found outdoors and how it confirms or challenges what they have been learning in class.

Encourage students to take their questions seriously.

Students' questions about what they find outdoors can be used to direct future investigations that involve the whole class. (Will the bud turn into a leaf or a flower? Will the tree lose its leaves?) It may take some time — weeks, or even months — to find an answer. Help them decide which questions they might answer by revisiting the schoolyard. Could some be answered by their classroom investigations? Are there books or online resources that could help them find an answer?

Display outdoor findings to refer to later in the unit or in the year.

Preserve some of the information you collect from outdoors to compare with the results of in-class investigations. Record class data (air temperature, insect sightings) on a chart to analyze over time; begin a classroom collection of stones, seeds, or soil samples; temporarily house schoolyard organisms in a classroom terrarium; or display students' field notes and drawings.

Schoolyard Stewardship

Seasonal Activities

SPRING / MARCH-MAY

Trim back urban meadow plants in late March/April before new growth emerges. Compost.

Watch for new growth. Record emergence of shoots in OC log book. Watch for tulips.

Identify and pull weeds when they first start growing — most easily done at this time of year, while soil is moist and roots are short, and before they make seeds.

Plan and prepare student planting beds, mixing in one to three inches of compost from bin. Return uncomposted stalks back to compost for another cycle.

SUMMER / JUNE-AUGUST

Record observations at the end of the school year through sketches and writing. Add to OC log book.

Mulch planting beds with compost or bark mulch to nurture soil, conserve water, and control weeds.

Mulch walking areas and tree beds with large size wood chips, to reduce weeds and provide food for worms and bugs.

Vegetable planting and tending in designated area by summer school program. Establish an as-needed watering schedule with parents and neighbors.

FALL / SEPTEMBER-NOVEMBER

Record observations at beginning of the school year through sketches and writing. Begin fall OC log book.

Pull new weeds in beds when ground is moist and before they develop deep roots.

Clear unwanted growth and compost it for spring. Keep compost pile as moist as a wrung-out sponge. Check compost pile temperature.

Mulch planting beds with leaves or compost to reduce winter weeds and feed the soil. Prepare new planting beds by mixing in compost; top dress with bark mulch.

Prepare for spring bulbs: Order in September. Plant in October and early November. Select tulips for Journey North Project or early spring bulbs such as crocus and narcissus.

WINTER / DECEMBER-FEBRUARY

Tuck in garden beds for winter rake winter leaf mulch back onto beds if winds blow it off. Remove any remaining weeds to prevent them from going to seed.

Remove blown trash and rake gravel as needed.

Observe and document winter conditions and changes with sketches and writing. Add to log book and display.

Prune woody trees and shrubs when dormant between December and February.



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What to do With all of Those Leaves?

A **leaf cage** is a wire container for leaves collected from fall and spring clean-ups.

Uses of the leaf cage: To make leaf compost (called leaf mold); to observe decomposition; to find isopods, worms and insects; to measure, collect data, and observe changes over time; to use for improving soil and holding moisture in planting beds; to use as mulch in the woodland area to hold down weeds.

Introduction to composting: Rake leaves and place inside wire cage. Measure height, note moisture levels, record color and condition of leaves. Add weeds from planting beds and pathways (no stems, woody sticks, paper, or trash). Do not add weeds that have formed seeds - they may promote more weeds in the future.

Maintaining the leaf cage: Remove all trash. Add leaves from fall and spring clean ups, and throughout the growing season. If there are extra schoolyard leaves to manage in the fall use paper leaf bags and work with the school department to arrange pick-up.

Using the leaf mold: Every spring after a year of active composting remove the decomposed leaves (a brown crumbling soil-like mass). There may be remaining leaf material after one year, as it takes 2 years for leaves to break down beyond recognition. They will continue to break down as mulch. Composted leaves are acidic and as they continue to break down they use up nitrogen — if added to planting beds, additional fertilizer may be needed to grow vegetables.



Any deciduous leaves can be used, a variety is even better.



Rake leaves to fill the leaf cage.



A measuring stick records the changing height of the leaf pile during the process.



Leaf mold keeps decomposing through the winter and into spring.



Turn and stir the leaf mixture to help the breakdown.



One or two years later, leaf mold is ready to spread on garden beds. In dry conditions it may take several years to create leaf mold that is as dark and rich as shown.

Weeds in the Outdoor Classroom

Weeds happen. Once an outdoor classroom landscape is created, it starts to provide a fertile living habitat. It is easy for weeds to be introduced by the wind and by birds. Seeds can even be tracked in on people's feet.

