WEBSTER UNIVERSITY

School of Education Graduate Program

HOW DO COMMUNITY GARDENS IMPACT SOCIAL CONDITIONS?

Cultivating St. Louis

BY

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WHAT ARE COMMUNITY GARDENS?

Community gardens are simply plots of land cultivated by a group of people to produce food and beautify an area. They can take on many forms: urban or rural, abandoned city lots or untended farmland, with sweeping berms or lumber raised beds, native perennial borders or striking annual accents; long rows of communally worked vegetable beds to grow food for those in need or small family plots cramped closely together to accommodate as many as possible. One thing that all community gardens have in common is that the central focus is most often not plants, but people.

> *"We live in a world that has practiced violence for generations—violence to other creatures, violence to the planet, violence to ourselves. Yet in my garden, where I have nurtured a healthy soil-plant community, I see a model of a highly successful non-violent system where I participate in gentle biological diplomacy rather than war. The garden has more to teach us than just how to grow food."*
>
> --Eliot Coleman, *Four Season Harvest: Organic Vegetables from Your Home Garden All Year Long*, 1999.

HISTORY

Community gardening has deep roots in the United States, dating back to the height of the Industrial Age during the late 1800s when urban gardens began to appear in Detroit. These spaces were promoted by social and educational reformers as a way to provide land and technical assistance to unemployed workers in large cities and to teach civics and good work habits to youth. (MU Extension, *Community Gardening Toolkit,* http://extension.missouri.edu/publications/DisplayPub.aspx?P=MP906-4#history)

In 1919, the Bureau of Education, Department of the Interior created the United States School Garden Army with the motto, "A garden for every child, every child in a

garden." According to their manual, “The aim of this army is to nationalize and unify the great work now being carried on among the school children of America.” Gardens, tended by both youth and adults were considered a matter of national security. Food shortages were a concern and, as echoed in WWII, rations were instituted so that ample food could be provided for soldiers fighting overseas. Community gardens were used to supplement the United States domestic food supply, and fully supported by the government and undertaken by individuals to grow food not only for themselves, but also for shipment to soldiers overseas. During World War II, Victory Gardens were encouraged as a means to boost morale. It was also important during this time for individuals to provide for themselves, as many domestic resources were being used to support soldiers around the world. (Rose Hayden-Smith, *Soldiers of the Soil: A Historical Review of the United States School Garden Army*, “Monograph,” University of CA, Winter 2006)

Few community gardens remained after WWII, during a time of great economic expansion in the United States. Plots were abandoned as new buildings were constructed and the general urban population began to depend on grocery stores for the bulk of their food, which could now be readily refrigerated and quickly heated. It was not until the 1970s, when the economy began to plummet, the cities had been abandoned for the suburbs and environmental concerns were on the rise, that community gardening once again became a desirable mode of social change. There were many vacant lots in urban areas and youth were reaching out to one another to build community with the environment in mind. (H. Patricia Hynes, *A Patch of Eden,* Chelsea Green Publishing Co., 1996, p. xi; Tom Fox, Ian Koeppel, Susan Kellam, *The Struggle For Open Space,* Neighborhood Open Space Coalition, 1985, pp. 3-6.)

The common themes of food production for domestic stability, community beautification, employment and regeneration of blighted urban areas have been threaded throughout the history of community gardening. The current trend in urban community gardening movements is the issue of food security, and spreading awareness of our present food system.

FOOD SECURITY

Mike Hamm and Anne Bellows of the Community Food Security Coalition (CFSC) state that "Community food security is a condition in which all community residents obtain a safe, culturally acceptable, nutritionally adequate diet through a sustainable food system that maximizes community self-reliance and social justice (http://www.foodsecurity.org/views_cfs_faq.html)." According to this definition, by attaining food security, a community becomes culturally aware, equitable and self-reliant. This clearly has healthy food at its core, but also links culture, community and justice to having access to this food. It is thought that there are *food deserts* in every major city, and many rural areas, in the United States. According to the Centers for Disease Control and Prevention (CDC) food deserts are "areas that lack access to affordable fruits, vegetables, whole grains, low-fat milk, and other foods that make up the full range of a healthy diet." Looking at these two definitions, it is clear that food deserts do not have community food security, thus can be termed *food insecure*. Community gardens have been identified as one strategy to improving food security, particularly when access to fresh, healthy and local food is difficult. It has been shown that once people begin to grow their own food, they are more likely to consume fruits and vegetables and adopt healthy lifestyle habits such as exercise (Lackey and Associates, p.33 1998).

In St. Louis, MO there are several organizations that are working toward the goal of improving food security in and around the city limits. With the assistance of Congressman Russ Carnahan's office in 2007, a working group came together to form a Food Policy Council that will eventually determine strategies and advocate for improving food security in St. Louis. The working group grew to include stakeholders, community members, urban gardening representatives, health care workers, educators and food producers that culminated into a Food Policy Council steering committee in 2010 at the Food Summit held on March 4th at St. Louis University. Healthy Youth Partnership (HYP) is a coalition of over 100 local organizations that are working toward these goals, and the host of the St. Louis Food Policy Council.

