ioby's Guide to
ENVIRONMENTAL PROJECTS IN SCHOOLS

5 Projects Any School Can Do to Make Environmental Learning Part of the Curriculum and Life in 5 Easy Steps

ioby

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KIDS LIKE TO GET MESSY

But most kids spend their days inside a classroom being told to sit still, raise their hands, take tests and keep their voices down. John Dewey, 20th century social reformer and educator, was on to something in his "learning by doing" concept. Most of us have experienced the genuine curiosity kids have about the world around them—why not encourage students to use their five senses to learn?

Whether your school is located in a big city or a small town, the environment is a natural extension of the classroom that can be experienced constantly—from stormwater runoff collecting on blacktop to fresh vegetables being served in the cafeteria. Not only is an outdoor classroom a great tool for learning abstract, academic concepts; it's also a great way to make interdisciplinary connections.

Moreover, with shrinking school budgets and increased focus on test scores, many classroom teachers have less time for STEM disciplines. An environmental project in a school can provide supplementary learning opportunities in these important fields.

And finally, outside of what's served in the cafeteria, many kids don't know where food comes from and how it affects their bodies. For many, especially students in urban areas, a school garden could be the only place that young minds learn about growing and preparing healthy meals.

Ok, I get that it's important to get kids to learn about the environment. But how do I do it?

We understand that time is limited and budgets are tight, so we created a guide to five simple projects any classroom can do in five easy steps with less than $500. So roll up your sleeves and get ready to get messy.

HOW TO START A SCHOOL GARDEN by Molly Culver

ioby Leader Molly is the Co-Farm Manager and Field Trip Coordinator at BK Farmyards. She has been an active urban farmer and food justice advocate in NYC since 2004, and holds a Certificate in Ecological Horticulture from the Center for Agroecology and Sustainable Food Systems. Molly began growing in El Girasol Community Garden in the Bronx, and honed her farming skills at Live Earth Farm in Watsonville CA, where she managed two acres of mixed vegetables, 30 goats, 12 sheep, and 300 chickens. Molly is a Just Food trainer and Farm School NYC teacher, and leads workshops on horticulture, food preservation, and animal husbandry.

STEP 1. Engage the School. Share your idea with the school's community, including teachers, administrators, custodians, the principal and even some students. Ask people for their ideas and their help creating a garden.

STEP 2. Pick a site. With your team, survey possible sites on the school property where you can build a garden. Be sure to consider light, shade, slope, access to water and where you'd put other pieces of the garden, like a compost bin. Determine where on the school's property you will build your garden. Perhaps establish boundaries of an area with bamboo stakes.

STEP 3. Plan your Plants. Based on your site, you can either build raised planting beds (in some cities, like NYC, all school gardens must be in raised beds) or plant directly in the ground. Plants need room to grow! Be sure your beds are at least one foot deep. Your garden layout will help determine what types of things you can plant.

STEP 4. Organize Student Involvement. You want students to feel responsibility and ownership for the garden. Have students paint signs for the crops they plan. Very young students can water plants weekly to observe growth. Middle and high school students can have more responsibility they do on their own. Perhaps they could even start a student garden club!

STEP 5. Connect the garden to the curriculum. Encourage teachers to make the garden and outdoor classroom. There are many lesson plans that can incorporate the garden to teach measurement, sun rotation, soils, drainage, seeds, food chains, organisms, art, literature and more. Have students make signs to explain what's happening in the garden. Be sure to let students harvest and taste crops along the way!

SUPPLY LIST & ESTIMATE COSTS

- Watering cans - $25
- Garden gloves - $6
- Shovels - $7
- Plants - $150
- Hose - $30
- Seeds - $20
- Non-treated lumber - $30
- Landscape fabric (as a barrier) - $10
- Soil - $100
- Compost- Free when you make it yourself!
- Signage Materials - $25
- Shovels - $25
- Trowels (10) - $70

Total = $478

RESOURCES ON BUILDING RAISED BEDS:

http://edibleschoolyard.org/sites/default/files/Raised-Beds-and-Container-Gardens_Annies-Homegrown.pdf

http://www.kidsgardening.org/node/83219

http://www.mastergardenerssandiego.org/schools/gardenbook/building_beds/downloads/Building%20the%20Beds.pdf

http://www.aginclassroom.org/School%20Gardens/How-To-Guides_For_School%20Gardening/Building%20the%20Garden%20Beds.pdf

HOW TO START A COMPOST PROGRAM

by Sashti Balasundaram & Jared Cole

ioby Leader Sashti Balasundaram is the garden coordinator for the Brooklyn Urban Garden School (BUGS). He is also a certified Master Composter from the Brooklyn Botanic Garden. He is also developing a start-up relating to compost. Need help? Reach him at Sashti.Balasundaram@bugsbrooklyn.org or @WeRadiateNY .

ioby Leader Jared Cole, New York, NY, is a Master Composter with the NYC Compost Project and ran both indoor and outdoor compost systems at a public K-8 school in the Bronx. He currently works for New York Cares where he plans environmental revitalization projects for volunteer groups.