Our definition of a weed is culturally determined: it's any plant that we feel is out of place. Weeds often are robust plants, able to establish themselves in poor soil, with irregular water and sun conditions.

In the outdoor classroom we remove certain weeds to reduce competition and allow a diversity of plants that have specific educational uses to flourish. Weeding also keeps the foot pathways and work areas clear and inviting.

If weeds are removed on an ongoing basis, the process is easy. It is best to remove weeds before the seeds mature. Remove weeds from all pathways and gathering and work areas.

If weeding is neglected for months at a time, weeds will become more permanent inhabitants of the outdoor classroom as they disperse their seeds and spread their roots underground.

Please note: some plants that look like "weeds" in the urban meadow area are intentionally planted or left to grow as habitat; for this reason the urban meadow is normally not weeded except by the BSI horticulture staff. It is ok, however, to weed the pathways going through the meadow.

HOW TO REMOVE WEEDS

- Pull weeds out by hand (be careful to remove all of the roots) and place them in the leaf cage to decompose and make new soil.
- When weeds are removed on an ongoing basis, the process becomes easier year after year.
- It is important to remove weeds before their seeds mature, disperse, and make more weeds!

Involving students in outdoor classroom stewardship can be very rewarding, although teaching them to differentiate between weeds and plants that should be left alone can be challenging. Some teachers have each grade learn to identify a single weed which they are responsible for pulling out wherever they see it. Also consider giving each grade their own outdoor classroom task: for example, one grade weeds the pathway, another weeds along the fence, another picks up trash, etc.



Weeds ready to be removed in cracks between pavers in a gathering area.



Weeds encroaching on a designate pathways - these weeds look small in May or June, yet can take over a site, and completely hide a pathway, if left alone until September.



Bulb Planting

Late fall is the time to prepare for spring by planting bulbs. Planting can take place as long as the ground is not frozen.

In March and April, a month before most other plants flower, the bulb's leaves and flower buds push out of the earth. A few weeks later blossoms are ready to discover and observe.

Once planted, bulbs multiply and will bloom year after year. Plant bulbs in protected schoolyard and outdoor classroom areas. Bulbs are well suited for under trees, along edges of buildings, or in the outdoor classroom woodland or meadow. Planting beds are not the ideal place for bulbs, because they are specially built for annual experimental plantings and vegetables. Bulbs planted in the raised planting beds may conflict with these other student uses.

Bulbs are available from local garden centers, hardware stores, and many mail order catalogues.

TYPES OF BULBS

Crocus — small blossoms in very early spring

Narcissus (daffodil) — early bloom, will be 10"-12" tall

Hyacinths — wonderful fragrance in spring

Alliums — late spring bloom, dramatic 40" high flower heads

Tulips — large blossom, spring bloom

EDUCATIONAL OPPORTUNITIES

Journey North Project — engaging class program to participate with other schools and observe bulbs as a tool to chart seasonal change across the country.

Student project ideas:

www.learner.org/jnorth/tulip/index.html

Bulb planting tips:

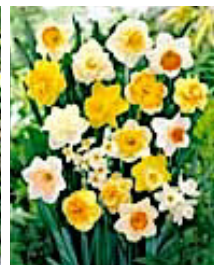
www.learner.org/jnorth/tm/tulips/Planting.html



Outdoor writing - observing tulips and daffodils.



Crocus



Narcissus



Alliums

Maintenance Requests & New Gardens

To request repairs or maintenance support with your outdoor classroom, please contact the Boston Public Schools Facilities Department by emailing schoolyards@bostonpublicschools.org. Additional contact information for the department is listed below.

CONTACT	TITLE	E-MAIL	PHONE #
Sebastian Downs	Green Schools Volunteer Coordinator	sdowns@bostonpublicschools.org	(617) 635-9651
Phoebe Beierle	Sustainability Manager	pbeierle@bostonpublicschools.org	(617) 635-9138
Khadijah Brown	Director of Facilities	kjbrown@bostonpublicschools.org	
Susan Cascino	Recycling Director, DPW	susan.cascino@cityofboston.gov	(617) 635-3142
Neil McCarthy	Landscape Management Consultant	nmcchort@aol.com	(978) 580-1759
John McIntosh	Materials Distribution	jmcintosh@bostonpublicschools.org	(617) 635-8745
Eli Semaan	Exterior Grounds Supervisor	esemaan@bostonpublicschools.org	(617) 635-8300
Campbell Center			(617) 635-8300
Court Street			(617) 635-9162