SOCIAL CONDITIONS

Among the many members of HYP is Gateway Greening, a local nonprofit organization with a mission "to contribute to neighborhood vitality and stability through community food projects, education and wellness programs, and civic greening. (http://www.gatewaygreening.org/about-us/our-mission.html)." Gateway Greening (GGI) has been working with community members to install and support community and youth gardens for 26 years in high-need neighborhoods and schools of St. Louis. In 2000, the University of Missouri—St. Louis' Public Policy Research Center conducted The Whitmire Study to observe change from 1990-2000 of social conditions, "including crime reduction both to property and people, increased property values and improvement of property, improvements in the overall appearance of the neighborhood, and increased feelings of safety" in census tracts surrounding 54 GGI-supported community gardens. The results were astonishing. Even while St. Louis City was experiencing an economic downturn and population loss, it was shown that

areas surrounding community gardens fared better overall than comparable areas of St. Louis. In its conclusion, the Whitmire Study stated: "Ultimately, the areas directly surrounding the gardens have increased the proportion of individuals invested in the vitality of the neighborhood more than the surrounding tracts…gardens are used to strengthen neighborhoods and achieving a strong diverse rental and owner base is critical to neighborhood stability." (http://stlouis.missouri.org/501c/gatewaygreening/new_green/whitmire_study.html).

COMMUNITY BUILDING

The American Community Gardening Association (ACGA) has produced a wealth of resources for those interested in community development through gardening. In their *Growing Communities Curriculum* introduction, a common lesson in this endeavor is described: "ACGA has…learned that offering opportunities for community members to experience themselves and their communities in new and empowering ways provides the seeds for long-lasting change. This is transformation. This is the foundation for community gardening and community building (p. 13)."

St. Louis boasts over 200 community garden projects in the metropolitan area, with that number increasing yearly. Gateway Greening (GGI) was recently an organization focused primarily on providing the physical materials like lumber, soil and tools, to assist neighborhood groups with the start-up of community gardens. Today, citizen groups often find their own materials and build their raised beds themselves before even coming to Gateway Greening. They go through the rigorous grant process, not to receive funds or materials, but simply to become a "partner" of GGI to qualify for educational trainings and community leadership classes.

In January of 2010, GGI offered an intensive 8-week course called Growing Gardeners that would train people, not only in horticulture, but more importantly in how to be an effective community leader. Alongside the soil building and seed starting classes, trainings by professionals were offered in Asset-Based Community Development, advocating for food security to local government officials, and effective methods of intensive vegetable production for the purpose of food distribution throughout St. Louis food deserts. Gateway Greening is answering the call of St. Louis residents who are now looking to the organization for more educational resources and trainings than materials. This trend seems to reflect the growth in popularity of, and need for, community gardens in a city struggling to make ends meet. Community gardening is no longer seen as a hobby, but instead as a means to build a strong and vital community with deep roots, from the ground up, season after season. "By providing a social focus community garden projects have a strong capacity to build community. Their role in reducing food miles by producing food close to home is an important environmental benefit. As part of urban agriculture, community gardens have the potential to integrate food production, organic waste recycling and social equity into our cities" (Milne, 2002 p.3 http://growingourown.wordpress.com/2-literature-review/).

YOUTH AND GARDEN EDUCATION

"Food is essential for our survival. Yet most people never see food before it gets to the grocery store, and primary-aged children may have only vague ideas about where their food comes from. Looking at the food we eat and learning where it comes from are important first steps for exploring the impacts of our food choices on society and the environment."

--*Big Ideas,* Center for Ecoliteracy, 2008

Building strong communities and becoming aware of our environmental and social impacts are components of sustainability. Taking care to ensure a bright future for our environment means mindfully allowing for an education of young people who will make good choices, including adopting a healthy lifestyle and nurturing the land. With the First Lady, Michelle Obama, emphasizing healthy foods in schools and teaching youth to garden, the concept of school gardens has gained momentum around the country. In St. Louis alone, there was an increase of about 20% in new school gardens in the last two years. Gateway Greening and other gardening organizations were flooded with requests. New governmental agencies focused on supporting Farm to Cafeteria efforts have been formed from the local to national level, and new laws have been passed promoting locally grown foods in school lunches. With this enthusiasm for growing food with kids comes the responsibility to teach meaningful lessons that will stick with young people throughout their lives.

