Farm-to-School and Educational Garden Programs
A Resource Guide for Georgia Educators, Administrators, and Parents

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Les Dames d'Escoffier

P.L.A.C.E.
Promoting Local Agriculture and Cultural Experiences, Inc.

GEORGIA organics
# Table of Contents

**Introduction**
- Background: Farm-to-School ........................................... 3
- The Need for Farm-to-School in Georgia ......................... 4
- Educational Food Gardens: An Education Around Food and Growing ........................................... 4
- Organizations ........................ 5

**Farm-to-School: Getting Started** ..................................... 7
- How to Start a Farm-to-School Program .......................... 7

**School Gardens: Getting Started** .................................... 8
- Planning A Garden: First Steps .................................... 8
- Location Checklist .................................................. 10

**School Gardens: Growing, Care** .................................. 12
- Garden Spaces .................................................... 12
- Building a Garden: Different Models ......................... 13
- Growing for the Classroom .................................... 16
- Garden Maintenance .............................................. 16
- Planning for Summer Care ........................................ 16

**Garden Based Curricula** ........................................... 18
- Garden Themes .................................................... 18
- Suggested Classroom Readings: Kid’s Literature K-2 .......... 19
- Suggested Classroom Readings: Kid’s Literature 3-5th grade ........................................... 20
- Sample Lesson Plan: Worm Observation ....................... 22
- Sample Lesson Plan: Insect Diversity ........................ 25
- Sample Lesson Plan: Square Foot Gardening .................. 27
**Background: Farm-to-School**

**What is Farm to School?**

At a time when childhood obesity and nutrition-related disease is rapidly rising and America’s small farms are decreasing, Farm to School programs are emerging as thoughtful, holistic solutions. Farm to School programs connect schools with local farms. Their objectives include:

- serving healthy meals in school cafeterias
- improving student nutrition
- supporting small, local farmers

**Who is involved in Farm to School Programs?**

Farm to School programs generally strive to involve all of the stakeholders participating in school food web. These individuals include food service professionals, farmers, distributors, teachers, administrators, nutritionists, students, parents, and community members. Research has shown that it takes all of these groups working together to form a successful Farm to School program.

**Benefits of Farm to School Programs**

**Increased student nutrition.** Evaluations of Farm to School programs have shown to increase students’ consumption and knowledge of local and nutritious foods.

**Supporting local farmers.** With more than 30 million children eating the federally supporting school lunch every day, farmers have a great opportunity in selling food to community schools.

**Supporting local economy.** While most food travels over 1,500 miles before it reaches a plate, schools can choose to spend some of their dollars on fresh, local produce.

**Challenges for Farm to School Programs**

**Distribution.** Often, new distribution avenues must be explored, as finding a distributor that will provide local produce is sometimes more difficult.

**Lack of convenience.** Many schools rely on frozen, pre-cooked food, and no longer possess kitchen equipment or expertise to prepare fresh foods.

**Lack of time.** Schools on a budget often have a limited staff of food service professionals to prepare fresh food. Likewise, teachers in the classroom are often faced with strict state curriculum guidelines that must be addressed daily.
The Need for Farm-to-School in Georgia

With childhood obesity and food insecurity rates soaring across the nation, the lack of nutrition has reached critical proportions in the South. A logical solution to addressing the need for increased nutrition is to connect local farmers (who are struggling to find reliable markets and against the pressure to consolidate) with the school meal infrastructure. When children are introduced to tasty, fresh fruits and vegetables through creative menus, trips to farms, school gardens and nutrition education, research suggests that their knowledge and consumption of these foods increase. However, there is often much resistance to such a concept. Among several challenges, food service professionals lack the necessary equipment and time to process these foods, private food management contracts appear impenetrable to local farmers, and educators are faced with strict curriculum guidelines.

Presented with the innovative concept of farm to school, we can overcome the apparent barriers—but only through a highly cooperative regional system that addresses our challenges and highlights our unique opportunities. The Southeast boasts an ideal climate and abundant agricultural products, as well as rich, cultural culinary roots. But where there are pockets of successful farm to school programs sprinkled across our region, most are isolated and disparate in nature. A new system will be achieved through a comprehensive approach of creating strong partnerships with public health agencies, state and local governments, and other farm to school stakeholders.

Educational Food Gardens: An Education Around Food and Growing

There are many valuable lessons that never make it into a school’s curriculum. These lessons are the lessons of self-respect, respect for life and the environment, care and responsibility of the natural world, the value of cooperation and a healthy appreciation of and taste for eating your vegetables.

Increasingly, educators find it is possible to harness the innate curiosity and attention of students to teach these important life lessons while also sneaking in the teaching requirements demanded of them. Educational gardens make it possible to take kids outside to a garden. These engaging learning environments can teach students science with the life cycle of plants, teach history with a colonial garden, teach math by calculating the dimensions of raised beds, teach literature and mythology with a Native American three sisters garden, teach nutrition with healthy snacks made fresh from the garden, teach how food grows and where it comes from.
Organizations

**LES DAMES D’ESCOFFIER INTERNATIONAL: ATLANTA CHAPTER**

“Les Dames d’Escoffier is a leadership culinary organization composed of women who have not only achieved success in their profession, but who contribute significantly to their communities. Since its incorporation 25 years ago, Les Dames d’Escoffier has followed its mission to elevate the profession through mentoring members and helping worthy students succeed in their culinary careers. I am very proud to be a member.” ~ Julia Child.

Nationally, each Les Dames Chapter conducts fundraising projects and awards scholarships to women in culinary, beverage and hospitality industries. To date, the 25 Chapters around the US, Canada and Australia have collectively awarded more than $2 million in culinary scholarships.

The Atlanta Chapter is renowned for its well-loved annual fundraiser—Afternoon in the Country. Held each fall at Serenbe in Palmetto, Georgia, this food and wine extravaganza features more than 35 regional chefs, fine wines and micro-brews, a one-of-a-kind cake raffle and an exclusive silent auction. Proceeds from the event benefit the Atlanta Chapter’s scholarship fund and the Georgia farming community.

**GEORGIA ORGANICS**

Local foods, sustainable farms and healthy people – those are the primary goals of Georgia Organics in redefining a food production system that benefits farmers, consumers and the environment. Georgia Organics is a nonprofit membership organization whose mission embraces the following objectives:

- educate consumers on the benefits of locally-grown organics;
- educate farmers and gardeners on sustainable growing practices;
- educate agricultural professionals and conventional farmers on organic agriculture;
- mentor farmers new to organics;
- help existing organic growers improve their production and marketing;
- partner with communities striving to promote sustainable agriculture and food systems; and
- collaborate with institutions of policy, research, outreach and education to improve and increase organics in Georgia.

For information on where to source local foods in Georgia, review the Georgia Organics’ Organic Directory at [http://www.georgiaorganics.org/organic_directory/](http://www.georgiaorganics.org/organic_directory/) or Download the 2007 Local Food Guide at [http://www.georgiaorganics.org](http://www.georgiaorganics.org)
PLACE: PROMOTING LOCAL AGRICULTURE & CULTURAL EXPERIENCES

PLACE began in the fall of 2006 in Athens, Georgia as a group of individuals who were exploring the social consequences of our industrialized food system. The knowledge gleaned about the harms inflicted by our industrialized food system was staggering and demoralizing. How does one go about changing a system that pulls resources from around the globe? How does one change a system where the movements of these resources are intentionally obscured? How does one change a system heavily supported and subsidized by the government to the tune of $4 billion a year just in straight agricultural subsidies?

One possibility for change stood out as a solution so simple yet so powerful: local food. By growing and buying locally, we can address more than just the problems of the industrialized agribusiness. We can rebuild community: a community of small family farms, a community of eaters, a community of neighbors.

Unwittingly, we had stumbled into the local food movement. It is a movement global in nature but local in perspective. It is a movement that makes both mantras "Think globally, act locally" and "Think locally, act neighborly" ring true. A few visionaries, like Wendell Berry, have been advocating this movement for decades. In recent years, more individuals, communities, and organizations have joined, swelling the ranks and the local food movement has begun garnering national mainstream attention in the US.

PLACE is an organization situated in the local food movement, simply seeking to bring the benefits of a strong local food culture to our home, Athens, Georgia. PLACE believes that education about and access to nutritious unprocessed and/or minimally processed locally grown food is a right, not a privilege. PLACE believes that a sense of place is an essential building block for creating community. Eating locally and seasonally helps provide a palatable and pleasurable way of connecting with our place.

As an organization, PLACE provides dynamic and innovative educational messages and programs to convey the social, environmental, economic and nutritional benefits of a strong local food culture and pursues creative solutions to increase the availability of locally produced food to all Athens area residents.

PLACE is committed to a vision of public education in Athens where every public school has an educational food garden fully integrated into the curriculum, where food grown on site and at local farms dominates the cuisine offered in the cafeteria, and where students graduate with a sense of place, a taste of community, and an appetite for learning more about the world.
Farm-to-School: Getting Started

How to Start a Farm-to-School Program

There are many ways to start a farm to school program. Creating a successful Farm to School program takes a time and often starts with small changes in the classroom, cafeteria and community. Here are a few tips to get started:

HOST A FORUM FOR DISCUSSION

Invite all stakeholders to a community meeting to discuss the possibility of a Farm to School program. See that all participants have an opportunity to convey their thoughts on the challenges and opportunities presented.

DRAFT A POLICY

Having a written policy approved by the school board can be instrumental in sustaining and growing a program. See http://www.foodsecurity.org for examples.

UNDERSTAND FOOD SERVICE CONTRACTS

Often, a school district has a contract for food management services. While these contracts can be challenging, there are many examples of private contractors integrating local foods into school cafeterias.

ADOPT A CURRICULUM

Adopt a fully integrated nutrition curriculum that connects experiential learning at the farm and in the garden to healthy choices in the lunchroom and improved healthy throughout life.

TAKE A FIELD TRIP TO A FARM

Exposing students to a local, working farm is a great way to introduce their local food system. Have the farmer talk about food production and life cycles, and engage students in hands-on farm activities.

RESEARCH A VARIETY OF PROGRAMS

There are many different types of Farm to School programs, and there are several useful reports, case studies and evaluations. See www.farmtoschool.org for an overview of state programs.
School Gardens: Getting Started

Planning A Garden: First Steps

1. GET PERMISSION:
Before beginning, get official permission from your school’s administration. Ask what spaces are available for a garden.

2. CALL BEFORE YOU DIG:
Any digging job, even relatively small digs like for your school garden, require a call. To protect yourselves and others call the national number 811 or Utilities Protection Center @ 1-800-282-7411 to have any underground utilities marked. The call and the service are free.

3. GET ORGANIZED:
Purchase a large binder with paper and pockets to record your efforts, jot down your ideas, and keep resources materials and receipts. This “master binder” can be passed along from year to year to provide necessary information for future school gardeners.

4. PUT IT ON PAPER:
- Be conservative: Create a garden only as large as your school and its resources can maintain easily. A garden can always be expanded in years to come.
- Sketch it out: Prepare a basic drawing or diagram on paper. Include location, dimensions, walkways, water source, tool storage, and, if applicable, fencing/gate specifications. List the tasks necessary to construct the garden. **See Garden Location and Growing for more information.
- Pick your crops: Prepare a list of fruits, vegetables, herbs and flowers that can be successfully and easily grown during the available growing season. Determine how much can be planted; planting, blooming, and harvesting dates; row spacing; water and sunlight needs; and where to grow each in the garden.
- Keep records and photos: Record all dates, activities and expenses in the “master binder” as they occur to aid in planning for future gardens. Also, take a few photos each year to help document your activities. These records and photos can also be used in making stronger future grant proposals for your garden.
5. IDENTIFY VOLUNTEERS:

Identify and enlist the help of those who can help work on a gardening project, particularly those with gardening experience. This can include teachers, parents, local volunteers, Master Gardeners, and local organizations like PLACE and Athens Urban Food Collective.

6. GET IDEAS:

While this resource packet seeks to provide a strong foundation in educational gardens, visiting existing gardens at other schools in your area can help you with ideas for different layouts, locations, water sources, tools, and storage spaces. Ask about financial and local resources they may utilize.

7. IDENTIFY FINANCIAL RESOURCES:

For many schools, financial limitations may be the biggest challenge. A small amount of money and some creative partnerships can be enough to begin an effective school garden. Some funding ideas include:

- Asking your administration what is available from your own school budget;
- Soliciting donations from the PTA, local businesses, and parent. Donations can include mulches, seed, soil amendments, tools, supplies, and time; and,
- Identifying funding and grant resources. See the Appendix for an example of a successful grant application.