A tool request form can be submitted to John McIntosh to borrow these tools for volunteer projects:

- Flat shovels
- Garden rakes
- Leaf rakes
- Leaf bags
- Push brooms
- Gloves

www.bostongreenschools.org/wp-content/uploads/2013/12/Tool-Request-Form.pdf

The Facilities Grounds Crew will pick up yard waste on request. Yard waste must be in paper leaf bags, and sticks must be tied into 3-ft bundles. Contact John McIntosh one week in advance to schedule a yard waste pick up. Yard waste collected during peak times (i.e. spring and fall leaf raking) will be picked up by an outside vendor. During peak times, please contact your custodian to coordinate leaf pickups.



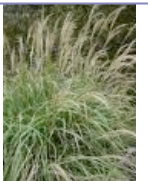






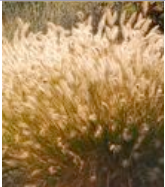














Any new garden beds built by the school must be approved by the BPS Facilities Department and should comply with their guidelines: www.bostongreenschools.org/gardenspecs

Schools putting in new gardens can request these materials from Eli Semaan, two weeks in advance:






















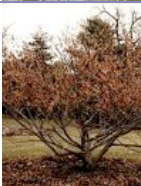


- Soil, up to 3 yards
- Mulch, up to 4 yards
- Stone dust

Additionally, the Boston Public Works Department supports gardening across Boston by providing compost to school sites free of charge. This compost is pre-tested and a suitable soil amendment for vegetable gardens, but should not be used as the sole growing media. To place an order for delivery, please contact Susan Cascino, Recycling Director at DPW. Please specify the quantity of compost requested (5 or 10 yards) and the location for delivery.





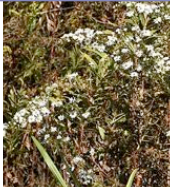











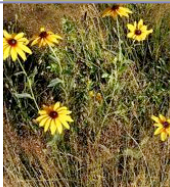







Schoolyard and Outdoor Classroom Plants

Latin Name Common Name	Fall	Winter	Spring	Special Characteristics	Learning Opportunities and Horticultural Value
GRASSES					
Miscanthus Sinensis Eulia grass/ Maiden grass					Dramatic growth during school year, prominent monocot seed heads, 3'-5' tall; large feathery seed heads and stems all winter.
Panicum viratum Switch grass					Golden brown stems through winter.
Pennisetum alopecuroides Fountain grass					Large seed heads late fall; Seed heads good for collection.
Schizacharium scoparium Little Bluestem					Also called bunch grass; blue green stems; slender stalks shed snow in winter; good for observing color change.
SEDUMS					
Sedum Autum Joy					Blooms into late fall; flower heads change color from pale pink to deep rose.
Sedum Hens and Chicks					Low to the ground; easy to grow and divide to make more; succulent leaves retain water.

























Schoolyard and Outdoor Classroom Plants

Latin Name Common Name	Fall	Winter	Spring	Special Characteristics	Learning Opportunities and Horticultural Value
SAMPLE WOODLAND					
<i>Acer griseum</i> Paperback Maple					Dramatic exfoliating bark; leaves bright red/orange in fall; holds leaves into winter.
<i>Koelreuteria paniculata</i> Panicked Golden Rain Tree					Large Chinese lantern-like seed pods that remain in winter; good for collecting seed pods and counting seeds.
<i>Ilex opaca</i> American Holly					Need male to pollinate for fruit on female.
<i>Pieris</i> Brouwer's Beauty Andromeda					Broad leaf evergreen shrub; mini blossoms along upper stems in April.
<i>Hamamelis virginiana</i> L. American Witchhazel					Fragrant blooms in October/November; retains flowering heads into winter.
<i>Hamamelis vernalis</i> Witchhazel					Yellow to red flowers appear in very early spring and last up to four weeks.