The Yari Yari Writers is a youth literary group formed by Debra Morrowloving in1997 in her St. Louis neighborhood to promote creativity and nurture an African history often neglected in traditional history books. The Yari Yari Writers were meeting weekly at the Monsanto Family YMCA in the Hamilton Heights neighborhood to work on poetry and art. When they went out in the backyard of the YMCA to enjoy a beautiful day in 2008, they realized that there was a very large community garden that included raised beds, perennials, fruit bushes and trees, and primarily elders growing vegetables. Debra and the Writers decided that this garden could offer an opportunity for them to practice many of the Yari Yari principles, including hard work, helping elders and affirming their interest in the environment. That year, the group planted a butterfly garden and began to hold their meetings among the pollinators. They found that their renewed connection with nature, the butterflies, bees and flowers in

particular, led to some very inspired work. The next spring, the group decided to adopt a vegetable bed and to assist any elders who may want an extra hand. It was not long before they were helping to tend most of the 26 beds! No matter how hot the summer got, they continued to water, weed, and learn the names and tastes of many vegetables. They discovered the burgeoning flavors of fresh raspberries, blackberries and strawberries. The poems began to flow almost as quickly as the pole beans grew. By the fall of 2009, the Yari Yari Writers were fully integrated with the garden. So much so that when they realized the amount of theft that had occurred that year in the vegetable beds, they were very disappointed in their community. When the equinox was near, there was a suggestion to hold a funeral on that date for the garden because hope had been lost. The young writers spoke up, denied that suggestion, and came up with a different idea: a healing ceremony to promote balance in the community and celebrate the autumnal equinox. They worked collectively to write a poem that would adequately express their feelings about the garden theft and their hopefulness for the future of their neighborhood.

DO WE DARE DISTURB THE UNIVERSE?
by The Yari Yari Writers, 2009

go green in protest and support of our mother earth

make this day one we don't forget

sing all the nzuri of our history

soar past the limits of our stratosphere
to teach the knowledge of the young nation
to establish the future of the new world
to reach the ideals of the past

giving the world a crisp attitude

Becoming members of the community garden offered these young people a chance to identify with the natural environment, and surprised them day after day. The learning that took place in the garden became more meaningful and useful to them than much of what they were being taught in their classrooms. They took their newfound knowledge of plants and people and began to apply it to their daily lives. Two of the Yari Yari Writers have since received scholarships based on poems, artwork and essays about their experiences in the garden and how they related to their community.

Youth garden programs can be successful in unexpected ways and can lead to a life-long appreciation of nature and a deep understanding of community. School programs that link curriculum to their gardens have the ability to engage students in creative and experiential ways with subject matters that are traditionally taught primarily from lectures and books. Taking a hands-on approach to learning, and producing something of great value, is known to be more memorable and enjoyable for students. According to the Center for Ecoliteracy, "the greatest impacts on children's knowledge, behavior, and attitudes come from combining hands-on and minds-on experiences, especially in four settings: school gardens, instructional kitchens, lunchrooms, and classrooms (*Smart by Nature: Schooling for Sustainability,* 2009 p. 23)."

HOW DO COMMUNITY GARDENS IMPACT SOCIAL CONDITIONS?

Community gardens have been positively impacting social conditions since their conception. They once offered those in coal-soaked communities a respite from industry, and an opportunity to relax. (MU Extension, *History of community gardening: The Benefits of Community Gardening)* During war time, gardens became a way for

those at home to support their country by adding to the domestic food supply, thereby allowing for more rations to feed the soldiers overseas. Victory gardens were a source a pride for communities. During times of economic decline and depression community gardens have been a source of food for the hungry and companionship for the lonely. In our increasingly urban society, community gardens allow for a hands-on education of where and how food is produced. As obesity rates skyrocket for both young and old, these gardens are a source of healthy, fresh and highly nutritious food and exercise. Crowded cities constructed of concrete and plastic once again have community gardens woven throughout to provide urban residents a way to reconnect with nature, and to remember the benefits of protecting our precious green spaces. Youth in gardens are learning to appreciate and better understand nature, and nurture the environment for future generations. They are developing healthy lifestyle habits that will in turn be passed down to the next generation. Growing food communally no longer carries the stigma of poverty, but now is a badge of living a sustainable, good life.

Appendix

Examples of K-12 Garden-Based Lessons

I: SEEDS OF KNOWLEDGE

Seedballs!

Subject: Science, History, Nutrition
Garden knowledge level: Basic
Time Period: Late fall or winter

Objective:
To learn about basic plant needs, native plants, and early agricultural techniques.

Background:
Long before we began to market and sell seeds in packets, people found creative and useful ways to preserve their precious seeds throughout the winter. They simulated miniature ecosystems within balls of clay!
A seedball is composed of the various nutrient components needed in order to sprout seeds: clay and compost. Just as young people need specific nutrients to grow strong and healthy, so do plants.
Native plants are ones that grow naturally in your local habitat, and are necessary for a sustainable ecosystem. Be sure to ask a nursery or staff of Gateway Greening which wildflower seeds are native to this area.