STEP 1. Assess Your School's Waste and Sites. Find out what type of waste your school generates in the cafeteria and if your school has enough space to compost. A waste audit can tell you what is in your waste stream and what could be recycled, reduced or composted. Your site depends on availability but also on the materials you want to compost. Consider how much compost you expect to produce, whether there is space for sorting, mixing and sifting, and for students to participate and study.

STEP 2. Create a Compost Team! Teachers can incorporate composting into their curriculum. Students can work on maintaining the program, depending on their age and level of involvement. Involve the principal for approval and leadership along the way. Don't forget to include custodial staff. They nearly always deal with waste issues at schools and are great champions, too!

STEP 3. Build/Purchase your Bin. Compost happens in many forms! Compost systems may involve single bins, multi-bins, open piles, or even indoor containers. Selecting the appropriate system for your school depends on the amount of compostable material you expect, the amount of space you have, how much maintenance the school can contribute and the budget.

STEP 4. Get Started. Label your bins to share the do's and don'ts of composting. In the early stages, students and teachers may need to monitor any collection bins so that meats, dairy products, plastics or other trash does not end up in your compost stream. Practical tip: If the cafeteria is serving bananas, only ask for banana peels. Communicate the day's compostables on a white board during lunch. Measure the pounds collected, take photos and share the results with the school.

STEP 5. Educate for the Short and Long Term. Help teachers build compost into their curriculum, in examining food webs of the compost bin in science, writing poems/narratives about decomposers, or using thermometers to measure temperature differences in compost bins. Integrating compost into the curricula will help build long-term acceptance and recognition of why composting is an important part of your school.

MORE RESOURCES:

A great guide to all things composting: http://eartheasy.com/grow_compost.html

Some municipalities give away compost bins as long as the recipient completes a short course on how to compost. Find out more in your neighborhood!

Resources on Performing a Waste Audit:
http://www.nrdc.org/enterprise/greeningadvisor/wm-audits.asp
http://www.solidwastedistrict.com/projects/waste_audit.htm

HOW TO START A HEALTHY FOOD CULTURE AT YOUR SCHOOL by Stacey Ornstein

ioby Leader Stacey Ornstein is the founder of Allergic to Salad. She has developed curriculum, recipes, and taught healthy, international cooking classes in New York City for youth, young adults, and adults. She has developed recipes with The New York Times' Mark Bittman on his cookbook, Kitchen Express, the Food Network TV show, Cooking for Real, and recipe tested for Body and Soul Magazine. Her writing and recipes have appeared in numerous print and online publications, including a current partnership with Sustainable Table and the Kids Cook Mondays Campaign. Stacey has a Masters in History of Education from New York University and is a contributing editor to the textbook Contemporary Issues in Curriculum. See more at www.allergictosalad.com

Time: 45 to 60 minutes

Step 1. Set Your Goals. Do you want a healthier snacking culture? Do you want more families cooking together? Do students understand where food comes from? How to read food labels? Is soda a problem? Establish a baseline of the current school culture and craft a plan that is specific about what you want to improve.

Step 2. Get the Whole School on Board. The more people you have that "buy in" to a healthy culture and who are willing to set an example the stronger the message will be. Administrators, teachers, nurses, outside professionals, PTA/PTO and even the lunchroom staff could all be possible collaborators in a food program.

Step 3. Incorporate Lessons in the Classroom. Consider a Social Studies lesson on food and culture, an English class spent writing about a favorite holiday meal, or a Science class experimenting with reactions (think baking soda and vinegar. There are many ways to create a foundation of healthy food culture throughout the curriculum. How about start a school garden, or even just a window box garden with herbs that can be used in school lunches?

Step 4. Connect the Lessons to Daily Life. Reinforce classroom learning at home by connecting the dots. Get families and community members on board by hosting an after-school cooking workshop and invite parents to attend, or open up your school's community garden for a fall harvest day. Even small projects—like working with students to create a healthy eating guide to post on their fridge at home—helps spread the knowledge about a better food culture. Send messages home directly to adults, like a guide to healthy food options in the neighborhood or directions on how to access fresh food using financial assistance programs.

Step 5. Keep it Fun. Use activities to keep people engaged, like cooking classes, family cooking nights, contributing to a school recipe book, a garden-to-lunchroom program, revamping snack machines from student's healthy choices, a restaurant/chef partnership, or a suggestion box for the school lunch menu. These are a few examples of how to connect kids, their families, and the school environment to a healthier food culture in fun ways.

SUPPLY LIST & ESTIMATE COSTS

Needed supplies depend on the recipe you'll be making – keep it simple! Many supplies you may already have on hand or can easily have donated (by parents or community). If you have to purchase, invest in stainless steel. It won't break or collect mold as easily and will last longer.

