GROWING A SCHOOL GARDEN

Introduction
There is increased interest in starting school gardens, particularly after the creation of a vegetable garden on the White House lawn in 2009 and the national attention childhood obesity and children’s lack of physical activity are receiving through First Lady Michele Obama’s promotion of “Let’s Move – America’s Move to Raise a Healthier Generation of Kids” (National Gardening Association, 2010).

School gardens can teach children about history, economics, poetry and math, but are still primarily used for science studies (Waliczek, 1998). Gardening is a great way to help children make good food choices, instill a love of nature, provide physical activity and teach about different cultures (National Gardening Association, 2010). It can “ignite a passion for successful learning and service” (AgriLife Extension, 2010).

Considerations for School Garden Start-up
Starting a garden involves more than digging, planting and watering. A lot of planning goes into developing a successful and sustainable school garden.

Basic Considerations:
Begin by deciding the purpose of and the goals for the garden. For example, will the garden be used by all the grades as an outdoor classroom or as part of the after-school enrichment program? Important questions to explore include:

- Are the principal, teachers and parents on board?
- Will the school district allow it?
- What are the liability issues and can they be resolved?
- What are the risks and how can you avoid them?
- Is there a viable site at the school?
- Is water available? What will it cost and who will pay for it?
- How big will the garden be?
- Who will help? Who are your partners? What kind of support will you need?
- Who is the garden leader(s)? How will the responsibilities be shared?
- What materials/equipment will you need?
- How much will it cost? Garden costs vary tremendously based on size and scope.
- Who will pay for it?
- Who will build it?
- What will you grow? Who will decide what to grow?
- What will you do with the food you harvest?
- Who will maintain the garden, particularly on weekends, holidays and during school breaks?
When starting your new garden project, plan on starting small the first year or so to work out garden use and maintenance logistics. A smaller garden is easier to manage and increases the likelihood of success. The following will answer some common school garden start-up questions.

**Site Selection Overview**

Where will you locate your garden? The site should be close to the classrooms and accessible to all garden participants, including those with special needs. Vegetables need a minimum of six hours of sunlight per day. More light will mean better growth and production. Plants need to be protected from the wind. Water must be readily available. Then, there’s the soil...

**A Worm’s Eye View – the Soil**

All successful plant production depends on a “healthy” soil. An ideal soil has:

- Abundant soil organisms including earthworms, insects and other soil life
- Space between the soil particles for air and water
- Good permeability – water soaks in easily
- Good water-holding capacity without staying soggy
- Good tilth or physical condition, with soil aggregates or crumbles
- Good organic matter content (Hefner et al., 2009).

If you will grow your plants in the ground, have a soil test done to find out what amendments are needed to build a thriving soil. Add compost, nutrients and amendments as directed by the soil test and till these in to a depth of 12 inches. A tractor may be required if the existing soil is compacted. A simple soil test may be available at your local Extension office for a nominal charge. Drainage and run-off may be concerns at some sites (Hefner, et al, 2009).

**Consider a Container Garden**

If you want to start small or don’t have a permanent site, you can always create a container garden (Figures 1-3). To grow in containers, do not use soil from the yard. This soil is heavy and doesn’t drain well. It may also contain disease organisms. Instead buy a sterilized commercial soil mix. Before adding the soil mix, make sure all containers have drainage holes at the bottom.

If your school will be using containers, the following chart will help you select pot size (Table 1). In general, bigger pots produce better. An additional 2 inches of depth can more than double your harvest for most vegetables (Figure 2). Note that containers are likely to retain summer heat and dry out requiring more watering than in-ground plantings. To minimize stress to plants, containers should be light in color and placed on a soil surface rather than on concrete or asphalt to reduce heat absorption. Mulching the plants and grouping containers close together can help retain soil moisture and reduce overheating.
Figure 1: Use small containers to start plants or to send home.

Figure 2: Bigger containers produce more veggies.

### TABLE 1
HOW DEEP SHOULD THE CONTAINER BE?
HOW FAR APART SHOULD THE PLANTS BE?
(University of California Cooperative Extension, 2010)

<table>
<thead>
<tr>
<th>Plant Spacing</th>
<th>Soil Depth</th>
<th>Plant Spacing</th>
<th>Soil Depth</th>
<th>Plant Spacing</th>
<th>Soil Depth</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>These are good for shallow planting boxes</strong></td>
<td></td>
<td><strong>These need moderate depth</strong></td>
<td></td>
<td><strong>These are deep-rooted</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Beet</strong></td>
<td>3” apart</td>
<td>9” to 12”</td>
<td><strong>Broccoli</strong></td>
<td>12” apart</td>
<td>12” to 14”</td>
</tr>
<tr>
<td><strong>Leaf lettuce</strong></td>
<td>6” apart</td>
<td>9” to 12”</td>
<td><strong>Cabbage</strong></td>
<td>12” apart</td>
<td>12” to 14”</td>
</tr>
<tr>
<td><strong>Onion</strong></td>
<td>3” apart</td>
<td>9” to 12”</td>
<td><strong>Cauliflower</strong></td>
<td>12” apart</td>
<td>12” to 14”</td>
</tr>
<tr>
<td><strong>Radish</strong></td>
<td>1” to 2” apart</td>
<td>9” to 12”</td>
<td><strong>Cherry tomato</strong></td>
<td>12” apart</td>
<td>14” to 16”</td>
</tr>
<tr>
<td><strong>Spinach</strong></td>
<td>5” apart</td>
<td>9” to 12”</td>
<td><strong>Eggplant</strong></td>
<td>12” apart</td>
<td>14” to 16”</td>
</tr>
<tr>
<td><strong>Swiss chard</strong></td>
<td>6” apart</td>
<td>9” to 12”</td>
<td><strong>Peas</strong></td>
<td>3” apart</td>
<td>14” to 16”</td>
</tr>
<tr>
<td><strong>Peppers</strong></td>
<td>12” apart</td>
<td>14” to 16”</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Carrots</strong></td>
<td>2” apart</td>
<td>9” to 18”</td>
<td>(depends on length of carrot)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Designing the Garden

Children’s safety is a primary consideration when designing your school garden. You’ll also want to consider:

- Ease of maintenance
- Costs of essential and secondary features
- Paths and walkways
- Irrigation system

For Little Gardeners With Short Arms - How Big Should Garden Beds Be?