Materials:

- About 5 lbs powdered red clay, commonly used for pottery and can typically be found at art supply stores for less than $5.
- About 5 lbs compost, free at City of St. Louis compost pick-up sites
- Native wildflower seeds, free or very low cost from Gateway Greening, Inc.
- A bucket or container for mixing materials
- Water, just enough to moisten your clay and compost
- Screen material or butcher paper for drying the seedballs

Procedure:

1. Present your materials to the class and ask what they think they are for. Begin a discussion about the nutrients in clay and compost and how they act like food for plants, especially young ones. Draw comparisons between healthy foods for humans and plants.

2. Explain how seeds need to be preserved from when they are collected until their next appropriate growing season. Discuss ways to do so with your students.
3. Define what a native plant is and give some popular examples, such as Black-Eyed Susans, Coneflower, and Goldenrod. Provide pictures.
4. Make a large circle with the class around tables or on the floor. Put newspaper or a tarp down on your work area as this can get a bit messy.
5. Begin making seedballs by mixing equal parts compost and clay in a container (clear plastic works very well for visual aid). You may want to pass the container around the room so each student can mix.
6. When the clay and compost are well mixed, add in your seeds. Be sure to add enough so they are thickly distributed within the mixture.
7. Add just enough water to moisten your mixture so you can work it into small balls.
8. Let each student make a few seedballs by rolling them in their hands until they are round.
9. Place the seedballs on a screen or butcher paper to dry for at least a few days.
10. When they are fully dried the seedballs can be preserved for months in a cool, dark place.

Follow up:
In early spring, take your class to a nearby barren spot to toss the seedballs. Visit periodically to observe that once unattractive area become full of vibrant color and native pollinators!

Extension:
Have your students keep an observation journal using scrap paper. Visit your wildflowers once a week to document changes and other visitors, such as butterflies, birds and bees. In the fall, collect seeds from your wildflowers and repeat the experiment with next year's class!

Nutrition and Diet Quiz

Here is a fun quiz to use with young students when discussing health and nutrition. Follow up with a tasting of delicious fruits and veggies!

1. This word starts with an "F." It is the name of a type of food that is good for you. It grows on trees and other plants and usually contains seeds. Many are sweet. What are they? _____

2. This type of food starts with a "V." They grow on plants and are rich in vitamins and minerals, but are low in calories. What are they? _____

3. This word starts with a "B." It is the name of a meal that you eat in the morning. It gives you the energy to start your day. What is it? _____

4. This food starts with a "B." It is a green vegetable that is very good for you. What is it? _____

5. This food starts with a "B." It is a starchy food that you can use to make sandwiches. What is it? _____

6. This food starts with a "C." It is a sweet food that contains mostly sugar. It is low in nutrition and is bad for your teeth. What is it? _____

7. This food starts with a "C." It is a high-protein food that is made from milk. Sometimes you eat it with macaroni. What is it? _____

8. This food starts with a "C." It is a vegetable that grows underground and is high in vitamins that are good for your eyes and skin. What is it? _____

9. This food starts with a "J." It is made by squeezing the liquid from fruits or vegetables. What is it? _____

10. Can you name 3 fruits that start with "P"? _____ _____ _____

11. This food starts with a "P." It is made from bread dough, tomato sauce and cheese. What is it? _____

12. This vegetable starts with a "P." It contains many vitamins and minerals. French fries are made from it. What is it? _____

13. This fruit starts with an "O." It is high in vitamin C and other healthy nutrients. What is it? _____

14. This food starts with an "E." It is high in protein and comes from an animal. What is it? _____

15. This food starts with an "R." It is made by drying grapes. What is it? _____

Answers: 1.Fruit 2.Vegetable 3.Breakfast 4.Broccoli 5.Bread 6.Candy 7.Cheese 8.Carrot 9.Juice 10.Pear, Peach, Pineapple, and any other that you can think of! 11. Pizza 12.Potato 13.Orange 14.Egg 15.Raisin

II: GROWING WITH THE GARDEN

Garden Geometry

Subject: Science, Math
Grade: 5-8
Brief Description:
Students create a geometric-shaped vegetable or herb garden.

Objectives:
Students will

- identify geometric shapes,
- draw geometric designs for the gardens,
- create life-size geometric patterns for the garden,
- plant seeds in the patterns and monitor the plants' growth

Materials:

- pictures or examples of geometric shapes
- pictures of gardens from gardening magazines or books
- a small area of land ready for planting
- yardstick or measuring tape
- drawing or construction paper
- newspaper
- clear or masking tape
- markers, crayons, pens, or pencils
- scissors
- teacher- and/or student-selected vegetable and herb seeds
- several weights to hold down large newspaper patterns (for example, books or rocks, etc.)
- thin rope or twine
- gardening tools
- plant markers, such as popsicle sticks
- water

Complete this activity in several lessons, each approximately one hour long.