Make sure and send thank you notes, updates, and/or pictures to show appreciation and encourage future assistance.

8. WORK WITH TEACHERS AND SCHOOL ADMINISTRATORS:

Find out who is interested in participating in the garden and discuss the following options:

- Possible garden locations and garden designs;
- Whether gardens will be shared communally or divided up based on teacher or class; and,
• Who shares the responsibilities of constructing and maintaining the garden.

9. COMMUNICATE IDEAS:

It is extremely important to share your vision of the garden with others. Talk with your colleagues, the principal, parents and students about the garden project. Encourage the participation of students from all grade levels at your school along with their parents.

To share the maintenance responsibilities in the summer, talk to neighbors or people who run a summer camp in the area to help water and weed the garden in the summer months. Or come up with a schedule that can be shared among the teachers and parents.

Location Checklist

There are many considerations about locations when planning a garden. Here is a list of some of these considerations.

1. Water Source: A reliable water source should be as close to the garden as possible. A garden needs an average of an inch a rain a week, so in those dry weeks, someone will need to water the garden.

2. Good Drainage: To ensure good drainage, avoid depressions where water collects. Avoid putting your garden in the path of runoff from buildings or parking lots.

3. Level Ground: Sloping and hilly ground should be avoided when possible as it can make working in the garden difficult. Where level ground is unattainable, consider the use of swales and rain gardens to control water accumulation (see suggestions, tips, and resources below.)

4. Direct Sunlight: 6 to 8 hours of direct sunlight per day is necessary for the health of most garden plants. Avoid shady areas under established trees and in the shadow of buildings. Planting near trees and large shrubs will also create competition for water and nutrients.

Accessibility & Visibility: Children should have easy access to observe and work in the garden. Consider wheelchair and handicap accessibility as well. High visibility of the garden will also discourage vandalism. Who is using the site and how? Who needs access? When?

5. Secure & Safe: Garden locations should avoid being adjacent to high-traffic play areas, sidewalks, and streets or clearly demarcated to avoid unintentional trampling or damage. Ditches, stream beds, and waterways should also be avoided where snakes and rodents may invade the garden. Consider a fence or border planting and a lockable shed for tools.

6. Permanent: After investing time and energy into a garden location, the location should remain permanent. Check the future building plans of your school to make sure future
development will not threaten your garden location.

7. Multiple Locations: Consider multiple garden locations on school grounds to utilize the maximum amount of space available for the gardens.

8. Soil: Avoid soil that has been treated with chemicals, pesticides or herbicides. Use soil that is workable and loamy, that retains water and is well aerated. Determine if the soil is contaminated with lead or other heavy metals! The Center for Applied Isotope Studies (CAIS) at the University of Georgia will test soil samples for lead and other heavy metals. Contact Information: Rebecca Auxler (706) 542-6031. The fee is determined by what kind of sample is submitted and what kind of test is run.

9. Storage Space: Tools, supplies, and amendments (soil treatments) should be stored in a secure location as close the garden as possible.
Gardens evolve over time. Without proper planning this progression can leave a garden unorganized and chaotic. Good planning includes a comprehensive vision of your goal and a realistic assessment of what needs to happen, and when. Faithfully executing a well thought out plan allows the garden to develop smoothly and to build on its successes while keeping participants interested and invested in the project.

**Garden Spaces**

There are two main questions to answer in the planning process of a garden. First, how is the garden going to be divided up in terms of use? Two options are communal plots or individual plots. Communal plots are garden spaces and plants that are shared among all participants. Communal plots allow for crops that require more space, such as corn, pumpkin, or watermelon. Responsibility for communal plots are likewise spread among all participants. Individual plots are garden spaces divided up and assigned to particular groups or classes. Individual plots allow for these groups to make their own decision about garden design and crops. Responsibility for care is also clearly and easily defined.

Second, what type of gardening will occur. There are a variety of garden spaces, forms, and techniques available based on the use of the garden and the interest of the teachers and school administrators. Different garden spaces and techniques can be combined to create a successful project tailored to your school and lesson requirements. With time, your garden will evolve to maximize learning opportunities from season to season and year to year. Below is a list of gardening methods followed by a list of garden layouts.

**DIRECT PLANTING:**

Gardens can be planted directly in the ground of the school yard. Direct planting is best if soil conditions allow and access to equipment, such as tillers and tractors, are available. Consider the participation of the school maintenance crew to help with bed preparation and maintenance. If direct planting occurs, keep in mind the garden space will have to be well mark to distinguish it from the surrounding school grounds.

**RAISED BEDS:**

If soil conditions do not allow for direct planting, raised beds allow for safe and productive growing. A raised bed system uses untreated wooden boards or other safe barrier material to build a raised frame to be filled with soil or compost and seeds/plants grown directly in these...
beds. Raised beds in some ways are preferable to direct planting. A series of raised beds throughout a designated space can create a garden with easily defined growing areas and walking paths.

**CONTAINER GARDENING:**

If your schoolyard has little or no open, unpaved space, or if the soil is unsuitable for growing, consider a container garden. Pots, barrels, and buckets made of plastic, clay, or wood can be placed outside in a designated garden area. A wide variety of plants can be grown in containers, depending on the depth of the container.

**INDOOR GARDENING:**

Many schools have developed successful gardening programs located entirely within the walls of the school. Indoor gardening projects can vary from simply window sill planters to an elaborate system of growing lights and planting trays.

Indoor gardens can also be used to get a jump start on the growing season, allowing students to see a plant to harvest. Planting indoor gardens can also give students a chance to care for the plants in the classroom before moving outdoors to an established garden. An indoor garden can also be used with a science curriculum exploring concepts in life science and scientific experimentation.

If your school cannot grow plants outdoors, consider raising seedlings in the classroom to donate to another school, a community garden, or an environmental organization. Seedlings could also be sold as a fundraiser for your classroom or school.

**Building a Garden: Different Models**

No matter which method of planting you decide to use, the design of the garden itself will greatly influence its successes and its failure as it matures. The following fundamental design forms can be employed to save time in the design process and will result in attractive, functional, and balanced designs. Even the most complex designs are usually based on one or more of these basic design forms.

1. Rectilinear – A rectilinear design approach uses vertical and horizontal lines on set on a square grid. This design approach can work well with simple rectangular raised planting beds, using these basic shapes to create rhythmic, well balanced garden designs.

2. Radial – A radial design approach uses various sizes of circles that branch out from a central point and multidirectional straight lines on a radial grid. This approach, somewhat similar to a dart-board when viewed from above, divides a circular area into rings and wedges of space, maintaining a strong emphasis on the center of the garden where a teaching or gathering area could be placed.
3. Curvilinear – A curvilinear design approach consists of compound curves and the absence of straight lines on a square grid. This free-flowing design approach works well with water features. Use soft curves, and avoid shapes that look like an “S.”

Each design form carries with it characteristics that affect the overall feel of the space when completed. Planting a garden is an excellent way to improve a landscape. When considering your design, attempt to understand the existing shortcomings of your site and use the garden design as an opportunity to address the shortcomings of the space. In general, rectilinear designs are considered more formal and traditional than curvilinear, and complement traditional architecture well. Radial designs appear more bold and flamboyant than rectilinear, and can liven up an uninspiring area while giving it a strong sense of focus. Curvilinear designs are the most free flowing of the forms, creating soothing spaces.

Whatever approach is taken, remember to employ some of the following basic techniques to ensure good results (Adapted from Drawing and Designing With Confidence by Mike W. Lin.)

- Repeat a shape, but vary the size.
- Place elements at different heights.
- Line up elements in the space to create an organized, clean, systematic effect.
- When using a rectilinear approach, use parallel lines and 90 degree angles to maintain an orderly, structured appearance. If you choose to introduce 45 degree angles, do so with regularity.
- Don’t place elements at random. This creates visual chaos.
- Mass like objects and balance the masses, not the individuals. Counterbalance masses with voids.
- When possible, establish an axis and use focal points to terminate views.
- Use lines of trees or mounds of shrubs to create “rooms” for activities.

Engage your kids:

Before you settle on a garden design, refer to your students.

Ask for their input in the design process.

Create lesson plans around the shapes found in a garden plan.

Allow their creative to shine through.

Create opportunities for your students to become personally invested in their garden.
Remember that paths and storage areas take up space. Plan elegantly for all parts of the garden, not just the beds.

In a 50 square foot garden, 10’ rows with equal paths in between give up 40 square feet to the paths. In contrast, raised beds need only 10 square feet of path, while some specialized designs, such as a “keyhole garden” can lose as little as 6 square feet of space to a path. After you work your bed patterns out, plant any extra or wasted spaces with nitrogen fixing plants or insectary plants and wildlife food.

**COMBINE DESIGN FORMS WITH THE NEEDS OF PLANTS.**

Plan for the needs of your plants. Consider the types of spaces needed for each kind of plant to flourish. For example, consider the special needs of mounding plants, climbing plants, and spreading plants.

Make room in the design for support plants such as “nurse” plants and insectary flowers or shrubs. Design in a way that allows air and light to penetrate in healthy quantities.

Avoid designing large monotonous beds to avoid monoculture pest problems and difficulty accessing plants. Including a variety of shapes and sizes in the garden’s design lends itself to diverse planting, a necessity in a healthy, sustainable garden.

**COMBINE DESIGN FORMS WITH THE NEEDS OF THE GARDEN’S USERS.**

The shape and scale of each bed determines who can access it and how disruptive access will be. Design in a way that allows access to interior plants without disturbing the outer plants. Consider using a keyhole design.

Design gathering areas in a style that accentuates the planting areas and the design of the garden as a whole. In Ellen Walker’s garden at Alps Road Elementary school, the outdoor classroom circle and benches compliment the rectilinear repetition of the raised beds, providing contrast, “a gentle, workable conflict between elements.”

Path surfaces and raised bed heights should facilitate access by guests with disabilities. Make paths wide enough for equipment, such as wheel barrows, to move thorough the garden.

Remember to combine design forms with themes in the garden. For example, use a radial pattern in your Pizza garden. Plant the “slices” that result from the radial design. Place a sunflower house at the center of a radial garden, or an herb spiral.

An herb spiral coils up 20 to 30 feet of pathside plants into a roundish pattern about 5 feet across. It’s not just a flat spiral, either. Here’s how it works. An herb spiral begins as a mound of good soil about 3 feet high and 5 feet across. To turn this mound into a spiral, place fist- to head-sized
rocks in a spiral pattern that winds from the bottom inward to the top. Leave about a foot of soil between the tiers of the rock spiral.

Install the herbs in a winding path up the spiral. Note which side of the spiral faces north. The south facing side will be hotter than the north. The east facing side will dry out earlier in the day than the west. The soil at the bottom of the mound will stay wetter than the soil at the top. Varieties that thrive in hot dry climates such as oregano, rosemary, and thyme go on the sunny south side near the top. Parsley and chives which prefer cooler, moister climates find a home on the north side. Coriander, which dislikes too much hot sun, can be stationed on the east side protected from afternoon scorchings.

Keep irrigation in mind from the start of your garden project. An integrated stormwater management system can keep your garden green and help meet existing requirements that your school needs to comply with. Refer to the Suggestions, Tips and Resources section for advice on using rain gardens, swales, water barrels and permeable surfaces to help manage water in your garden.

**Growing for the Classroom**

The vegetables in the following table are good for the classroom and grow during the school year. The frost dates for our region are April 15 to November 15. Between these dates, you can rest easy about not losing outdoor plants to that are susceptible to frost.

For spring crops, consider an indoor garden to start a crop early that would otherwise not be harvestable till school let out for summer. For an easy math exercise get your students to help you see which of these crops can be planted and harvested during the school year without running in to summer break.

See Appendix B for a plant chart.

**Garden Maintenance**

What needs to be done?:
- Regular weeding, watering and maintenance.
- Determine if volunteers need to be recruited or if students/teachers can handle the necessary tasks.
- Do not expect school maintenance or grounds personnel to maintain the garden.

**Planning for Summer Care**

What will happen to the garden in the summer?