Schoolyard and Outdoor Classroom Plants

Latin Name Common Name	Fall	Winter	Spring	Special Characteristics	Learning Opportunities and Horticultural Value
URBAN MEADOW					
<p><i>Asclepias syriaca</i> Milkweed</p>					Silky white hairs on flat seeds allows wind to easily disperse seeds when pods open in fall.
<p><i>Aster pilosus</i> Aster White Heath</p>					Flowers August to November; look for tiny hairs on stems; found in dry areas and roadsides.
<p><i>Echinacea purpurea</i> Purple Coneflower</p>					Late bloom; holds flower heads into fall; food source for butterflies.
<p><i>Daucus carota</i> Queen Anne's Lace</p>					"Wild carrot"-smells like carrots when you scratch the root; purple/white early flowers; will pull color into flower when cut and placed in colored water.
<p><i>Rudbeckia hirta</i> Black-eyed Susan</p>					Blooms late summer into fall; next year's plants come from self-sown seeds.
<p><i>Arctium minus</i> Burdock (Thistle)</p>					Biennial plant (takes two years to complete its seed forming life-cycle; needs a dormant over winter phase; velcro-like seed pods.

Schoolyard and Outdoor Classroom Plants

Latin Name Common Name	Fall	Winter	Spring	Special Characteristics	Learning Opportunities and Horticultural Value
SCHOOLYARD TREES					
Pinus strobus 'fastigiata' Eastern White Pine					Large cones; distinct needles in cluster of five; used for ship's masts in colonial times.
Ginkgo biloba Ginkgo					Durable and slow growing; many variations in fan shape leaves; ancient tree from China.
Quercus palustris Pin Oak					Acorns to collect; fall color; dry leaves often remain through winter.
Cornus kousa Kousa Dogwood					Blooms in June; fruit stays into late fall.
Gleditsia triacanthos Common Honey Locust					Curly legume seed pods through winter; dramatic thorn clusters; small multiple leaves on stems.
Tilia cordata Linden					Scented blossoms in spring; heart shape leaves; multi-color fall leaves.

Plant List Rationale

The BSI schoolyard plant list was developed with input from Peter Del Tredici, Director of Living Collections at Harvard's Arnold Arboretum; Roy Blomquist, former chief Horticulturalist for the City of Boston Department of Parks & Recreation; Neil McCarthy, Boston Public Schools Horticultural Consultant for the Boston Schoolyard Initiative; BSI landscape architects; BPS principals and teachers; and BSI staff. The plants on the list have been selected for schoolyards and outdoor classrooms based on the following criteria:

Educational value /connection to curriculum: A common set of plants across schoolyards and outdoor classrooms enables BSI staff and teachers to develop instructional guides and plant ID documents to help teachers maximize the educational use of the outdoors.

Horticultural diversity/habitat support/seasonal interest: In the schoolyard and the outdoor classroom it is important to choose plants that display primary seasonal interest during the regular school year. The BSI plant list offers choices to stimulate curiosity by presenting a wide range of plant characteristics — structure and form, seed dispersal mechanism and flower types, growth habit, color, texture, smell, role in providing habitat, and value as a food source.

Maintenance/sustainability: A common plant palate for all schoolyards facilitates effective schoolyard maintenance. BSI develops plant identification tools and plant maintenance training for BPS maintenance crews and youth teams. Efficient seasonal maintenance is dependent on a common set of identifiable plants.

The outdoor classroom **urban meadow**, contains only herbaceous meadow plants, as the meadow maintenance plan is to mow everything down to the ground in late winter prior to the new growing season. By contrast the **sample woodland** contains perennial shrubs and understory trees and ferns, and is selectively weeded and mulched.

Schoolyards and outdoor classrooms are heavily used public spaces. To ensure viability of border plants and schoolyard trees the planting plan must be detailed with protective fences, guards, or within raised planting beds, to protect plants both at initial installation and during their full life cycle. Ground covers are to be specified only with careful consideration of site usage, and with proper plant protection.

Long term sustainability of the investment in schoolyards and outdoor classrooms is the result of thoughtful design, plant placement and soil specification, attentive construction oversight, and consideration for the realities of schoolyard maintenance.

Additional Resources

PLANTS

The Boston Schoolyard Initiative has compiled a list of recommended plants for schoolyards and outdoor classrooms: www.schoolyards.org/pdf/BSI%20SY+OC%20plant%20list%202011-1.pdf.