Lesson 1

- Ask students to identify geometric shapes from pictures or actual objects.
- Show students pictures of gardens from gardening magazines or books. Ask students to name the shapes within the gardens.
- Reveal to the students that they are going to design and plant a garden shaped in geometric patterns.

- Take the class outside to the area designated for the garden. Ask students to guess the size of the area.
- Using a yardstick or measuring tape, measure the area. Determine which guesstimate was closest to the actual size.

Lesson 2

- Divide the class into small groups. Distribute drawing or construction paper.
- Remind the students of the shape and size of the garden area.
- Distribute to each group a chart of intensive vegetable spacing needs and seasons for each.
- Ask each group to create a design for the garden using a variety of geometric shapes.
- When everyone has finished, have each group present its design to the class. Let the students vote on the design for the garden. (Depending on the size of the plot, you may want to use more than one design.)

Lesson 3

- Discuss the size of the garden. Ask students how large each shape in the design should be to fit the garden.
- Have students tape together newspaper; they will use the newspaper to create a life-size pattern for each shape. Let students measure and draw each shape using markers and a measuring tape or yardstick. For a circle, show students how to measure and draw the diameter of a circle. Have students cut out the patterns.
- Show students the packets of seeds. Decide which seeds to plant in the garden. Discuss the spacing needs and which seeds to use in each shape.

Lesson 4

- In the garden plot, have students lay out the patterns. Put books, rocks, or other heavy objects on the patterns to hold them to the ground.
- Let students use rope to trace the outline of each pattern shape on the ground.
- Hand out gardening tools for students to use in planting the seeds inside the shapes. Write the name of each on a plant marker and place it in the appropriate section. Water thoroughly.
- Have students monitor the growth of the seeds. Watch the plants emerge in the shapes!

This lesson was adapted from:

Education World, Submitted by Lois Lewis

National Standards

Science: NS.K-4.1, NS.K-4.3, NS.K-4.4, NS.5-8.1, NS.5-8.3, NS.5-8.4

Mathematics: NM.K-4.10

III: HARVESTING YOUR KNOWLEDGE

TIME FOR LUNCH: Speak Out for School Food!

Part One: Lead a whole-group discussion on students' feelings towards their current school lunch. Chart all responses so they can reference their ideas later for letter writing. Older students can take their own notes or meet in small groups if preferred.

Sample Questions for Discussion:
1) What do you think of the food served at your school? Is it healthy? Does it taste good? Is it fresh?
2) What can you buy with $1? Can you buy a healthy lunch?
3) If you could change something specific about the food at your school, what would you change?
4) If the food at school were improved, how could it change your life?

Part Two: Discuss how the government decides what food will be served through the Child Nutrition Act. Explain that legislators are able to change the current Child Nutrition Act.

Who decides on what is served at my school?
The United States Congress defines and votes on the Child Nutrition Act which determines how much money is spent on lunch at schools across the country. It also influences what type of food is served and where that food comes from. School district administrators follow the guidelines decided by congress on which food to purchase for your school, and are given funds by congress to do this.

Part Three: Have each child write a letter to a legislator. Have them include the details charted in Part One.

How can I make a difference?
Your opinion matters! Legislators (people in the government involved in making and passing laws) want to know what is important to the people they represent, like you. Legislators especially like to hear from young people. As few as ten letters or phone calls can make a big difference in what they pass.
Find out who your Representative and your Senators are at **www.congress.org**.

What should I write in a letter?
- Say your name, age, where you live and what school you go to.
- Explain why healthy food is important; give examples of your favorite healthy foods.
- Feel free to draw pictures or include photos.
- Thank them for the time they took to read your letter.

Part Four: Have each child address an envelope to one of their legislators **OR** collect all the letters and mail them together. To avoid security delays and make sure the letters arrive on time, send them to the legislators' local offices in your area (not to Washington D.C., where letters have to go through a lengthy screening process).

Lesson plan adapted from Slow Food USA:
http://www.slowfoodusa.org/downloads/campaigns/time_for_lunch-lessonplan.pdf

Author's note:

These lessons are intended as examples of various ways to incorporate gardening into K-12 curriculum. As evidenced by work done in over 70 schools and youth programs in St. Louis (http://www.gatewaygreening.org/our-programs/youth-programs/) and thousands nationwide, gardening can be an effective tool to teach academics, health and community building with youth. There are myriad school gardening resources available to educators for free through websites such as www.kidsgardening.org and www.farmtoschool.org, and easily accessible books to be borrowed from libraries and local nonprofits such as Gateway Greening.

Included below is a rubric designed by the author to assist teachers with an assessment of interdisciplinary garden-based curriculum.