Ensure the garden will receive attention during vacation periods. Schools operating on traditional tracks need to determine if the garden will grow during the summer or be dug up and covered with mulch, plastic, or cover crops until Fall. Team up with a nearby community group or summer
children’s program to see if they might be willing to help maintain the garden over the summer.
Garden Based Curricula

Garden Themes

Garden themes can be extremely important to the functionality of school gardens. They provide a structure for making proposals, garden planning, and developing curricula. Garden themes also help get kids on board with particular projects. Below are a list of possible garden themes. This is not an exhaustive list. Be creative and develop your own themes with the input of your students.

THREE SISTERS / NATIVE AMERICAN GARDEN:

For centuries, many Native American tribes throughout North America have cultivated corn, beans, and squash. The term "Three Sisters" was primarily used by the Iroquois who live in the Northeastern United States and Canada. These crops were considered to be special gifts from Great Spirit and were believed to be protected by the Three Sisters—spirits collectively called the De-o-ha-ko, meaning "our sustainers" or "those who support us."

This ancient style of companion planting has played a key role in the survival of all people in North America. Grown together these crops are able to thrive and provide high-yield, high-quality crops with a minimal environmental impact. Corn, beans, and squash have a unique symbiotic relationship in a Native American garden. Corn offers a structure for the beans to climb. The beans, in turn, help to replenish the soil with nutrients. And the large leaves of squash and pumpkin vines provide living mulch that conserves water and provides weed control.

SALSA GARDEN:

Peppers, tomatoes, garlic and onions can be planted and fresh salsa made as an introduction to Mexican culture. These plants could be used to teach the difference between fruits and vegetables. How many of your students realize that peppers and tomatoes are fruits, not vegetables?

PIZZA GARDEN:

Almost all student (and teachers) love pizza! Imagine everyone’s delight when the students’ garden provides a delicious pizza for a classroom feast. By planting tomatoes, peppers, onions, basil, oregano, and other plants, students can grow the ingredients for a satisfying treat.

COLONIAL 4-SQUARE:

Fava beans, pumpkins, cabbage and radishes were some of the plants the colonists brought to America. Use the 4-square to introduce the colonial lifestyle. Pumpkins are a long keeping food source, an important factor in colonial life. They could be stored in the classroom through the fall and winter and used in many lessons, i.e.
determining circumference, nutritional information. The large, numerous seeds could be used to teach counting or seed anatomy.

**HISTORY GARDEN:**

There are a number of historically and contemporarily significant plants that can be grown in Georgia. The peanut, originated in South America, was brought to Europe by the Spanish, made its way to Africa and was brought to North America by slaves. Potatoes, also originally from South America, became a staple food of Europe. The Irish Potato famine and the exodus to Irish to America shaped a great deal of American history in the late 1800’s. Gourds, corn and cotton can, also, be grown and studied.

**TOP & BOTTOMS GARDEN:**

The edible parts of plants come from a variety of different places. For some plants, we eat the leaves of the plants which grow above ground. For others, we eat the roots hidden below ground. A garden of crops that produce edible tops (lettuce, colorful Swiss chard, collards, spinach) and edible bottoms (carrots, beets, radishes, potatoes, peanuts) provides an opportunity for students to explore the different parts of plants they eat and the nutrition stored in different parts. Teaching opportunities include nutrition, plant adaptations, and plant parts.

**NUTRITION GARDEN:**

Your garden can highlight nutritious food choices and can help students develop an understanding of seasonal produce that is locally grown. Learning where food comes from can link your garden to geography and history. Try developing a class cookbook that collects favorite recipes from the crops you’ve grown.

**Suggested Classroom Readings: Kid’s Literature K-2**

*Reading list compiled by the Appalachian Sustainable Agriculture Project Growing-Minds Farm to School program.*

**A Farmer’s Alphabet** by Mary Azarian - wood cuts that should be framed; each letter of the alphabet is a farm-associated word (play a game of thinking of other farm words that Mary didn’t use...make your own farm alphabet book!).

**Growing Vegetable Soup** by Lois Ehlert - All Lois Ehlert books are wonderful. Great book for introducing garden to young folks.

**Jack’s Garden** by Henry Cole - a cumulative text (similar to 12 Days of Christmas, building as you go, and explains how a garden works and the animals involved).

**The Moonflower** by Peter Loewer (an Ashevillian) not only do children learn about moonflowers but also about their pollinators and life that happens all around them! Great mix of fiction/nonfiction too!

**Over in the Garden** by Jennifer Ward - used as a counting book, to glean info about bugs in the garden...many choices. It also can be sung to the
tune of Over in the Meadow (has music score to play recorder or other instrument to).

**Round the Garden** by Omri Glaser - circular text

WRITTEN BY AN 8-YEAR OLD! Precious illustrations and children should get a kick out of a book written by a contemporary. Again the fict/nonfict as it does impart some useful info.

Some people may argue with me that there is any nonfiction in this book, **Tops and Bottoms** by Janet Stevens - a trickster tale that also shows the differences between root, leaf, and stalk vegetables.

**The Tiny Seed** by Eric Carle - great art, explains the cycle of life in a kid-like story fashion.

**Scarlette Beane** by Karen Wallace - a fantastic tale of growing vegetables; seeing the miracles of the garden; children will hoot with pleasure!

**Eating the Alphabet - Fruits & Vegetables from A to Z** by Lois Ehlert - a good way to introduce new veggies and fruits with a helpful glossary (there’s a video by Ehlert where she explains her art style; would be nice to view this in accompaniment to reading this book).

**Ten Seeds** by Ruth Brown – great to see what your kids can get out of this book; counting at the very least!

**Inch by Inch** by David Mallet – are you old enough to remember the Mamas and the Pappas? If so, you might remember this song that originally was a poem and is now a children’s book!

**Suggested Classroom Readings:**

**Kid’s Literature 3-5th grade**

Reading list compiled by the Appalachian Sustainable Agriculture Project Growing-Minds Farm to School program.

**Diary of a Worm** by Doreen Cronin - What a scream?! You learn a bit about worms and keeping a diary but you get plenty of laughs...for instance, one page reads “June 15 - My older sister thinks she’s so pretty. I told her that no matter how much time she spends looking in the mirror, her face will always look just like her rear end.” See?

**How Groundhog’s Garden Grew** by Lynne Cherry (so you know it’s good!) - I know what you’re thinking...groundhogs usually eat the garden, not grow it! Includes detailed illustrations that give a lot of information all by themselves with a wonderfully written story to tie it all together.

**This Year’s Garden** by Cynthia Rylant (anything by Rylant is wonderful, can’t go wrong) - tells the year in the garden with typical Rylant-poetic lyricism; good for rereading at different times of the year.

**Two Old Potatoes and Me** by John Coy - a wonderful new book that tells the story of
growing potatoes, with a recipe for mashed potatoes at the end. Also a subtle comment on divorce/separation to give comfort to children who might be experiencing that themselves.

The Gardener by Sarah Stewart - letter format, intriguing pics that need to be studied to get it, wonderful story.

The Scarecrow by Cynthia Rylant - beautiful illustrations, peaceful text, great for choral reading and writer’s workshop. My favorite book.

A Harvest of Color - Growing A Vegetable Garden by Melanie Eclare - wonderful photographs coupled with growing tips from kids.

A is for Appalachia! - The Alphabet Book of Appalachian Heritage by Linda Pack - Appalachia, the people, the geographic region, the culture…especially great for 4th graders!

Pumpkin Circle - The Story of a Garden by George Levenson - a first rate intro to the growth cycle coupled with outstanding photos and rhythmic text that provide a wealth of information! Winner of numerous awards. Beware though, pumpkins can be challenging to grow…find a farmer to help you!

Jody’s Beans by Malachy Doyle – a sweet story that also teaches you to grow pole beans!
Sample Lesson Plan: Worm Observation

Concept: To provide students with hands-on experience with worms and an opportunity to carefully observe them.

Objective: Students will be able to identify the environmental and agricultural benefits of worms, as well as identify worm behavior and habitat.

Lesson Outline:

1. Begin by asking students, “What doesn’t have eyes or ears, but has a mouth and can sense heat, light and being touched? After telling them that the answer is earthworms, ask if they have they ever seen an earthworm. Where do earthworms live? (in the garden, in the concrete, in our house?) How would they describe an earthworm?

After explaining that earthworms like to live in dark, damp soil, tell students that they are important to our soil because they make tunnels that allow air and water to enter the soil. In the process of digging their tunnels, earthworms mix soil layers which make it helpful for growing fruits and vegetables. Many farmers understand that when their soil is healthy, their plants will be healthy, and they will not need to apply chemicals that can be harmful to the earth.

2. Give each child a small pile of worms and soil. (be sure to give students a brief lecture on Worm Safety. Worms are just like us, they don’t like to be poked, prodded or torn in half. They also like it moist, but not too moist.)

3. Have children spend time gently observing the worms. Ask the students if they see:
   - Different sized earthworms?
   - Baby worms? Eggs?
   - Anything interesting on their body?
   - Eyes, ears, mouth, nose?

4. Have students conduct a few worm experiments and record their answers. (see Worm Experiment)
Worm Observation Worksheet

Observe your worm closely. Notice anything special? What does it eat? What do worm eggs look like? Is your worm round or flat? Is it male or female? Can it see or hear? Does it have teeth? Does it need soil to live? Does it need water? What are worm castings? Is the skin moist or dry? Any other observations? Record your observations.

What would you like to know about your worms?

How will you find out what you want to know about worms?

Record worm experiments. What did you find out?

What did you find out? Record your worm results.

Worm Experiments

Do worms like it wet or dry?

Set up wet versus dry conditions on opposite ends of an otherwise similar container. Place worms in the middle and record which way they go. Do they stay in one place? After 5-10 minutes, where are most of the worms? Repeat this experiment several times with different worms.

Do worms prefer darkness or light?

Set up dark and light conditions in an otherwise similar container. Place worms in the middle and record where they go. After 5-10 minutes, where are most of the worms? Repeat this experiment several times with different worms.

Can worms see or sense different colors?

Examine a worm carefully with a hand lens to locate eyes. Can you find any? Shine a bright light on the worm. What is the reaction? Cover the light with red cellophane and try again. Any reaction? Use different colored pieces of cellophane and record reactions. Can worms sense colored lights?

Is there a top and a bottom to a worm?

Examine a worm carefully with a hand lens. Note any differences in color, anatomy, and shape between present upper and lower sides. Turn the worm over. What happens? Record reaction. Repeat several times with this worm and others.
The Worms Go Marching Song

(Sung to the tune of “The Ants go Marching,”
Words by Kathy Lyons)

The Worms go marching on by one,
Hurrah! Hurrah!
The worms go marching one by one,
Hurrah! Hurrah!
The worms go marching one by one,
We better go now, here comes the sun.

Chorus

And they all go marching down into the ground,
Where it’s cool and it’s wet
Squirm, squirm, squirm, squirm
Squirm, squirm, squirm
The worms go marching two, by two...
We are part of the garden too

Chorus

The worms go marching three by three...
We eat your kitchen scraps for free.

Chorus

The worms go marching four by four
We’ll happily eat your apple core
Sample Lesson Plan: Insect Diversity
Submitted by Kyla Zora-Moore

Insect Diversity:
Grades: K-2

GA Professional Standards:

Materials:
• Label the Insect sheet
• Insect body song
• Insect Simon Says
• Optional:
• Bug nets
• Containers for insects
• Magnifying glasses
• Insect field guides

Time: 45 min

Vocabulary:
Insect, thorax, abdomen, compound eyes

Concept: To introduce insect anatomy and diversity in the garden

Objective: Students will be able to name insect body parts and understand that there are many different kinds of insects in their schoolyard

Lesson Outline:
• Ask class what they know about insects already

• Sing Insect Song (below) to learn body parts (works best with K-1; 2nd and 3rd graders might not be interested in singing)
• Play Insect Simon Says
• Demonstrate safe way to use insect nets, or how to safely catch insects with hands
• Go on an insect hunt—let class try to catch insects. If anything is caught, study it and try to identify it
• Conclusion: Write up how many insects were caught, how many were seen, how many different kinds were found, things that were found that were not insects (eg, spiders, pillbugs, millipedes, etc). Ask class what they thing the insects eat, where they live, etc.
• Hand out Label the Insect sheet for children to label and if time allows draw their own insect on the back.

Insect Body Song
(sung to ”Must be Santa” by Hal Moore & Bill Fredricks. Tune can be found at: http://www.youtube.com/watch?v=42_vCV2_gf0)

Adapted from: http://insected.arizona.edu/lesson_01/cricketsong.htm

What has three body parts and six legs?
Insects have three body parts and six legs.