Invasive species are not permitted in school gardens; Mass Audubon has compiled a list of invasive species: www.massaudubon.org/Invasive_Species/plants.php

Fruits and vegetables:

www.almanac.com/gardening/planting-dates/MA/Boston

www.growmycitygreen.com/resources/what-you-can-grow

COMPOST BINS

www.cityofboston.gov/publicworks/wastereduction/composting.asp

www.cityofboston.gov/images_documents/welded%20wire%20bin_tcm3-39939.pdf.

www.woodlanddirect.com/Outdoor/Compost-Tumblers/Tumbling-Composter

www.cityofboston.gov/images_documents/vermicompostingonebin_tcm3-39940.pdf (one bin)

www.cityofboston.gov/images_documents/vermicompostingtwobin_tcm3-39941.pdf (two bin)

TOOLS

Tool requests can be submitted to BPS:

www.bostongreenschools.org/wp-content/uploads/2013/12/Tool-Request-Form.pdf

Rain barrels:

www.rainbarrelsource.com/rain-barrels/rain-barrels/upcycle48galterracottarainbarrel.cfm

GRANTS

www.bostongreenschools.org/wp-content/uploads/2013/09/Garden-Grants.pdf

LOCAL ORGANIZATIONS

Arnold Arboretum: www.arboretum.harvard.edu

Boston Cares: www.bostoncares.org/

Boston Green Schools website: www.bostongreenschools.org

Boston Natural Areas Network: www.bostonnatural.org

Boston Nature Center: www.massaudubon.org/Nature_Connection/Sanctuaries/Boston

Boston Parks & Recreation Department: www.cityofboston.gov/parks

Boston Tree Party: www.bostontreeparty.org

Boston Water and Sewer Commission: www.bwsc.org

City Sprouts: www.citysprouts.org

City Year Boston: www.cityyear.org/boston.aspx

Ecological Landscaping Association: www.ecolandscaping.org

The Food Project: www.thefoodproject.org

Massachusetts Audubon: www.massaudubon.org

MA Department of Environmental Protection Composting Program: www.mass.gov/dep/recycle/reduce/compgnt.htm

Massachusetts Horticultural Society: www.masshort.org

Mayor's Office of Neighborhood Services: www.cityofboston.gov/neighborhoods/ons.asp

New England Grassroots Environment Fund: www.grassrootsfund.org

continued on next page

New England Grows: www.negrows.org
New England Wildflower Society: www.newfs.org
UMass Cooperative Extension: www.ag.umass.edu
UMass Soil Testing Lab: www.soiltest.umass.edu

OTHER RESOURCES

American Community Gardening Association: www.communitygarden.org
Garden Fact Sheets Database: www.plantfacts.osu.edu
Garden Mosaics Project: www.communitygardennews.org/gardenmosaics/index.htm
Journey North: www.learner.org/jnorth
Kids Gardening: www.kidsgardening.org
National Gardening Association: www.garden.org
USDA Plant Database: www.plants.usda.gov

‘Nature Is a Powerful Teacher’: The Educational Value of Going Outside

At more than 80 Boston public schools, teachers are moving the classroom outdoors.

Julia Ryan | Oct 31 2013, 12:40 PM ET



Christian Phillips Photography

Four years ago, the nurse at Boston’s Young Achievers School was overwhelmed. Previously a middle school, Young Achievers had recently become a K-8 school and there was no appropriate space for recess. Instead, according to a teacher at the school, students spent recess in “a disorganized, cracked, muddy parking lot,” where they ran between and bounced balls off of cars.

That changed when a group called the Boston Schoolyard Initiative began a community planning process to build a new playground and outdoor classroom at the school. Today, students spend recess digging in a sand box, crafting tunnels through a bramble, and playing in a stream—and asphalt injuries no longer fill the nurse’s office.

Young Achievers is just one of the 88 schools the schoolyard initiative has renovated since it began bringing green space to urban schools in 1995. Through its partnership with the City of Boston, Boston Public Schools, and the Boston Schoolyard Funders Collaborative, BSI has developed, designed, and constructed outside space at every feasible elementary and K-8 Boston public school.

“Nature is a powerful teacher, and there are so many things that kids can learn hands-on in the schoolyard that they cannot learn sitting in a classroom,” Boston Schoolyard Initiative’s Executive Director Myrna Johnson said.

I talked to teachers at a handful of schools to find out how the outdoor facilities have affected everything from science curriculums to behavior management.

ELLIS MENDELL ELEMENTARY SCHOOL

When the Boston Schoolyard Initiative begins the process of creating an outdoor space, they start by talking to the community about the wants and needs of their teachers and students.

For the Mendell School, Klopfer Martin Design Group incorporated several features, like a lab workspace and planting beds, into the school playground.

The school’s science specialist Elizabeth Hadley uses the arbor with a pulley system to teach her fifth grade students about simple machines. The meadow and woodland area come into play when she covers ecosystems and food webs. Her second-grade students collect bugs under the logs and then apply lessons from their classroom to determine whether or not those bugs are insects.