Since children are the primary gardeners in a school garden, bed size should match their reach (Figure 4). They should be able to reach the middle of the bed without stepping into it. Foot traffic on soil compresses it and makes it hard for plants to grow. Beds should only be as wide as the smallest gardener’s reach. Beds that are 2-feet across provide easy access for pre-school children up to second–graders. Three-foot wide beds work well for all older students. Bed length can vary depending on the size of the site or the number of beds you want (for example, one bed per class).

To Frame or Not to Frame?

Framing a bed in with wood, cinder block, straw bales or other material retains the shape of the bed, particularly with lots of use by children.

Figure 3: Try combining containers and in-ground plantings.

Figure 4: Construct the beds so little people can easily reach across and possibly sit on the sides.

Figure 5: Watering teaches responsibility and is more fun with kid-sized watering cans.
Building a structure that allows children to sit on the side can be advantageous (Figure 4). However, increased cost may be a concern. Avoid pressure-treated wood or creosote-soaked materials such as railroad ties as the chemicals may leach into the soil and be taken up by the adjacent plants.

**Water is Life**

Plants require water. Gardeners must provide what Mother Nature does not. Although watering by hand is one of the children’s favorite garden activities and is a quick solution to watering, it is not sustainable. A key issue is who will water on weekends, holidays and school breaks? Also, hand-watering is too variable for good plant growth as it may be difficult to track when and how much water was applied.

It is best to use an automatic drip, soaker or sprinkler system run by a timer. Automated systems are much more consistent and dependable than watering by hand. When possible, let the children water the plants, as a supplement to an automated system. Watering by hand (Figure 5) involves the children in garden care. Introduce children to the concept of being responsible by teaching them how, when and how much to water.

Newly planted seeds need multiple mistings per day rather than occasional drenchings, which can wash seeds away. As plants develop, water them to a depth of at least 6 inches and then let the surface inch or two dry out before watering again. Crops such as lettuce, beets, green beans and chard draw water from the top foot or less of soil. Big plants such as corn or tomatoes have root systems that can reach 2 feet deep into the soil (Oregon University Extension Service, 2010).

**Good Fences Make Good Neighbors**

Is it necessary to fence a school garden? Fences deter vandalism and reduce theft (Figure 6). They keep little feet and soccer balls from flattening tender vegetables. Fences protect the garden from dogs and other critters. Some school districts will require a fence to address liability issues.

*Figure 6: Fences protect the garden and little gardeners.*

*Figure 7: Children love worms!*
Pest Control

When working with children, avoid herbicides, insecticides and other pesticides if at all possible. You might need a little help with aphid control. Hose the plants off or use insecticidal soap if the infestation is heavy. Hand pick larger foragers like squash beetles. After all, the school garden is an outdoor classroom and looking at aphids and beetles with a magnifying glass is a great learning experience.

Will You Have A Compost Pile?

Plants don’t care whether nutrients come from organic or inorganic sources. But, they do like their nutrients with a side of organic matter provided by compost. A school garden presents a wonderful opportunity to introduce composting to the students and school staff. Grass clippings, leaves, shredded paper, coffee grounds and non-meat food scraps can all be used to make a compost pile. Composting requires a suitable site, some water, occasional turning of the pile and the addition of compostable materials. The children can assist with all of these tasks.

There are many types of compost bins, from an informal pile to a multi-binned structure. Imagine the fun the children will have studying worms in a vermicompost bin (Figure 7). Be sure to set up the compost pile correctly so marauding critters don’t become a problem (Johnson, 2000). Spreading the finished compost on the beds or adding it to the containers can be done in early spring as one of the first activities that bring the children back into the garden.

Nurturing and Maintaining the Garden – Seasonal Considerations

Spring: Add compost in early spring to build up the soil and provide nutrients for plants. Early in the growing season you may have to protect plants from the cold using row covers or by planting in cold frames. Mulching the beds, helps hold in moisture and keeps weeds down.

Summer: Add additional compost or fertilizers such as those with a 16-16-16 or similar analysis or one specifically designed for vegetables to supplement plant nutrition. Weeding is always an ongoing chore in the garden. Adjust watering as the temperature rises. Regular harvesting is essential as vegetables ripen. Excess produce can be sold at a school-sponsored “Farmers Market” as a source of fundraising to support the garden.

Fall: Continue harvesting until the first hard freeze. Using row covers will offer protection and extend the growing season a few more weeks. Year-end garden cleanup keeps pests and diseases under control, and promotes physical activity while teaching students about the garden cycle (Figure 8).

Winter: Use this time to have the students plan next year’s garden.

Figure 8: Yearend cleanup teaches responsibility
Conclusion

Cultivate people as you cultivate plants. Your garden partners – teachers, parents and others – are essential to your garden’s ongoing success. With proper planning, consistent participation and support, a school garden can be an outstanding tool to expand learning opportunities. Gardens require commitment, but reward all participants with knowledge gained, exposure to vegetables and fruits, healthy exercise and connection to nature (Figure 9). You might even start a school farmers market!

References