What has a thorax, abdomen, and head?
Insects have a thorax, abdomen, and head.

Three body parts, with six legs,
thorax, abdomen
and a head. (clap, clap)
Must be insects (clap, clap)
Must be insects (clap, clap)
Must be insects in our room.

What has three body parts and two legs?
I have three body parts and two legs.
What has a chest, abdomen, and head?
I have a chest, abdomen, and head.

Three body parts,
with two legs,
chest, abdomen
and a head. (clap, clap)
Must be terrific (clap, clap)
Must be terrific (clap, clap)
Must be terrific, terrific me.

Simon Says

(Motions for Insect Body Parts)

Adapted from: http://insected.arizona.edu/lesson_01/bodysong.htm

Head (touch your head)
Thorax (touch your chest)
Abdomen (touch your stomach)
Six Legs! (hold three fingers out from each hand and place hands along your sides)
Eyes (touch your eyes)
Mouth (touch your mouth)
Antennae (place index fingers sticking up from the top of your head)

Wings (fold arms so elbows are sticking out from your sides and flap them up and down like wings)

Label the Insect

http://www.enchantedlearning.com/subjects/insects/label/insect.shtml

Read the definitions, then label the diagram below.

- Abdomen - The abdomen is the segmented tail area of an insect that contains the heart, Malpighian tubules, reproductive organs, and most of the digestive system.
- Antenna - An antenna is a sensory appendage that is attached to the head of adult insects. Antennae are used for the sense of smell and balance. Insects have two antennae.
- Compound Eye - Insect compound eyes are made up of many hexagonal lenses.
- Head - The head is the part of the insect that contains the brain, two compound eyes, the proboscis, and the pharynx (the start of the digestive system). The two antennae are attached to the head.
- Leg - All adult insects have six legs.
- Thorax - The thorax is the body section between the head and the abdomen. The legs attach to the thorax.
Sample Lesson Plan: Square Foot Gardening
Submitted by Kyla Zaro-Moore

Square Foot Gardening:
Grades: 1-3
Science, Math

GA Professional Standards:
MKP1
MKN2
M1M1
M1P1
M2M1
M2P1
M3M2

Materials:
• Square foot gardening crop guidelines handout
• Ruler
• One square foot of paper for each student - Ruler for each student
• Tape measure
• String
• Thumbtacks or tape
• Garden catalogs

Time: 45 min

Concept: To learn how to plan a garden using the square foot gardening method

Objective: Students will be able to design a garden and calculate the quantity and types of plants that may grow in each square foot.

Background: Square Foot Gardening is a type of intensive gardening based on the idea that the wide rows in conventional home gardening are a waste of time, work, water and space, and that more quality vegetables can be grown in less space with less effort, no chemical additives, and on any type of ground, since the underlying soil is not used in the garden. In this method, the garden space is divided into beds that are easily accessed from every side.

Lesson Outline:

1. Begin by providing an overview on the different techniques of growing vegetables. For example: in a field with a tractor, in a pot on a patio, all mixed together, each crop by itself.

2. Introduce the term “square foot gardening.” Explain that square foot gardening means that you can grow several different crops in a small space and that each crop will only have one foot to grow.

3. Have students measure out a 1’ x 1’ square on a piece of paper. Have students cut this square.

4. Hand out the crop guidelines. Have each child choose one kind of plant they want to plant in their square (you may want to have them research in garden catalogs). Ask students to divide their squares into as many equal-sized squares as the number of plants they are supposed to plant in one square foot. For example, if a child chose spinach, she would need...
to divide her square into 9 equal squares. Then, the students should draw a plant in the center of each of the smaller squares.

5. Once all the squares are finished, work together to make a 1’x 1’ grid on the floor (or in the garden) using the string and the tape or thumbtacks to hold down the ends of the string. Be sure that each student has space for their.

6. Have children organize in groups of the same vegetable, and then have the groups lay down their squares in the same area. When all the squares are on the grid, all of the similar vegetables should be grouped together (ie all beans, melons, squash).

Now the garden is planned! If possible, plant the garden as planned by the children.
Overview: Any school that plans to start worm composting of school lunch waste requires the estimation of how many worms will be needed and of how much waste worms can consume in a day. Too much food waste in a worm bin will sit, smell, and attract vermin. This lesson will help students to consider this when setting up a vermiculture project.

Lesson Outline:

1. Teacher begins the lesson by exploring student background knowledge of worms and composting or you may begin with the statement to your students. “Worms eat half of their body weight in food each day.” Teacher explains the goal to be how we can determine the amount of food 1 pound of worms can eat in one day and from that determine how much 1 pound of worms can eat in one school week.

2. Teacher will initiate discussion by asking students for ways to determine this; how can we figure this out? What materials do we need? How do we measure weight?

3. Divide your class into groups of 5 children. Provide each group with listed materials.

4. Students will then calculate how much food in weight is needed for a pound of worms each day and then a week.

5. After determining how much food is consumed each week, each group will begin measuring food on the scale.
6. Each group will place a container that will hold the food on top of the scale and begin weighing the food.

7. After they have weighed the food, then they will come together in a large group to compare results.

8. During the discussion, they will look at the waste that is thrown away each school day and how some lower density items such as salad will have more bulk than the same weight of potatoes.
Sample Lesson Plan: Farm to School Tomato
Excerpts taken from Healthy Food Healthy Soils by E. Patton & K. Lyons

Farm to School Tomato:
Grades: 5 and up
Math, Geography, Science

GA Professional Standards:
M3M4
SS5G2
SS5E1
S6CS1
SGC56

Materials:
• Local tomato
• Non-local tomato
• US Wall Map
• Globe
• Internet for research
• Farm to Table Worksheet

Time: 2 hours

Vocabulary:
Raw Material, Production, Distribution, Marketing, Calculate, Locally grown, Pollution, Consumer, Monocropping, Sustainable Agriculture, Pesticide, Herbicide, Fossil Fuel, Non-renewable resources

Concept: Trace the path of food production from farm to table and the resulting cost.

Objective: Student will be able to identify the process of shipping, processing, advertising, marketing, packaging, pollution, fuel/use, waste disposal of consumable foods and calculate the travel cost from farm to table.

Lesson Outline:
1. Begin the lesson plan by passing around two plates of cherry tomatoes (or other produce)—one that is local and the other that is conventional. Have students taste them and talk about the differences. Is one tastier, redder, firmer, glossier, more bruised? Begin discussion about the journey of the two tomatoes. Where did the conventional tomato come from? (If you can’t tell, you might research where most produce comes from—California). Where did the local tomato come from? How was it grown—conventional practices like pesticides, herbicides, monocropping or sustainable agricultural practices like no-till, cover-cropping and integrated pest control measures? Who helped plant and harvest this produce—tractors, migrants, elderly farmers, young family farmers? When was it harvested? Where did it go when it left the field? Where did it get processed? How did it get to the point of purchase? How many hands did the produce pass through before it reached our plate?

Note: some of these questions may be difficult to answer, but are great points of entry for research.

2. Have student complete the “Farm to Table” Worksheet
3. Locate on the wall map or globe the geographic origins of both tomatoes and the route they may have traveled to get to you. Have students estimate mileage.

Most of our food comes by truck, so figuring the local cost of diesel, and using the figure of approximately 6.5 miles per gallon (2.9 km/L) that a trucker gets from diesel fuel, what would be the cost just for shipping by truck? (the average mouthful of food is estimated to travel 1,500-2,500 miles or 2,500-4,200 km. (So 1,500 miles/6.5 mpg = 231 gallons @ $1.20 per gallon = $277.20) What are some of the other hidden costs that you could include? (Pollution caused by truck exhaust, energy use in refrigeration, packaging, costs for disposal— all very hard to quantify). What are some of their findings?
Sample Lesson Plan: Pocket Plant Pals

**Plant Pocket Pals:**
**Grades:** Junior High to High School

**Materials:**
- One sheet of absorbent paper towel for every student.
- Scotch tape and scissors.
- One zip-lock snack bag per student.
- A variety of vegetable seeds, enough for at least 4 seeds per student.

- If your students are young, get larger seeds such as squash or beans. Avoid very small seeds in all cases.

**Time:** 30 minutes preparation. One week to grow the seeds and make observations

**Vocabulary:**
- Radicle, Monocot/Dicot, Chlorophyll, Germination

**Concept:** This exercise teaches students to appreciate the complexities of food production as they care for their own plants from seed to fruit.

**Objective:** This exercise will teach your students about plant growth and seed germination—all those things that generally occur underground and out of sight. They will also develop a close connection with food plants that they can later nurture and grow at home in pots.

**Lesson Outline:**

**Exercise:** Cut one zip-lock snack bag in half through the zipper. Dip a paper towel in water to wet it; squeeze out excess water. Fold the towel so that it is just a little smaller than the remaining snack bag and place in the bag. Then center a couple seeds in the middle of the towel. If your students are older, have them choose different seeds. Tape the cut edge of the bag and secure the zip on the zip-lock. Voila! You now have a pocket plant pal. Place this pal in your pocket or wear it from a string around your neck. (The heat from your body will speed up germination.) And watch your pals grow.

**Observations:** Have your students watch over their pals for about a week. You can have them chart and draw the plants as they grow. Also have them record the length and color of the roots and stems on a daily basis.

**Questions:**
- What emerges first the stem or the root? When leaves emerge, how many do you see? Is your plant a Monocot or a Dicot? Do different seed species germinate at different times? What color are the plants when they emerge: green or yellow? What does this tell you about chlorophyll production? Does your plant produce a fruit or a vegetable? Do you eat the leaves, stems, roots, or fruits of this plant? How long do they estimate this plant will take to produce fruit or vegetable? Once they are done with the experiment they can plant their seedlings in a pot and continue to watch them grow.

Garden Based Curricula
Sample First Grade Unit
Curriculum
Prepared by Ellen Walker, Alps Road Elementary School, Athens, GA

Unit One Organizer: Life Science
BUDDING BOTANISTS
1 week and on-going

KEY STANDARDS:
S1L1 Students will investigate the characteristics and basic needs of plants and animals.
  c. Identify the parts of a plant: 1. root, 2. stem, 3. leaf, 4. flower.

RELATED STANDARDS:
S1CS1. Students will be aware of the importance of curiosity, honesty, openness, and skepticism in science and will exhibit these traits in their own efforts to understand how the world works.
  a. Raise questions about the world around them and be willing to seek answers to some of the questions by making careful observations and measurements and trying to figure things out.
S1CS4. Students will use the ideas of system, model, change, and scale in exploring scientific and technological matters.
  a. Use a model-such as a toy or a picture-to describe a feature of the primary thing.
  c. Compare very different sizes, weights, ages (baby/adult), and speeds (fast/slow) of both human made and natural things.
S1CS5. Students will communicate scientific ideas and activities clearly.
  a. Describe and compare things in terms of number, shape, texture, size, weight, color, and motion.
  b. Draw pictures (grade level appropriate) that correctly portray features of the thing being described.
S1CS6. Students will be familiar with the character of scientific knowledge and how it is achieved.
  b. Science involves collecting data and testing hypotheses.
  d. All different kinds of people can be and are scientists.
S1CS7. Students will understand important features of the process of scientific inquiry.
  a. Scientists use a common language with precise definition of terms to make it easier to communicate their observations to each other.

UNIT UNDERSTANDINGS:
• Students will understand that…
• Plants are living things.
• Plants have basic needs - air, water, light and nutrients - to live.
• We can eat many plants or parts of plants.
• Plants can be cultivated or be wild.
• Trees are plants and are either deciduous or evergreen.
• Some plants are poisonous or have other features that make them harmful.
• Some plants have medicinal value or are the basis of many of our medicines.
• Why do we need plants in our environment? (Plants produce oxygen, clean the air, provide shelter and food, prevent erosion, etc.)

ESSENTIAL QUESTIONS:
• What is the definition of a plant? (Plants are living things, members of the kingdom Plantae, which grown and reproduce, typically make their own food from sunlight through photosynthesis and that lack the ability to move on their own.)
• What is the difference between plants and animals if both are living things?
• What does a plant need to live?
• Why do plants need air, water, light, and or nutrients?
• How do plants use air, water, light and nutrition to live and grow.
• Where do plants get their food?
• What plants can be eaten by people or animals?
• Why are plants important to our environment?