Garden-Based Interdisciplinary Learning Assessment Rubric—Ages 7 and up

CATEGORY	8	6	4	2	0
Conceptual Awareness	Quickly makes connections between topics. Grasps the big picture and understands its implications. Comprehends the meaning of ecosystem and identifies the garden as one.	With little prompting, can draw connections between topics. Grasps the big picture and understands some implications. Knows how an ecosystem functions.	With guidance, is able to draw connections between topics. When explained, the big picture and the implications become clear. Understands that an ecosystem consists of many components.	Does not understand how to connect different topics, but puts forth effort by using personal anecdotes. The big picture is not clear and implications are not considered.	Does not seem to understand the big picture, even with help. Cannot connect personal experiences to the larger world.

Process Skills	Observes using the five senses, sorts, measures, infers, predicts sensibly, concludes and is able to clearly communicate that information.	With little prompting, is able to observe, classify, measure, infer, predict and clearly communication that information.	With moderate guidance, is able to complete at least four of the six process skills.	With consistent guidance and reminders to stay on task, is able to complete at least two of the six process skills.	Even with consistent guidance and reminders, cannot stay on task to complete more than the first step of the process.
Inquiry Skills	Comes to sound conclusions by asking sensible and creative questions. Both critical and creative thinking is used to develop questions.	With little prompting, can develop questions that lead to reasonable conclusions. Is able to use at least some critical and creative thinking.	With moderate guidance, is able to use questions to take steps toward sensible conclusions. Prompting leads to creative and critical thinking.	With a lot of guidance and prompting, is able to come up with questions, but it is necessary to begin the prompting again after each question is developed.	Cannot think in a critical or creative fashion to come up with a sensible conclusion. Goes on tangents regularly and cannot be brought back on topic.
Communication Skills	Completes short pieces of writing and art for journals. Expresses clear responses to writing; is able to understand written and oral instructions and information. Uses material from other media to enhance writing and art. Is able to participate in elevated discussions while problem solving.	Completes short pieces of writing and art for journals. Needs little help in expressing clear responses to writing. Is able to understand written and oral instructions and information with little explanation. Uses material from other media to enhance writing and art.	Completes outlines of ideas and rough sketches for journals. Requires assistance in expressing responses to writing and in understanding written or oral instruction and information.	With guidance, is able to make a list of ideas for journals. Requires repeated assistance in expressing responses to writing and understanding written and oral information. May need hand-over-hand assistance to write and phonemic awareness training to read.	Is not able to read or write. Does not possess the ability to orally communicate ideas effectively.

Practical Mathematics	Shows exceptional skill in estimating, measuring, collecting and analyzing data, charting and graphing, and determining probabilities.	Works hard to estimate, measure, collect and analyze data, chart and graph and determine probabilities in the garden.	Needs guidance to estimate, measure, collect and analyze data, chart and graph and determine probabilities in the garden.	Requires much help to estimate, measure and collect data. Has trouble charting and graphing. Cannot analyze and determine probabilities.	Shows no ability to relate what happens in the garden to the principals of math.
Cultural Awareness	Is familiar with and can communicate to others: agricultural traditions and celebrations, cultural uses of plants throughout history, including medicinal, global trade of plants and food.	Is familiar with agricultural traditions and celebrations, cultural uses of plants throughout history and global trade related to food, but needs prompting to communicate.	Needs reference materials to communicate agricultural traditions, medicinal uses of plants throughout history and modern global trade issue related to food.	Does not take initiative to learn about celebrations and traditions of food, medicinal uses of plants, and modern issues of global trade, but can absorb the information.	Cannot reiterate any information about cultural uses of plants and food.
Physical Ability and Awareness	Is capable of physically performing all garden related duties. Is at all times aware of the physical nature of an activity and possesses excellent dexterity. Is in control of his/her body at all times, even while working outside.	Is capable of physically performing most garden related duties. Is aware of the physical nature of an activity and needs little redirection. Is in control of his/her body at most times, even while working outside.	Is capable of physically performing some garden related duties. Often needs redirection, but is aware of the physical nature of the activity and is able to control his/her body, even while working outside.	Is capable of physically performing few garden related duties. Consistently needs redirection, and is not entirely aware of the physical nature of the activity. Cannot control his/her body while working outside.	Does not seem to have control of physical movements. Often bumps into things or people. Does not seem to be aware of the parameters of the physical self.