- *20 - Aprons $60*
- *8 - Reusable Flexi Cutting Boards $32*
- *Child Safe Chef Knives $120*
- *4 - Stainless Steel Mixing Bowls $40*
- *4 - Stainless Steel Measuring Cups $40*
- *4 - Wooden Mixing Spoons $40*
- *1 - Immersion/ Stick Blender $30*
- *1 - Spatula $8*
- *1- Ladle $6*
- *1- Tong $7*
- *2- Cooking Mitt $20*
- *4 - Sponges $10*
- *1 - Dish soap $4*

*Tip: Reduce costs by growing your own, keeping it in-season and/ or requesting donations from markets.

*Tip: A recipe that serves 6-8 is a perfect size for everyone in a 20-student class to have a taste.

Find kid-friendly recipes online at www.AllergicToSalad.com

HOW TO BRING GREEN INFRASTRUCTURE TO YOUR SCHOOL

by Colleen Kirk

Colleen Kirk, Jersey City, NJ, is a nature enthusiast, community gardener and civil engineer. She leads Sustainable Jersey City's green infrastructure initiatives to educate the public and reduce stormwater runoff as well as several green infrastructure projects for the city of New York.

STEP 1. Assess your site. Note whether your school ground is completely covered with concrete and asphalt or if it has grassy areas, how large or small they are. When it rains, does water form puddles in any spots? Draw it on a map.

STEP 2: Install rain gauge. A rain gauge measures how much it rains at your school. Find a location for the gauge that has an open view of the sky and will not likely be disturbed. Make sure there isn't anything hanging over the gauge that could either block any rain or make extra raindrops drip into the bottle (like a tree, a power line or the edge of a roof).

STEP 3. Measure the school's roof area. Measure roof area and approximate site area from a bird's eye view map or building plans from the school's maintenance team. Count how many drains and downspouts you see on the roof. The roof will slope towards the drains. Do your best to measure the area of the roof that slopes to each drain.

STEP 4. Calculate rain to each downspout. Check the rain gauge after it has rained. This will usually be in inches. Divide by 12 to get the number in feet. Multiply this number by the area of each individual drain. Then multiply by 7.48 to get the number of gallons of rain came out of each downspout per storm. Do this for 7-10 rainy days and find an average rainfall amount.

STEP 5. Pick a Green Infrastructure strategy that works for you. Use the amount of rain going to each downspout and ioby's "Guide to Green Infrastructure" to determine the type of project that is best for your school. Talk to your principal about building one or more of these projects.

LIST OF SUPPLIES:

- *Rain gauge - $35*
- *Pencil*
- *paper*
- *calculator*
- *ioby's Guide to Green Infrastructure*

Time of year
Any

Time needed
Couple weeks to get 7-10 rainy days

Who needs to be involved? *Middle school classroom or after school program. If the rain gauge is installed in a central place, all the kids can keep an eye on the rainfall.*

Collecting, analyzing and applying rain data ties in well with math and science curriculums. This is the first step in thinking about how a school knows what kind of green infrastructure is right for them and how big of a system they'll need. Students can monitor rainfall for the year and plot trends, find the months with the highest and lowest rainfall, and compare it to documented data for their area. They can then design the green infrastructure that best suits the site.

HOW TO BUILD A RAISED BED

In many cities, the ground soil is contaminated with lead and shouldn't be used to growing vegetables, especially when you're working with kids. For this reason, some school systems like NYC Department of Education require that school gardens are in raised beds. But, you might want to use a raised bed for a school anyway, especially if you have poor rocky soil, live in an area with a high water table or lots of rain. Raised beds also allow soil to warm more quickly, and because no one walks on them, the soil is less compacted. Many teachers like to make raised beds 2-3 feet off the ground to make instruction with young students easier. So whether it's a requirement or a choice, here's how to build raised beds.

STEP 1. Plan Your Beds. Obviously the size of beds depends on the space you have available. Most raised beds should be at least 6 inches deep and up to 36 inches deep. Beds can be 4 feet by 4 feet or up to 8 feet by 24 feet long, but for classroom learning you may want to make smaller beds.

STEP 2. Mark Your Beds in the Ground. Find level ground with appropriate sun. Some groups use sticks and twine to mark off where beds will be built. Some groups use spray paint to show where the beds would be built.

STEP 3. Gather Materials. Use untreated lumber wherever possible. You can also use found material, like pallet wood, or used scaffolding lumber. If you're using reclaimed materials, it may pressure treated or may contain chemicals from their previous use, so be sure to clean the boards. Then paint the lumber with a non-toxic paint, water based coating or polypropylene liner. For more info see the Build It Green! NYC Big Blooms! Program.

STEP 4. Assemble the Bed. Use cardboard or landscaping fabric as a base to divide the possibly contaminated soil from your good soil. Connect the four pieces of wood by screwing them into 2x2s corner pieces.

STEP 5. Make it Beautiful! Have students paint signs for the beds and decorate the frames. This is the beginning of a long stewardship the students will have with the school garden.