Students will know…
• What a plant is
• What plants need to survive: water, air, light, and nutrients
• Definitions of: air, water, light, nutrients
• Cultivated plants need care to live and thrive.
• Other vocabulary: plant, seed, sunlight, soil/dirt, change, flower, seed pod, stem, branch, leaf, roots
• Extended words: fertilizer, nutrient, grow, wilt, cultivate, photosynthesis
• How to record information in a journal.
The parts of a plant.
Some common edible plants and some common poisonous plants in our immediate environment.
How to plant and tend a seed.
How people use plants – food, shelter, medicine, decorative, etc.

Students will be able to...
• Identify what a plant is and what it needs to live.
• Identify the parts of a plant: flower or other seed pod, stem, branch, leaves, roots.
• Plant a seed and tend it until it matures.
• Identify some common plants in their immediate environment, e.g., pine trees, oak trees, azaleas.
• Recognize that much of what they eat comes from plants (fruit, vegetables, etc.) and the part of the plant that they eat (stem, leaf, etc.)
• List the benefits of plants to our environment.

HOW WILL WE KNOW WHEN WE GET THERE?

Performance Task(s):
• Read informational texts about plants.
• Plant seeds (indoors in small cups) and tend to their basic needs to keep them alive.
• Keep a class journal telling what was needed to meet the basic needs of the plants and to document their growth and development, including photos.
• Transplant the seedlings to an outside garden area at school or at home. Continue to tend it.
• Sketch and/or use a picture of a plant and label its parts. Explain what each part does.
• Research and write a report about a plant of choice. Compile into a class book.
• Paint a mural with each of the plants students have chosen showing their environment or the part of the world they live in.

Other Evidence:
• Self-selecting informational books on plants during independent reading time.
• Anecdotal teacher records on participation in discussions, asking and answering questions.
• Writing workshop conferencing during preparation of report

HOW WILL WE GET THERE?

STRATEGIES FOR TEACHING AND LEARNING:
• Investigate plants and their needs by comparing the health of plants under different conditions. Make a list of ways to determine if a plant is healthy and how to determine if a plant is not healthy, such as changes in its leaves, roots, stem, or flowers.
• Draw, measure, and record changes over time of plants (student planted and tended seeds). Measure the plants periodically to note any changes. Record watering, sunlight changes, etc. Measure the height, number of leaves, size of leaves, number of flowers, etc. Keep a plant journal or bulletin board display for your measurements, drawings and conclusions.
• Take photos of seeds as they grow and develop and then when they are transplanted outdoors. Compile into a class book.
• Conduct research on plants around the world and what they are used for – food, shelter, medicine, etc.
• Each child selects one plant to write a report on.
• Make available a variety of informational books and magazines about plants in the classroom library or at a science center.
• Visit the school or public library to read/check out books on plants.
• Make a chart with the headings: Flower, Fruit, Seed or Seed Pod, Stem, Leaves, Roots and list all the foods we eat that fit under these categories. (e.g., Flower – broccoli, cauliflower, artichoke; Fruit – apple, pear, banana, plum; Seeds and Seed Pod – green beans, peas; peanuts; Stem – asparagus, celery; Leaves – lettuce, parsley, spinach, collard greens; Roots – potatoes, onions, carrot; etc.)
• Read at least one informational text about plants per day during the week.
• Include informational texts on plants during guided reading.
• Place pictures of different plants onto a map of the world showing the area in which they live. Have children cut pictures from magazines, print from internet or let children draw them.
• Optional Activities:
  • Each student can make a 3-D model of a plant using pipe cleaners, tissue paper, construction paper, yarn, clay, etc., showing all the essential parts of a plant.
  • Each student can make a sunflower glyph – Provide a template to cut out a sunflower - center, petals, stem, leaves and roots (yarn):
    • Color the center of the sunflower black if you are a girl.
    • Color the center of the sunflower brown if you are a boy.
    • Put petals on your sunflower – how old you are plus 1 “to grow on.”
    • If you have a pet, put a dark green stem on your sunflower.
    • If you do not have a pet, put a light green stem on your sunflower.
    • Put a dark green leaf on your stem for each sister you have.
    • Put a light green leaf on your stem for each brother you have.
    • Put yarn roots on your sunflower – one root for each person in your family.
• Hang up the sunflowers with a key to the glyph.
• Begin a school garden – large or small – for children to transplant their seedlings into and continue to tend them to maturity.

DIFFERENTIATION EXAMPLES:
Challenge:
Students will create a “book” that includes ALL features of an informational text; cover, table of contents, at least 4 pages of facts with headings, and an index. Students will use MORE than two resources to write their book about a particular plant. Students will conduct research independently during reading work stations or during reader’s workshop work time. Students will create their own personal graphic organizers when reading/writing texts (i.e., index cards, webs, outlines) Students will illustrate each page of their book relevant to the facts. Students will have access to books that are on their independent reading level for independent reading time.

Adjust:
Students will receive individual and/or parapro support. Students will have assistance in selecting a plant to research and receive a template to help organize their writing. Informational resources may be paraphrased and/or read aloud by a tutor when students are gathering data. Students will have assistance in research by being read to, dictating facts for their report during writing workshop. Students will draw pictures for their report or will be allowed to copy or cut pictures from a magazine or from an internet source to illustrate their report. Students will have access to wordless picture books for independent reading time.

RESOURCES:

Rigby Big Books:
• How to Grow a Sunflower/Hyacinth
• Food Alphabet

Rigby Guided Reading books:
• Food From Plants
• In the Yard
• My Plant
• Peanuts
• The Fantastic Pumpkin (fiction but shows growth of a plant in a fun way)

Other sources:
There are thousands of good books about plants for children. Here are a few:
• The Oxford Children’s Encyclopedia of Plants and Animals (Hardcover - Sep 30, 1999)
• Food Plants (Britannica Learning Library) by Encyclopedia Britannica
• Plants: Grades 1-3 (Science Works for Kids Series) by Jo Ellen Moor and Marilyn Evans (Paperback - Nov 1, 1998)
• What Is a Plant? (The Science of Living Things) by Bobbie Kalman (Paperback - April 30, 2006)
• From Seed to Plant (Rookie Read-About Science) by Allan Fowler (Paperback - Nov 2001)
• Time For Kids: Plants! (Time For Kids) by Editors of TIME For Kids
• The Magic School Bus Plants Seeds: A Book About How Living Things Grow (Magic School Bus) by Joanna Cole

Some useful websites:
http://www.agclassroom.org/kids/index.htm
http://www.teachthechildrenwell.com/science.html#plant
http://www.picadome.fcps.net/lab/curl/plants/default.htm
http://www.bbc.co.uk/gardening/gardening_with_children/plantstotry_easy1.shtml
http://gardeninglaunchpad.com/kids.html
http://www.urbanext.uiuc.edu/gpe/index.html
http://www.sciencenewsforkids.org/pages/teacherzone/websites.asp

HOW CAN FAMILIES SUPPORT THE TEACHING AND LEARNING OF THIS UNIT?
• Read to and with student daily
• Provide space and writing materials for students to use daily
• Model writing for a purpose (grocery lists, notes, letters)
• Communicate with classroom teacher and other specialists as needed via notes, letters, agendas, telephone and/or email.
• Assist student with a daily written record of books read throughout the year
• Check informational texts about plants out of the public library, read with your child
• If there is a place at home or in the neighborhood - plant some flowers or vegetables with your child and help tend them.
• Take a walk around the neighborhood or at a park and talk about the different plants and what your child notices about them.
• At the grocery store, talk about the plants in the produce section and whether they are fruit, leaves, stems, roots, seeds, etc.
Suggestions

COMPOSTING:

Landscape refuse, such as leaves, grass clippings and trimmings, accounts for up to 20 percent of the wastes being placed in landfills. Composting is a cheap alternative to buying soil, adding organic matter to your soil, and effective means of managing landscape refuse. Compost is the partially decomposed remains of plants. In its final state of decomposition, it is referred to as humus. Consider starting a composting program at your school along with the participation of the cafeteria staff (food scraps) and the schoolyard maintenance crew (grass clippings). Having a compost pile facilitates winter lessons when not much will be growing in your garden and allows students to see the completion of the life cycle: decomposition.

WORM BINS:

An alternative to the conventional compost pile is a worm bin. Any waterproof, covered container may be used. Fill the container with damp shredded newspaper and add red wigglers from your local bait store. Feed your worms vegetable scraps. Your bin maybe kept inside your classroom or outside in a protected spot. The worm castings produced will boost your soil’s fertility. The worms can be also used to study invertebrate anatomy and food webs.

POLLINATORS:

The majority of plants in a vegetable garden require a pollinator. Even those capable of self-pollination produce better quality fruits if cross pollinated. Planting a variety of flowers with different shapes and colors in your vegetable garden will attract butterflies, hummingbirds, honey bees, native bees, moths and hoverflies. This will increase the bounty of your garden. Butterflies and native bees can be attracted to a butterfly puddle. A puddle will provide water and minerals as well as mud for nests. Planting parsley, dill and milkweed as food for butterfly larvae will add another attractive layer to your garden. The larvae and pupa can be observed and used in teaching insect anatomy and morphology.

Providing nesting boxes for native bees is another way to attract pollinators to your garden. Nesting boxes for native bees are easily constructed of untreated wood. They can be hung on buildings near the garden. This can be used to introduce the dangers of habitat loss by urbanization and show how we can reverse some habitat loss by simulating natural habitats. If you school has a wood shop, you could suggest the bee box as a project for one of their classes.
RAIN GARDENS:

Rain gardens are water collectors, designed with a dip at the center to collect rain. Any degree of indentation is useful, from slight dips made with your garden trowel to large swales created by professional landscapers. Neatly trimmed shrubs, a crisp edge of lawn, stone retaining walls and other devices can be used to keep garden edges neat and visually appealing. Strategic placement next to hard surfaces such as alleys, sidewalks, driveways and under gutters makes your rain garden more effective. Hardy native species that thrive in your area are the best choices for plant material. Many rain gardens feature shrubs as well as wild flowers and grasses.

Provide for overflow in times of heavy rains. A small culvert or swale may be used to move excess water to another raingarden. Loosening compacted soil will increase infiltration of water into the soil. Infiltration will also increase with the addition of humus, or a mix of humus and sand.

SWALES:

A Swale is a ditch on the contour of your site. It does not direct water, but holds it and allows it to gradually infiltrate the soil down-slope of it. A swale can be disguised as a dry creek providing interest to the landscape when dry, and acting to divert and direct water runoff after heavy rains. Soil and water run-off are caught in the swale which becomes a fertile area. If you have a sloping planting area, consider integrating swales into your design as they can help avoid the need to irrigate and reduce total site runoff.

WATER BARRELS:

Water barrels are frequently used to catch water runoff from the roofs of buildings. This collected water is free and considered “grey water.” Grey water is not for human consumption but is great for watering a garden. Water barrels should have lids, overflow mechanisms, and hoses attached.

PERMEABLE SURFACES:

When adding, repairing or rebuilding gathering areas and garden pathways, consider paving blocks, permeable pavements, grass driveway strips, wood decks, wood chips, and crushed rock rather than concrete or asphalt. These materials allow rainwater to soak through and help reduce and improve the quality of stormwater runoff.

Tips

COMPANION PLANTING:

There are many plants that benefit from being planted together. This compatibility can be used in your garden. Basil and tomatoes, beans and beets, corn and pumpkins are a few examples of companion planting. Remember that there are plants that are incompatible, too. Garlic is incompatible with beans and peas. Potatoes and squash should not be planted together. See the Companion Planting Chart in Appendix B. Look
online for additional information on companion planting.

**INTEGRATED PEST MANAGEMENT:**

The overuse of pesticides and herbicides has become a world wide problem. To protect your students from the known and unknown dangers of pesticides and herbicides, we strongly recommend using organic growing methods in your school garden, especially if the student will be enjoying any of their harvest.

Consider an integrated pest management program for your garden rather than resorting to chemicals. There are some insect repellant plants such as marigolds, garlic, and nasturtiums. Marigolds discourage root nematodes, squash bugs, tomato hornworm and bean beetle. Garlic repels aphids and Japanese beetles. Nasturtiums repel potato bug and white fly. Insecticidal soap and homemade insect repellents are another non-chemical way of protecting your plants from insect damage. In a small garden, handpicking the harmful insects also works. The insects could be preserved and used in the classroom. The home integrated pest management specialist at the University of Georgia is Holly Thornton. Her office can be reached at 706.542.8987.