Plant Knowledge	Possesses a working knowledge of plant names, characteristics, needs, and interactions of plants in ecosystems. Is able to describe the structure and function of plant cells, flowers, roots, stems and leaves.	Possesses a thorough knowledge of plant characteristics, needs and interactions of plants in ecosystems. Is able to describe the function of plant parts and plant needs.	Possesses a general knowledge of plant characteristics and needs. Is able to name the parts of plants and describe their general function. Is able to identify basic needs of plants.	Can identify plant parts and has a general idea of their functions. Is able to identify basics needs of plants.	Cannot identify structure or function of parts of plants. Is not familiar with plant needs.
Nutrition Knowledge	Is aware of and can demonstrate the nutritional value of plants grown in the garden and the difference between local, organic and mass-produced foods.	Is aware of and can demonstrate the nutritional value of the most commonly grown edible plants. Understands the general difference between local, organic and mass-produced foods.	Understands that garden-grown plants are often high in nutritional value as compared with mass-produced fruits and vegetables.	Is familiar with basic nutritional concepts as related to a healthy body.	Is not familiar with nutritional values. Does not understand that eating nutritional foods is related to having a healthy body.

ANNOTATED BIBLIOGRAPHY AND RESOURCES

Abi-Nader, Jeannette, David Buckley, Kendall Dunnigan and Kristen Markley. *Growing Communities: How to Build Community through Community Gardening*. American Community Gardening Association, 2001

> Growing Communities Curriculum provides an in-depth exploration of the practices and strategies community organizers can use to develop dynamic leaders and create strong programs using a participatory approach to community building.

Barrett, Katharine D., Jennifer M. White, Christine Manoux. *Botany on Your Plate*. Grades K-4. South Burlington, VT; National Gardening Association, 2008.

> A much-loved curriculum in scores of schools, this book is an investigative science unit that introduces the world of plants through foods we eat. Children explore edible roots, stems, leaves, flowers, fruits, and seeds through observation, dissection, journaling, discussion of findings, and, of course, tasting. This unit supports standards in math, language arts, nutrition, and social studies, and includes background botany information for educators.

Behrens, Larry. A *Guide to the Planning and Development of Outdoor Classrooms.* Jefferson City, MO; The Conservation Commission of the State of Missouri, 1991.

> Conservation education encompasses all the activities and experiences which result in learning about people's dependency upon and use of natural resources to satisfy their needs and wants. Since 1941, the Missouri Department of Conservation has supported a formal education program through Missouri's public and non-public schools. This publication was developed as a reference source to supplement the Department's expanded conservation programs.

Center for Ecoliteracy. *Big Ideas: Linking Food, Culture, Health, and the Environment.* Berkeley, CA; Learning in the Real World, 2008.

> *Big Ideas* helps children and educators explore food systems and food choices by presenting these topics using four different perspectives: Food, Culture, Health and the Environment. This book is divided into sections determined by grade levels, states essential questions and provides sample activities to explore each perspective.

Coe, Mary Lee. *Growing with Community Gardening*. Taftsville, Vermont; The Countryman Press, 1978.

> This book is a comprehensive handbook for the rapidly spreading movement of community gardening. Community action agencies, churches, garden clubs and

communal homesteaders will find it a valuable guide to the theory and practice of cooperative vegetable gardening.

Grant, Tim and Gail Littlejohn. *Teaching Green: The Elementary Years, Hands-on Learning in Grades K-5.* Gabriola Island, Canada: New Society Publishers, 2005.

Teaching Green: The Elementary Years helps educators to meet this challenge through developmentally appropriate activities that engage students mentally, physically, and emotionally. Designed for anyone working with children from Kindergarten to Grade 5, whether in schools or in non-formal education settings, it offers 50 kid-tested teaching strategies for promoting interdisciplinary hands-on learning about natural systems and fostering critical thinking about environmental issues. The book includes background information and instructions for practical projects and activities in the following areas: Exploring Nature, Plants and Animals, Environmental Issues, Building Community, Global Awareness, Imagination and Celebration.

Hayden-Smith, Rose. *Soldiers of the Soil: A Historical Review of the United States School Garden Army*. "Monograph" University of CA, 2006
http://groups.ucanr.org/victorygrower/files/47755.pdf

This article, published in the University of California's magazine, "Monograph," describes in great detail the history of the United States School Garden Army, formed by the Department of Education in partnership with the Department of Interior during World War I to incorporate gardens into every school.

Hynes, H. Patricia. *A Patch of Eden.* Chelsea Green Publishing Co., 1996 and Fox, Tom with Ian Koeppel, Susan Kellam. "The Struggle For Open Space." Neighborhood Open Space Coalition, 1985.

These two resources are combined by many to describe the history of community gardens specifically in New York City and generally in the United States.

Jaffe, Roberta, and Gary Appel. *The Growing Classroom: Garden-Based Science.* South Burlington, VT; National Gardening Association, 2007.

This resource book for educators contains science, math, and language arts activities for students to do in the garden. Activities are aligned with California Science Content Standards. Topics include soil, plants, cycles, ecology, weather, nutrition, and food systems. Also includes team-building and sensory exploration activities, organic gardening skills, and information on how to create and sustain a successful school garden program.

Joshi, Anupama and Andrea Misako Azuma. *Bearing Fruit: Farm to School Program Evaluation Resources and Recommendations.* Center for Food and Justice. Urban and Environmental Policy Institute, Occidental College, 2007.