The outdoor space has also become integral to Hadley’s work with a diverse student body. The outdoor space “levels the playing field,” she said, for students from different backgrounds and for students with special needs. “The amount of background knowledge and experiences of going outside and exploring nature that kids bring to the table can be drastically different...Even if they’ve never had any experience before with touching animals or looking for animals in their habitats, they are all doing it at the same time. They can all talk about it together.”

These outdoor experiences can be especially crucial for ESL students, who can use new science vocabulary in its context. “Because students internalize [new vocabulary] best when they are exposed to it in multiple ways, in different kinds of contexts, I find that the language they are using is a lot higher when they’ve had a chance to experience it in multiple settings,” she said.



Klopfer Martin Design Group

YOUNG ACHIEVERS SCIENCE AND MATH PILOT SCHOOL



Christian Phillips Photography

At the Young Achievers School, administrators had to create a space to accommodate an influx of younger students when the school went from being a 6-8 middle school to a K-8 school. Before the renovations, teachers held recess in a parking lot and struggled to encourage play while keeping the children safe. The new outdoor space was designed to encourage “nature play,” a term for informal interactions with natural materials, like logs, gardens, and trees.

The uses for Young Achievers School’s outdoor space “aren’t quite so clearly specified,” Johnson said. For example, the logs in the outdoor classroom are used as balance beams during recess and the decking is used as a stage or as a fort. Bo Hoppin, the school’s experiential education coordinator, said, “We didn’t want our outdoor classroom to be just a classroom, we also wanted it to be a place where kids could come as a recess alternative to interact with nature in a non-formal way.”



Christian Phillips Photography



Bo Hoppin

Hoppin believes that nature play “stimulates cognitive development and definitely helps with behavioral issues and challenges that we have.”

The outdoor space is also used for formal instruction. For example, in a myth, legends, and folktales unit, students read the Native American story of the Three Sisters Garden. Then they learn about the agricultural practices of Native Americans while planting a Three Sisters Garden in the outdoor classroom. The unit also ties in science instruction, when the students learn about the structures of seeds and plants.

During a unit on ancient civilizations, sixth-graders use the outdoor classroom as an archeological dig. Seventh-graders study land geology and use the rocks in the outdoor classroom to look at the chemical processes of what weathers rocks.

These kind of outdoor experiments provide “an opportunity to test the concept in a real-world setting and they get a deeper understanding of the concept than if they were doing one experiment in the classroom,” Johnson said.

Using the outdoor space has had other benefits for the students. Hoppin said teachers have noticed students are more curious about learning after using the outdoor classroom. The space has also helped students with social and emotional behavioral problems. For these students, it serves a “reset space” where they can decompress during the day, Hoppin said.

SAMUEL W. MASON ELEMENTARY SCHOOL



Klopfer Martin Design Group

The Mason School outdoor classroom is used for everything from insect gathering to watercolor painting. One teacher at the school has partnered with The Food Project to plant vegetables in the gardens and teach students about where food comes from. Jose Rosa, another teacher at Mason School, uses the outdoor classroom to show teach his students about organisms in nature.

In the fifth grade, Rosa’s students studied pill bugs in soda bottles during a unit on ecosystems. “But when they go outside...they see these pill bugs underneath logs, underneath shrubs, and they see that they actually exist outside of the classroom. So I think it’s bringing reality into the students’ world,” he said.

THOMAS A. EDISON MIDDLE SCHOOL

As an arts-focused school, the Edison School looked to create an outdoor space that could extend arts work outside of the classroom. The result includes outdoor reading spaces and an amphitheater.

“It is not uncommon to see an eighth-grade class that goes out there to... read a novel together,” Edison School Principal Mary Driscoll said. “Or to do writing they’ll go out and the assignment might be to observe something closely... and write about something they are observing.”

When nearby elementary and middle schools merged, Driscoll took the unusual step of mandating outdoor recess for her middle school students. “The research seemed pretty compelling that giving students even just ten minutes of outdoor time has a positive impact on learning,” she said. In the school’s first year, Driscoll started a trial run fifteen minute recess block for middle schoolers. “Nobody has ever looked back,” she said, “People realized it was a great release for students.”



Maureen White



Maureen White

The Boston Schoolyard Initiative has reclaimed 130 acres of asphalt and reached more than 30,000 children in Boston. Principals claim the schoolyards have improved student behavior, promoted exercise, and improved relations with parents and the community. Boston teachers are learning new teaching methods and developing new lesson plans. Other cities could consider learning the lesson of BSI’s success: If you want to improve urban education, get students out of the classroom.