Even if your garden suffers from disease or pests, there are still many valuable lessons to be learned. Gardening and farming are part of nature’s processes, and therefore subject to these natural occurrences.
Edamame Puree
Submitted by Linton Hopkins, Restaurant Eugene
Serves 8

INGREDIENTS:
• 2 c. Blanch ed and shocked edamame (from the freezer section)
• 1/2 c. buttermilk (can substitute sour cream & milk)
• Coarse salt

INSTRUCTIONS:
1. Puree edamame in blender adding buttermilk in small quantities.
2. Adjust seasoning with kosher salt.

Serve with crackers, tortilla chips, pretzels toast or bread sticks. Also good with raw vegetables such as carrots, celery, cauliflower and red bell peppers.

Yogurt, Almond, Mint and Honey Dip
Submitted by Linton Hopkins, Restaurant Eugene
Serves 8

INGREDIENTS:
• 2 c. whole cow’s milk or goat’s milk yogurt
• 1/6 c. honey: such as orange blossom or clover
• 1/4 c. toasted crushed almonds
• 8 each mint leaves, sliced into thin strips

INSTRUCTIONS:
1. Stir items together

Serve with fresh fruit such as apples, pears or bananas, granola or granola bars. Great on graham crackers.

Sour Cream, Lemon and Herb & Spice Dip
Submitted by Linton Hopkins, Restaurant Eugene
Serves 8

INGREDIENTS:
• 2 c. whole fat sour cream
• 1 ea. lemon (zest only)
• 1 tsp. chopped parsley
• 1 tsp. minced chive
• 1/4 tsp. paprika
• 1/8 tsp. garlic powder
• salt, to taste

INSTRUCTIONS:
1. Stir items together, adjust salt.

Serve with small toasts, tortilla chips, organic potato chips, pretzels or raw vegetables such as red bell Peppers, Carrots or Broccoli.

Pimento Cheese Dip
Submitted by Linton Hopkins, Restaurant Eugene
Serves 8

INGREDIENTS:
• 1 ea. red bell pepper (or 1/2 c. jar red minced pimentos)
• 8 oz. grated sharp cheddar
• 2 oz. soft cream cheese
• 3 tbl. mayonnaise
• Salt and black pepper

INSTRUCTIONS:
1. Turn on broiler in oven. Place pepper on sheet pan and char on one side until black. Turn and rotate until pepper is black all over. Place in a plastic bag and let sit sealed until cool.
2. Rub off charred skin, remove seeds and chop into small dice pieces.
3. Mix all and adjust seasoning.
Serve with saltines, small toasts, tortilla chips, organic potato chips, pretzels or raw vegetables such as red bell Peppers, Carrots or Broccoli.

**Kabobs**  
*Submitted by Joe DeBlasi, Sodexho/Jackmont*

Kabobs are an excellent and simple treat that is versatile enough to take advantage of the different growing seasons. Use locally grown ingredients where you can and supplement as needed.

Some suggestions for kabobs include:

- **Fruit kabobs**: local strawberries, blueberries, figs, apples, or peaches.
- **Vegetable kabobs**: local cherry tomatoes, bell peppers, zucchini, or squash.
- **Fall vegetable kabobs**: local roasted pumpkin, butternut squash, or sweet potato.

Wash, peel, and cut the items into similar size chunks and drizzle with lemon juice or Pineapple Juice to prevent browning. (If younger kids are helping, supervise them so they do not poke themselves.)

Place 6-7 pieces on each skewer, alternating colors, shapes, and textures. Use smaller items like grapes or cherry tomatoes on the ends of the kabobs and leave space at each end of the skewer for easy handling.

If you’re serving your kabobs fresh, stack them on top of each other on an oval platter or fan them out in a pretty circle on a round plate. (Keep them in a re-sealable plastic bag or plastic container until you are ready to serve them.)

**Winter Ministone**  
*Submitted by David Sweeney*

**Ingredients**

- 1 tbsp olive oil
- 2 leeks, white and tender green parts chopped
- 1 celery rib with leaves, sliced
- 1 cup sliced cabbage (savoy, chinese, even collards... all growing now)
- 2 carrots, sliced
- 2 cups cubed winter squash
- 4-5 fresh sage leaves
- 6 cups veggie stock

**Recipes**

Feed your kids right:

“Nutrition is what I think of when it comes to school lunches.”

~David Sweeney

There are so many simple solutions to feeding our kids healthy nutritious food:

- Roasted potatoes with organic sugarless ketchup.
- Mac-and-cheese made with organic dairy, whole-grain macaroni and free-range eggs.
- Substituting sweets and junk food with fruits, nuts, and real sweets toast with butter and local honey.
• 3 cups cooked beans (any bean...chickpea perhaps)
• coarse sea salt
• 3/4 cup small-shaped pasta or broken spaghetti
• fresh black pepper

INSTRUCTIONS
1. In a heavy pot over medium heat, warm oil. Add leaks, celery, cabbage, carrots, squash. Saute 5-7 minutes until soft.
2. Add sage, stock, raise heat to boil.
3. Add beans, reduce heat to low. Simmer 20-30 minutes until vegetables are tender.
4. Cook pasta in separate pot with sea salt. Drain and add to soup.
5. Season with salt & pepper.

Lettuce Wraps
Submitted by Barbara Petit, Petit Cuisine

A Thai inspired roll-up which can be used for a lunch or snack.

This is a flexible recipe. First identify the ingredients you have on hand, vegetable and/or protein. Spoon these ingredients into a lettuce leaf, add a bit of sauce, roll and eat.

PREPARE THE SAUCE:
• 1/2 cup water
• 1/2 cup brown sugar or honey
• 2 tablespoons Asian fish sauce
• 2 tablespoons finely diced fresh ginger (local when available)
• 2 tablespoons roasted salted Georgia peanuts (local)
• 1/4 cup unsweetened shredded coconut. (Not local)

Mix water and sugar or honey in saucepan, bring to a boil and reduce the liquid to about a half cup (around 5 minutes). Remove from heat and add other ingredients. Let come to room temp. This can be stored for several days. (Adapted from Comfort Me with Apples by Ruth Reichl.)

THE WRAP...LETTUCE:
Use fresh leaf or butter lettuce, clean and pat or spin dry, as many leaves as you like.

FILLINGS:
Proteins: Leftovers are great for this. Choose one! All local!
• Braised pork shoulder or butt, shredded
• Shredded happy chicken, light or dark meat
• Georgia white shrimp
• Prepared flank steak, sliced into slivers

Veggies: Choose several! All local!
• Shredded carrots
• Shredded radishes
• Shredded Hakuri turnips
• Finely chopped onion of any sort
• Chopped roasted Georgia peanuts
• Chopped cilantro or parsley
• Chopped chilis

TO SERVE:
Place lettuce leaves and fillings on a platter and serve with wedges of lime and the sauce.

Everyone can make their own or assemble in packets for school lunch or snack.

Eat! Enjoy!
4-H Growing Connections is a garden-enhanced nutrition education curriculum for youth that includes:

planning and planting a garden,
developing nutrition and cooking skills,
building food security and hunger awareness, and
enhancing food safety and preservation skills.

4-H Growing Connections is designed for youth age 5-18. The curriculum is designed to be used successfully with a mixed age group of youth.

The primary theme emphasized throughout the curriculum is making healthy food choices. The curriculum is divided into five sections: Gardening, Food Safety, Nutrition, Food Security, and Food Preservation. Each section includes objectives, background information for the instructor, planned observations for evaluation, one to three lesson plans to choose from, and a list of supplies needed. The format for each lesson plan is to begin the lesson with an opening circle, present the main activity for the day, prepare a cooking recipe or share a prepared snack, do a group building activity if time permits, and end with a closing circle. Each lesson plan is 1 1/2 to 2 hours long and is designed according to the experiential learning model of active learning, reflection, and application. It is recommended that each student participate in a minimum of six hours of program time.

Growing Minds: Appalachian Sustainable Agriculture (ASAP)

As part of a national farm to school initiative, Growing Minds is the Appalachian Sustainable Agriculture Project’s (ASAP) farm to school program. Growing Minds strives to cultivate mutually beneficial relationships between farms and schools that create dynamic, wellness-focused learning environments for our children. We do this by working with farmers, educators, and communities to serve local food in schools, while expanding opportunities for farm field trips, experiential nutrition education and school gardens. Currently at least one of these four components is being implemented in Buncombe, Haywood, Henderson, Madison, Mitchell and Yancey County, as well as Asheville City Schools.

http://growing-minds.org/
http://growing-minds.org/lessons.php (Lesson Plans)
http://growing-minds.org/research.php (Research)
State Organizations

GEORGIA CONSERVANCY
www.gaconservancy.org

ENVIRONMENTAL EDUCATIONAL ALLIANCE OF GEORGIA
www.eealliance.org

KEEP GEORGIA BEAUTIFUL
www.keepgeorgiabeautiful.org

ENVIRONMENTAL EDUCATION IN GEORGIA
www.eeingeorgia.org

GEORGIA MASTER GARDENER PROGRAM
Marco Fonseca, Coordinator
1109 Experiment St.
Griffin, GA 30224
(770) 228-7243
www.caes.uga.edu/departments/hort/extension/mastergardener/index.html

GEORGIA ORGANICS
P.O. Box 8924
Atlanta, GA 31106
(678) 702-0400, (678) 702-0401
www.georgiaorganics.org

National Organizations

KITCHEN GARDENERS INTERNATIONAL
7 Flintlock Drive
Scarborough, ME 04074
(207) 883-1107
www.kitchengardeners.org

CENTER FOR ECOLITERACY
2522 San Pablo Avenue
Berkeley, CA 94702
(510) 845-4595
www.ecoliteracy.org

NATIONAL GARDENING ASSOCIATION
1100 Dorset Street
South Burlington, VT 05403
(800) 538-7476
www.kidsgardening.com

COMMUNITY FOOD SECURITY COALITION
PO Box 209
Venice, CA 90294
(310) 822-5410
www.foodsecurity.org

CENTER FOR ENVIRONMENTAL EDUCATION AT ANTIOCH NEW ENGLAND INSTITUTE
40 Avon Street
Keene, NH 03431-3516
(603) 355-3251
www.schoolsgogreen.org

SEEDS OF CHANGE: SEED DONATION PROGRAM
(Organic & Heirloom vegetable/flower seeds)
PO Box 15700
Santa Fe, NM 87592
(800) 957-3337 or (800) 762-7333
www.seedsofchange.com
Financial Resources

AMERICA THE BEAUTIFUL FUND
Operation Green Plan, Dept C.
1730 K St NW, Suite 1002
Washington, DC 20006
(202) 638-1649

THE GREEN GUERILLAS
625 Broadway, 9th Floor
New York, NY 10012
(212) 674-8124, (212) 505-8613 (fax)
www.greenguerillas.org

COMMON GROUND GARDEN PROGRAM
USDA Extension Service
South Building, Room 3347
Washington, DC 20250-0900
(202) 720-3513
*donations for servicing needy and neglected urban areas

LILYPONS FOR YOUTH GRANT PROGRAM
Lilypons Water Gardens
PO Box 10
Buckeystown, MD 21717
(301) 874-5503
*match funds for youth to cultivate an aquatic environment

THE FOUNDATION CENTER
1001 Connecticut Ave., NW
Washington, DC 20063
(202) 331-1400

NATIONAL ENVIRONMENTAL EDUCATION AND TRAINING FOUNDATION
www.neetf.org

NATIONAL SCIENCE TEACHERS AWARD PROGRAMS
1742 Connecticut Ave, NW
Washington, DC 20009
(202) 328-5800
*awards for innovative science projects, teaching performance, and plans

NATIONAL ENDOWMENT FOR THE HUMANITIES
Division of Public Programs
Room 426
110 Pennsylvania Ave, NW
Washington, DC 20506
(202) 606-8284

NATIONAL GARDENING ASSOCIATION
Youth Garden Grants
180 Flynn Ave
Burlington, VT 05401
(802) 863-1308, (802) 863-5962 (fax)
www.garden.org

NATIONAL WILDLIFE FOUNDATION
www.nwf.org/schoolyardhabitats

ENVIRONMENTAL PROTECTION AGENCY
www.epa.gov/teachers/grants.htm

SCHOOL GRANTS
www.schoolgrants.org

KIDSGARDENING
School Garden Grants

Resources
Further Research and Readings


Understanding child nutrition & food preferences:


April 18, 2005 from http://www.asfsa.org/childnutrition/jcnm/02fall/morris/.