This book serves as a reference guide for Farm to School Practitioners and provides an introduction to the Farm to School idea, resources and tools, a literature review, and conclusion complete with recommendations.

Kiefer, Joseph and Martin Kemple. *Digging Deeper Integrating Youth Gardens into Schools and Communities.* Burlington, VT; Food Works, 1998.

Digging Deeper is a practical guide to establishing a youth garden project, integrating disciplines into an experiential curriculum, and working with the community to ensure success.

Koch, Pamela A., Angela Calabrese Barton, Isobel R. Contento. *Farm to Table & Beyond.* Grades 5 or 6. South Burlington, VT; Teachers College Columbia University and the National Gardening Association, 2008.

In *Farm to Table & Beyond* is one of the inquiry-based science modules in the LiFE Curriculum Series. This manual includes lesson plans with helpful background information, practical teaching tips, and tools for assessment; student activity sheets and readings; a matrix that maps Farm to Table and Beyond to the National Science Education Standards and Benchmarks for Science Literacy

Koch, Pamela A., Angela Calabrese Barton, Isobel R. Contento. *Growing Food.* South Burlington, VT; Teachers College Columbia University and the National Gardening Association, 2007.

Growing Food is an inquiry based curriculum that takes a multifaceted approach to the question: "How does nature provide us with food?" The 20 lesson plans contained within were written to meet National Science Education Standards and engage students in science education via the QUESTA (questioning, experimenting, searching, theorizing, and applying to life) approach. All lessons have undergone classroom testing and all are complete with background information, illustrations, activity worksheets, and suggestions for assessment

McKelvey, Bill. *Community Gardening Toolkit.* University of Missouri Extension, 2009. http://extension.missouri.edu/publications/DisplayPub.aspx?P=MP906

This invaluable toolkit was designed in cooperation with many partners and various community gardening resources from around the country. It offers a short history of community gardening, challenges, benefits and dozens of tips to starting and sustaining a successful community garden.

Ocone, Lynn and Eve Pranis. *The National Gardening Association Guide to Kids' Gardening: A Complete Guide for Teachers, Parents and Youth Leaders*. New York: John Wiley & Sons, 1990.

This guide includes the six basic challenges of gardening: planning for success, developing your site, designing the gardens, the fun of gardening, the basics of indoor gardening and container gardening, and a world of youth gardens. Each section of the book includes illustrations as well as extra activities such as crossword puzzles. This guide is also particularity helpful in making connections to curriculum in the classroom.

Payne, Karen and Deborah Fryman. *Cultivating Community: Principles and Practices for Community Gardening as a Community-Building Tool.* American Community Gardening Association

This publication explores basic principles and values of successful community empowerment programs of any kind, and illustrate how these principles have been applied to community gardens across the country. The document showcases how community gardening programs can advance community development, empower local leadership and nurture families, strengthen economic development and improve overall quality of life. Cultivating Community provides useful tips on how to approach community gardening as an organizing tool and highlights specific practices and activities that have been proven to work. Stories and case studies from community gardens around the United Sates are featured.

Pranis, Eve. *Nourishing Choices: Implementing Food Education in Classrooms, Cafeterias, and Schoolyards.* Burlington, VT; National Gardening Association,2008.

Drawing on a wealth of collective experience, this book offers a roadmap for developing a food program and exciting children about healthful eating. It features details on ensuring sustainability and profiles of winning school- and district-based initiatives.

Sobel, David. *Place-Based Education: Connecting Classrooms & Communities.* Great Barrington, MA; The Orion Society, 2004-05.

This book describes the process of using project-based experiential education to teach academic concepts and to reunite students with their own communities, thereby enhancing their appreciation of the natural world and human connections within.

Stone, Michael K. and the Center for Ecoliteracy, *Smart by Nature: Schooling for Sustainability*. Healdsburg, CA; Watershed Media, 2009

> *Smart by Nature* documents a movement to change K-12 education by incorporating environmental education, rethinking school food and transforming school into sustainable communities. It includes success stories, practical checklists, strategies and ideas for educators.

Trumbauer, Lisa. *Getting Down and Dirty! Community Gardens*. Columbus, OH; Zaner-Bloser, Inc.

> Many neighborhoods have ugly, problem places. That doesn't mean these places have to stay ugly forever. Across the country, many people are identifying ugly paces and changing them. They're turning these places into beautiful community gardens. What other problems can community gardens solve? Theme 3: Conflict Resolution, Grade 4, Guide Reading Level 5.

The Whitmire Study: Gateway Greening Community Garden Areas, Reversing Urban Decline. Public Policy Research Center at the University of Missouri-St. Louis, 2005

> This study for Gateway Greening focuses on 54 of its garden partners. The purpose was to examine the relationship between community gardens and their immediate neighborhood.