**Web Resources**

COMMUNITY FOOD SECURITY COALITION
FARM TO SCHOOL PROGRAM:
www.foodsecurity.org/farm_to_school.html

LINKING FARMS WITH SCHOOLS:

HEALTHY FARMS, HEALTHY KIDS:
Evaluating the Barriers and Opportunities for Farm-to-School, available at www.foodsecurity.org/pubs.html

RETHINKING SCHOOL LUNCH
www.ecoliteracy.org/rethinking/rsl.html

FEEDING YOUNG MINDS:
Hands-on Farm to School Education Programs, www.foodsecurity.org/pubs.html

CALIFORNIA DEPARTMENT OF EDUCATION:
A GARDEN IN EVERY SCHOOL
http://www.cde.ca.gov/nsd/nets/g_index.htm

CORNELL COMPOSTING: COMPOSTING IN SCHOOLS.
http://compost.css.cornell.edu/schools.html

EDIBLE SCHOOL YARD, BERKELEY CALIFORNIA
http://www.edibleschoolyard.org

FRIENDS OF BURLINGTON GARDENS
http://www.burlingtongardens.org

GARDENING LAUNCH PAD
http://gardeninglaunchpad.com/kids.html

A huge page of curriculum and activity links
TEXAS A&M UNIVERSITY  
http://aggie-horticulture.tamu.edu  
Includes many resources from research projects involving garden-based learning, to practical tips and curriculum for working with youth.

MICHIGAN 4-H CHILD’S GARDEN  
http://4hgarden.msu.edu/main.html

NATIONAL GARDENING ASSOCIATION  
http://www.garden.org  
http://kidsgardening.com  
Lists of youth garden grant opportunities and a kid’s gardening page.

UNIVERSITY OF CALIFORNIA SCHOOL GARDENS  
http://commserv.ucdavis.edu/CESanDiego/Schlgrdn/HomePage.html

UNIVERSITY OF CALIFORNIA CENTER FOR YOUTH DEVELOPMENT  
http://fourhcyd.ucdavis.edu  
Includes a research paper on the history and educational implications of garden-based learning.

UNIVERSITY OF FLORIDA AGRICULTURAL EXTENSION SCHOOL GARDENS  
http://hort.ifas.ufl.edu/ggk/schgard.htm
Appendix A: Vocabulary

**Agriculture** – The Science, art and business of farming

**Community-Supported Agriculture (CSA)** – An agreement between a farmer and community members who purchase “shares” of seasonal crops to ensure continual income for the farmer.

**Dietary Guidelines** – Recommendations for improving health through food and activity.

**Farmer’s Market** – Usually an open-air market where farmers sell their wares directly to the consumer.

**Farming, organic** – The practice of growing food or raising animals by guidelines that emphasize avoiding synthetic chemical inputs and working the soil to create conditions favorable to plants and soil organisms.

**Food Chain** – A “chain” starting with the sun (captured by green plants) and followed in turn by who eats whom next – for example, sunlight is converted by green plant, which is eaten by mouse, which in turn is eaten by fox.

**Food Pyramid** – A visual representation showing one person’s daily recommended food choices and portions from the various food groups.

**Food Security** – People who are “food secure” do not feel vulnerable about where their next meal is coming from. Community food security means “all persons obtaining at all times a culturally acceptable nutritionally adequate diet through local non-emergency sources.” (Community Food Security Coalition)

**Food Supply** – The quality and quantity of the food that we need to survive and thrive.

**Food Web** – A complex, interlocking of food chains within an ecological community, includes more complex relationships than a linear food chain.

**Germinate/germination** – The process of a seed becoming a plant.
Hunger - A lack of food which can lead to death.

Legumes – Plants such as peas and beans with the ability to take in nitrogen through their roots’ also called “nitrogen fixing” plants.

Natural food – Food that does not contain artificial ingredients or preservatives, often to refer to non-processed, whole food.

Nutrition – The study of how food is used by a living organism.

Processed food – Food that has been altered from its whole, natural state.

Sustainable Agriculture – A farming system that conserves resources, is socially supportive, commercially competitive and environmentally sound.

Theme garden – A garden based on a specific concept or subject, i.e., Vegetable Soup or a pizza garden.

Vermicompost – A mixture of vermicastings and rotted organic matter.
## Appendix B: Charts

### AN OUTDOOR PLANTING GUIDE FOR GEORGIA

<table>
<thead>
<tr>
<th>Crop</th>
<th>Days to Maturity</th>
<th>Spring Planting Dates</th>
<th>Fall Planting Dates</th>
<th>Seed/Plants 100 ft</th>
<th>Distance Between Rows</th>
<th>Distance Between Plants</th>
<th>Depth to Plant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asparagus</td>
<td>2nd season</td>
<td>Jan 15-Mar 15</td>
<td>Nov &amp; Dec</td>
<td>50 roots</td>
<td>3 to 5 ft</td>
<td>1 1/2 to 2 ft</td>
<td>6 in</td>
</tr>
<tr>
<td>Bean, bush</td>
<td>50-60</td>
<td>Apr 1-May 1</td>
<td>July 15-Aug 20</td>
<td>1/2 lb.</td>
<td>3 ft</td>
<td>2 to 4 in</td>
<td>1-1 1/2 in</td>
</tr>
<tr>
<td>Bean, pole</td>
<td>65-75</td>
<td>Apr 1-May 1</td>
<td>July 15-Aug 10</td>
<td>1/2 lb.</td>
<td>3 ft</td>
<td>6 to 12 in</td>
<td>1-1 1/2 in</td>
</tr>
<tr>
<td>Bean, lima</td>
<td>65-75</td>
<td>Apr 1-June 1</td>
<td>July 1-Aug 1</td>
<td>1 lb.</td>
<td>2 to 2 1/2 ft</td>
<td>3 to 4 in</td>
<td>1-1 1/2 in</td>
</tr>
<tr>
<td>Beet</td>
<td>55-65</td>
<td>Feb 15-Apr 1</td>
<td>Aug 1-Sept 20</td>
<td>1 oz.</td>
<td>2 to 2 1/2 ft</td>
<td>2 in</td>
<td>1 in</td>
</tr>
<tr>
<td>Broccoli</td>
<td>60-80</td>
<td>Feb 15-Mar 15</td>
<td>Aug 1-Sept 1</td>
<td>100 plants</td>
<td>2 1/2 ft</td>
<td>14 to 18 in</td>
<td></td>
</tr>
<tr>
<td>Cabbage</td>
<td>65-80</td>
<td>Jan 15-Mar 15</td>
<td>Aug 15-Oct 1</td>
<td>100 plants</td>
<td>2 1/2 ft</td>
<td>12 in</td>
<td></td>
</tr>
<tr>
<td>Cantaloupe</td>
<td>80-90</td>
<td>Mar 25-Apr 20</td>
<td>Not recommended</td>
<td>1 oz.</td>
<td>4 to 6 ft</td>
<td>3 1/2 to 4 ft</td>
<td>1 1/2 in</td>
</tr>
<tr>
<td>Carrot</td>
<td>70-80</td>
<td>Jan 15-Mar 20</td>
<td>Aug 20-Sept 15</td>
<td>1/4 lb.</td>
<td>3 to 3 1/2 ft</td>
<td>12 to 18 in</td>
<td>3/2 in</td>
</tr>
<tr>
<td>Cauliflower</td>
<td>55-60</td>
<td>Mar 1-Apr 1</td>
<td>Aug 1-Sept 1</td>
<td>100 plants</td>
<td>3 ft</td>
<td>12 to 18 in</td>
<td></td>
</tr>
<tr>
<td>Collard</td>
<td>55-70</td>
<td>Feb 1-Mar 20</td>
<td>Aug 1-Oct 1</td>
<td>1/2 oz.</td>
<td>2 1/2 ft</td>
<td>8 to 16 in</td>
<td>3/2 in</td>
</tr>
<tr>
<td>Corn</td>
<td>80-100</td>
<td>Mar 15-June 1</td>
<td>June 1-July 20</td>
<td>1/4 lb.</td>
<td>3 to 3 1/2 ft</td>
<td>12 to 18 in</td>
<td>2 in</td>
</tr>
<tr>
<td>Cucumber</td>
<td>60-65</td>
<td>Apr 1-May 15</td>
<td>Aug 20-Sept 1</td>
<td>1 oz.</td>
<td>3 1/2 to 5 ft</td>
<td>3 to 4 ft</td>
<td>1 1/2 in</td>
</tr>
<tr>
<td>Eggplant</td>
<td>75-90</td>
<td>Apr 1-May 15</td>
<td>July 10-15</td>
<td>50 plants</td>
<td>3 ft</td>
<td>2 1/2 to 3 ft</td>
<td></td>
</tr>
<tr>
<td>Kale</td>
<td>50-70</td>
<td>Feb 1-Mar 10</td>
<td>Aug 10-30</td>
<td>1/2 oz.</td>
<td>3 ft</td>
<td>10 in</td>
<td>3/2 in</td>
</tr>
<tr>
<td>Lettuce</td>
<td>60-85</td>
<td>Jan 15-Mar 15</td>
<td>Sept 1-Oct 1</td>
<td>1/2 oz.</td>
<td>2 to 2 1/2 ft</td>
<td>10 to 12 in</td>
<td>3/2 in</td>
</tr>
<tr>
<td>Mustard</td>
<td>40-50</td>
<td>Jan 15-Apr 1</td>
<td>Aug 20-Oct 1</td>
<td>1/2 oz.</td>
<td>2 ft</td>
<td>1 in</td>
<td>3/2 in</td>
</tr>
<tr>
<td>Okra</td>
<td>55-60</td>
<td>Apr 1-June 1</td>
<td>June 15-July 1</td>
<td>1 oz.</td>
<td>3 to 3 1/2 ft</td>
<td>6 in</td>
<td>1 in</td>
</tr>
<tr>
<td>Onion (mature)</td>
<td>100-120</td>
<td>Jan 1-Mar 15</td>
<td>Sept 1-Dec 31</td>
<td>300 plants or 1/2 gal sets</td>
<td>1 to 2 ft</td>
<td>3 to 4 in</td>
<td>3/4 in</td>
</tr>
<tr>
<td>Peas, garden</td>
<td>60-80</td>
<td>Jan 15-Feb 15</td>
<td>Not recommended</td>
<td>1 lb.</td>
<td>2 1/2 ft</td>
<td>1 in</td>
<td>1 1/2 - 2 in</td>
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<td>Peas, southern</td>
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<td>Apr 1-Aug 1</td>
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<td>Pepper</td>
<td>65-80</td>
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<td>Potato, Irish</td>
<td>70-90</td>
<td>Jan 15-Mar 1</td>
<td>Aug 1-15</td>
<td>1 peck</td>
<td>2 1/2 to 3 ft</td>
<td>10 to 14 in</td>
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<td>Potato, sweet</td>
<td>90-150</td>
<td>Apr 15-June 15</td>
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<td>100 plants</td>
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<td>Radish</td>
<td>25-30</td>
<td>Jan 15-Apr 1</td>
<td>Sept 1-Oct 15</td>
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<tr>
<td>Spinach</td>
<td>40-45</td>
<td>Jan 15-Mar 15</td>
<td>Sept 1-Oct 15</td>
<td>1 oz.</td>
<td>1 1/2 to 2 ft</td>
<td>1 to 2 in</td>
<td>3/4 in</td>
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<td>50-55</td>
<td>Apr 1-May 15</td>
<td>Aug 1-20</td>
<td>1 oz.</td>
<td>3 to 4 ft</td>
<td>2 ft</td>
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<td>Squash, winter</td>
<td>85-90</td>
<td>Apr 1-Aug 1</td>
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<td>1/2 oz.</td>
<td>5 ft</td>
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<td>Tomato</td>
<td>70-85</td>
<td>Mar 25-May 1</td>
<td>June 1-Aug 10</td>
<td>50 plants</td>
<td>3 to 4 ft</td>
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<tr>
<td>Turnip</td>
<td>45-65</td>
<td>Jan 15-Apr 1</td>
<td>Aug 10-Sept 15</td>
<td>1/2 oz.</td>
<td>1 to 2 ft</td>
<td>1 to 2 in</td>
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<tr>
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<td>Mar 20-May 1</td>
<td>Do not plant</td>
<td>1 oz.</td>
<td>10 ft</td>
<td>8 to 10 ft</td>
<td>1 1/2 in</td>
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*Note: Planting dates in this chart are for middle Georgia. North Georgia plantings should vary about two weeks later in the spring and earlier in the fall. South Georgia plantings can be made two weeks earlier in the spring and somewhat later in the fall. Information in this chart comes from Bulletin 577 of the Cooperative Extension Service of the University of Georgia College of Agriculture and Environmental Sciences.

**COMPANION PLANTING CHART FOR HOME & MARKET GARDENING* **

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<tr>
<th>Crop:</th>
<th>Companion with:</th>
<th>Incompatible with:</th>
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<td>Asparagus</td>
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<td>Onion, beets, kolhrabi, sunflower</td>
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<td>Beets, carrot, lettuce, cabbage family, summer savory</td>
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<td>Nasturtium, corn, marigold</td>
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<td>Turnip</td>
<td>English pea</td>
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* (compiled from traditional literature on companion planting) Planting: Basic Concept and Resources by George Kuepper & Mardi Dodson, NCAT Agriculture Specialist and Project Intern, July 2001, ATTRA Publication #IP125/71
Eating local means eating seasonal. This harvest calendar reflects the diverse array of sustainable produce available from local farms during peak season and season extension periods. The calendar was produced by local farmers for Georgia Organics, a nonprofit organization integrating healthy, sustainable and locally grown food into the lives of Georgians. Join us today. For more information, visit www.georgiaorganics.org.

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<th>Jun</th>
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- **Peak Harvest**
- **Season Extension**
Appendix C: Successful Grant Proposal

Below is the initial grant application written by Ellen Walker that started the educational garden at Alps Road Elementary School. Walker has since modified this proposal to seek additional grants to maintain and grow the garden at Alps Road. Based on the grant she is applying for, she updates her information, provides pictures and her success stories in the garden, and tailors everything to new grant specifications.

Alps Road First Grade Raised Bed Gardens
Grant Amount Request - $1,000.00
Number of students to be served – 68

This project is to construct and maintain 4 raised bed gardens outside the first grade wing of Alps Road Elementary School. We will construct the beds of untreated red cedar boards; fill them with layers of composted materials such as shredded newspapers, composted manure, shredded leaves, grass clippings, peat moss, top soil and composted kitchen waste. The children will plant thematic gardens in each of the beds and tend, water and weed the beds throughout the year. Lessons in all of the subject areas listed below will tie into the gardens (see detail on Behavioral Objectives page).

The benefits of gardening for children include the following:*  
• RESPONSIBILITY - from caring for and tending plants.
• UNDERSTANDING - as they learn about cause and effect (for example, plants die without water, weeds compete with plants etc).
• SELF CONFIDENCE - from achieving their goals and enjoying the food they have grown.
• LOVE OF NATURE - a chance to learn about the outdoor environment in a safe and pleasant place.
• REASONING AND DISCOVERY - as they learn about science, botany, nutrition and simple construction.
• PHYSICAL ACTIVITY - that is fun and productive.
• COOPERATION - including shared play activity and teamwork.
• CREATIVITY - finding new and exciting ways to grow food.
• NUTRITION - learning about sources of fresh food.

OpenDocument
This project will also tie directly into the current CCSD student wellness initiative to encourage children to eat nutritious foods, be more active, and live healthier lives. With the increased incidence of childhood obesity, these gardens will contribute to the student’s greater awareness of a healthy diet and allow them to participate in a physical activity that has long term benefits.

Subject area in which project will be used:
- Language Arts
- Math
- Writing
- Social Studies
- Science

(See specific standards and elements under Behavioral Objectives.)

RATIONALE FOR PROJECT

Research has shown that children, especially from lower socio-economic groups, benefit tremendously from the type of interactive, creative, problem solving activities that community gardens can provide. Many of the students in our county lack the opportunity to plant, tend and nurture flowers, herbs, and vegetables. Most first grade students do not have a concrete understanding of the fact that food is, in large part, produced by farmers who must plant, tend, harvest, and then distribute, the produce. Nor do they have sufficient opportunities to work on an on-going project that could directly result in improving their physical health. These gardens will be an excellent opportunity for the children of Alps Road Elementary to have a hands-on experience that will tie into the curriculum in every subject area as well as promote a healthier diet and provide physical activity.

Each of the 4 raised beds will be thematic in nature and may include one or more of the following: an Alphabet Garden (planting things from A – Z), a Pizza Garden (planting those things that one would put on a pizza, excluding the cheese), a Chef Salad garden (planting those things that one would find in a large, mixed green salad), herbs, etc.

We will also introduce the students to the idea of recycling in the form of composting. We plan on creating the gardens based on the book Lasagna Gardening, by Patricia Lanza, who advocates using composted materials as the layers for the substrata in a garden such as shredded newspapers, composted manure, shredded leaves, coffee grounds and other organic kitchen waste, hay, etc. We will also have a compost bin and encourage the school kitchen to recycle clean, non-animal matter waste in our compost
bin. We will purchase worms and teach the children how they function in a garden and why they are essential to good, productive “soil.”

We are fortunate to live in a climate where year-round gardening is possible. We will be able to work in the gardens throughout the entire school year and tie the activities into the curriculum along the way. Children also love to plant things that grow and produce quickly. We will be certain that the gardens are planted so that there is always something sprouting, blooming or producing throughout the year.

BEHAVIORAL OBJECTIVES

As a result of this project we anticipate that the students will achieve the following behavioral objectives:

SCIENCE-LIVING THINGS

• S1CS2d. Students will make “maps” of the area for the garden beds, measuring out 1’ squares for planting, deciding how many different plants can be placed in each bed.
• S1CS3a. Use ordinary hand tools and instruments to construct, measure, and look at objects.
• S1CS5a-c. Describe and compare the produce of the gardens, measure, weigh, make graphs to show data.
• S1L1a. Identify the basic needs of a plant.
• S1L1c. Identify the parts of a plant

SOCIAL STUDIES-PRODUCERS AND CONSUMERS

• SS1E1. Students will identify that a large part of the goods that they and their families consume is in the form of food and that food is produced and provided by others.
• SS1E3. Students will describe how they are primarily consumers of food but by gardening they can also become producers.
• SS1E3. Students will understand that by growing some of the food that they consume, they can benefit from saving on food, allowing them to have funds for spending on other needs.

MATH-MEASUREMENT, DATA ANALYSIS, PROCESS SKILLS

• M1M1a-c. Students will measure the raised beds to divide them into 10 equal squares. They will weigh and measure the length or girth of the produce and compare.
• M1D1. Students will create tables and graphs of the seeds and plants and the produce harvested.
• M1P1a-d. Students will solve word problems related to the area of the gardens, the number of crops each bed can hold, the productivity of the garden, etc.

LANGUAGE ARTS-

READING-VOCABULARY AND COMPREHENSION

• ELA1R5a. Students will have “garden” centers during reading time, where they will explore a variety of grade level texts about plants and gardening.
• ELA1R6a, b, e, f, g, h, j, k. Students will use a variety of texts and demonstrate comprehension through summaries, projects, and illustrations to retell what they have learned about plants and gardening.

WRITING

• ELA1W1a-m. Students will keep a garden journal to describe activities, events, and observations about the gardens, using the standards and elements necessary to produce a polished report at the end of the school year on a topic selected from among their writings.

Appendix
IV. PROJECT IMPLEMENTATION AND BUDGETARY NEEDS

IMPLEMENTATION:

• Obtain the cedar boards for the boxes from Lowes and have them delivered by January.
• Enlist help from parents and community members to help construct the boxes, including a compost box, by the end of January.
• Have the materials for the layered growing materials delivered by early February.
• Begin planting seeds and plants by late February or early March.

BUDGETARY NEEDS

<table>
<thead>
<tr>
<th>BUDGETARY NEEDS: TEACHER RESOURCES</th>
<th></th>
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<tbody>
<tr>
<td>Your Backyard Herb Garden, Miranda Smith</td>
<td>$12.21</td>
</tr>
<tr>
<td>Southeast Smart Garden Regional Guide, American Horticultural Society</td>
<td>$19.80</td>
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<tr>
<td>Square Foot Gardening, Mel Bartholomew</td>
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<td>Lasagna Gardening, Patricia Lanza</td>
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<td>Gardening with Children, Beth Richardson</td>
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<td>Roots, Shoots, Buckets and Boots: Gardening Together with Children, Sharon Lovejoy</td>
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<td>Kid’s Gardening, Kevin Raftery</td>
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<td>Wally’s Big Book of Gardening, Susanne Tommes</td>
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<td>Green and Growing: A Book About Plants, Susan Blackaby</td>
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<table>
<thead>
<tr>
<th>BUDGETARY NEEDS: CHILDREN’S BOOKS</th>
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<tbody>
<tr>
<td>Pumpkin Circle: The Story of a Garden, George Levenson – 10 copies @ $7.95 each</td>
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## Budgetary Needs: Children’s Books

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<th>Quantity</th>
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<tr>
<td>From Seed to Plant, Gail Gibbons – 10 copies @</td>
<td></td>
<td>$6.95 each</td>
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<tr>
<td>How a Seeds Grow, Helene Jordan</td>
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<td>The Tiny Seed, Eric Carle</td>
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<tr>
<td>Jack’s Garden, Henry Cole – 10 copies @ $6.99 each</td>
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<td>A Seed Grows, Pamela Hickman</td>
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<td>What is a Plant?, Bobbie Kalman</td>
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<td>In the Garden, Ballimard-Jeunesse, Heliadore</td>
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<td>Worms Eat My Garbage, Mary Appelhof</td>
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## Budgetary Needs: Supplies for 3’W x 10’L x 18”H Raised Garden Bed and Compost Box Materials

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<th>Item</th>
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<tr>
<td>Untreated cedar boards – 36) 1” x 6” x 10’ @ $7.99/board</td>
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<td>Untreated cedar posts – 10) 1” x 2” x 8’ @ $2.95/board</td>
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<td>Landscape cloth – 2 rolls @ $7.97 each</td>
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## Budgetary Needs: Tools

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<tr>
<td>Trowels – 10</td>
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<td>$3.94 each</td>
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<tr>
<td>Hand rake – 10</td>
<td></td>
<td>$3.94 each</td>
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<tr>
<td>Spade – 2</td>
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<tr>
<td>Rake – 2</td>
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<td>Bucket – 4</td>
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Appendix
## Budgetary Needs: Tools

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<th>Item</th>
<th>Cost</th>
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<tr>
<td>Worms - $34.00/2 pound</td>
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<td>Seeds and Plants</td>
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<td><strong>Total:</strong></td>
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## Budgetary Needs

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<th>Item</th>
<th>Cost</th>
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<tr>
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<td>Children’s Books Total:</td>
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<tr>
<td>Bed Supplies Total:</td>
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<td>Tools Total:</td>
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<tr>
<td><strong>Grand Total:</strong></td>
<td><strong>$995.75</strong></td>
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Planting Medium:

Since we plan on having a composted, lasagna-layered garden, I hope to have the various planting medium donated.
Appendix D: An Easy Illustrated Design Method of Garden Planning

1. CHOOSE THE SITE

- evaluate area
- consider accessibility
- note existing features and garden components
- sun exposure, winds,

- open lawn
- large oaks
- tennis courts
- sidewalks
- hallfields
- azaleas

W
N
E
S

lunch room
play area
lunch
School
2 Plaza

parking

Appendix
2. PLAN IT OUT

- Draw a plan of the site
- Determine sun and shade areas
- Brainstorm ideas for garden design
- Determine movement through use of site
- Loosely define boundaries, edges, and different arrangements

- Herbs
- Mini-orchard
- Vegetable shed
- Sunflower patch
- Butterfly garden
- Beneficial insect houses
- Shade
- Compost bins
- Classroom area
- Fountain
- Winding paths

SUN
2. DESIGN & BUILD

- Integrated Strongest Ideas
- Create Final Plan
- Create Plant List
- Start Digging
- Needed: Create Plant List

HELPFUL RESOURCES:
- w. KidsGardening.org
- w. 4H/3-H/4-H.org
- w. RainTrees.com
- w. KidsGarden.org
- w. Madison - L2
- w. 4H/3-H/4-H.org
- w. KidsGarden.org

SUGGESTIONS:
- Mini-orchard
- Raised beds
- Garden bench
- Bird bath
- Shade plants
- Table seating
- Terrace
- Benches
- Rain garden
- Compost
- Shed

AUGMENT VIEWS:
- w. Aggie Horticulture
- KidsGarden
- Nature Center


