

**KINDERCARE EDUCATION
2020 WHITE PAPER**

Creating Healthy Habits Through Gardening



“I can’t tell you how much our children are loving their gardens! From planting the seeds, to seeing the fruits and veggies grow, to actually then eating them has been so amazing to watch! Teaching our children the importance of making good food choices and trying new things is not always easy...you know, ‘green’ means ‘yuck!’ However, when grown from the ‘fruits of their labor’ they are so willing to try just about anything!”

- District Leader, Texas



Introduction

Childhood obesity is a significant problem in the United States and one that can have a negative impact on a child’s long-term health and academic success. Low vegetable consumption has been correlated with lower academic performance and obesity.¹ However, research demonstrates a link between school gardens and improved health factors for school aged children; with increased support for local gardening and Farm to School programs, there is a shared belief that exposure to fresh fruits and vegetables through gardening and farm programs has a positive impact on a child’s health and academic achievements.^{2 3}

In addition to long lasting health benefits, school gardens have a positive impact on other key health, academic, and psychological results for children.⁴ For example, studies have shown that school gardens can improve engagement and interest in science studies, especially for students from ethnic and racial minority groups.^{5 6}

1 Neumark-Sztainer, S. (1996). Correlates of Inadequate Fruit and Vegetable Consumption among Adolescents. *Preventive Medicine*, 25(5), 497–505. <https://doi.org/10.1006/pmed.1996.0082>
 2 Berezowitz, B. (2015). School Gardens Enhance Academic Performance and Dietary Outcomes in Children. *The Journal of School Health*, 85(8), 508–518. <https://doi.org/10.1111/josh.12278>
 3 Davis, V. (2011). LA Sprouts: A Gardening, Nutrition, and Cooking Intervention for Latino Youth Improves Diet and Reduces Obesity. *Journal of the American Dietetic Association*, 111(8), 1224–1230. <https://doi.org/10.1016/j.jada.2011.05.009>
 4 Ozer, E. (2006). The Effects of School Gardens on Students and Schools: Conceptualization and Considerations for Maximizing Healthy Development. *Health Education & Behavior*, 34(6), 846–863. <https://doi.org/10.1177/1090198106289002>
 5 Williams, B. (2018). Science in the Learning Gardens (SciLG): a study of students’ motivation, achievement, and science identity in low-income middle schools. *International Journal of STEM Education*, 5(1), 1–14. <https://doi.org/10.1186/s40594-018-0104-9>
 6 Williams, D. (2013). Impact of Garden-Based Learning on Academic Outcomes in Schools: Synthesis of Research Between 1990 and 2010. *Review of Educational Research*, 83(2), 211–235. <https://doi.org/10.3102/0034654313475824>

Opportunity

Healthy habits can start very early in a child’s life, even sooner than many people may think. Children’s food preferences are influenced by experience and strategies to introduce new foods in a variety of ways. Touching, smelling, playing with, and tasting, can all encourage a child’s willingness to try a wider variety of fruits and vegetables as they grow. Once established, healthy eating habits can have a lasting impact on diverse aspects of a child’s life.

From first bites of solid foods to full meals, KinderCare’s menus are thoughtfully designed to introduce children to tastes and textures from around the world. KinderCare Education (KCE) does more than just prepare children for school. Our educators and experts give children a strong foundation, and we recognize the importance of guiding all children in the development of healthy habits that can last a lifetime.

Because children’s taste preferences are shaped by their experiences and exposure to food before they reach elementary school, we introduce children to a wide variety of flavors and textures from the start, in order to expand their palate to accept more fruits and vegetables in their diets.⁷

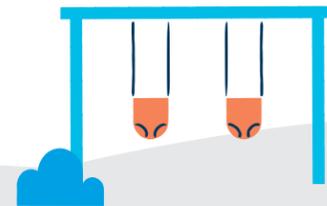
Fruit, vegetable, and herb gardens provide children with the opportunity to try foods that they grow themselves, which increases the appeal of experimenting with new foods. As a result, KCE created the Gardening Toolkit. This toolkit provides children with gardening opportunities in their early childhood education programs or at home, broadening their experiences with fresh fruits and vegetables, encouraging their willingness to try new foods and, ultimately, helping to create healthy habits that will last a lifetime.

Early Childhood Education (ECE) programs provide children throughout the nation with opportunities to learn and grow, so they can develop educational and lifestyle habits that last a lifetime. KCE seeks to introduce the benefits of a gardening and nutrition education program with young children through the Gardening Toolkit.

Methods and Considerations for Establishing Gardens

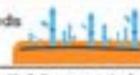
Understanding the availability of space, the types of crops appropriate for each region, the materials needed to get started, ensuring that all materials are child-safe and developmentally appropriate, and a long-term sustainability plan are all important aspects of creating a successful garden experience. KCE centers’s outdoor spaces are uniquely different from each other. Therefore, it is important to start with the appropriate location and type of garden for each center. The KinderCare Garden Toolkit is a digital guide that shows teachers the important considerations needed before getting started on a center garden. The following pages include excerpts from KinderCare’s Garden Toolkit.

7 Johnson, S. (2016). Developmental and Environmental Influences on Young Children’s Vegetable Preferences and Consumption. *Advances in Nutrition* (Bethesda, Md.), 7(1), 220S–231S. <https://doi.org/10.3945/an.115.008706>



Gardening Toolkit

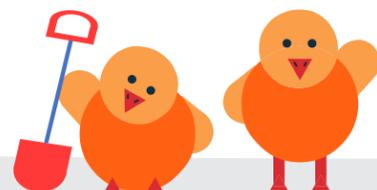
Types of gardens

	Indoor or Outdoor Containers 	Outdoor In-Ground 	Outdoor Raised Beds 
Sun	Small patches of sun or indirect sun	Large area with full sun most of the day	Large area with full sun most of the day
Water	Water every other day	Water every day	Water every day
Soil	Small amounts of soil needed depending on container size	Moderate amount of amended soil needed to mix into dirt	Large amounts of soil needed to fill boxes
Basic Materials	Pots, soil, seeds *Recycled Pot Ideas: • Milk/food cartons • Plastic water bottles • Paper cups • Egg cartons • Tin cans (cover sharp edges with sand paper) • Reusable plastic bag greenhouses	Soil, seeds, tools* *Small or large tools needed to mix the dirt and add-in additional soil from Marketplace (shovels, rakes, hose, gloves).	Raised bed(s), soil, seeds *Raised beds can be purchased on Marketplace.
Expense	Low cost	Moderate Cost	Moderate Cost
Mobility	Easy to move if needed	Cannot be moved	Challenging to move

What to grow

Consider your space and the age group you are working with when selecting seeds or starters. Speedy crops may be better for indoor gardens, while slow crops may be best for raised beds or in-ground gardens.

Speedy Crops	Moderate Speed Crops	Slow Crops
basil, green onions (scallions), lettuce, marigolds (these flowers are edible), radishes 	bush beans (green beans), chard, cilantro, cucumbers, kale, kohlrabi, parsley 	beets, broccoli, cabbage, carrots, leeks, onion, parsley, shalots, sugar snap peas 



Gardening Toolkit

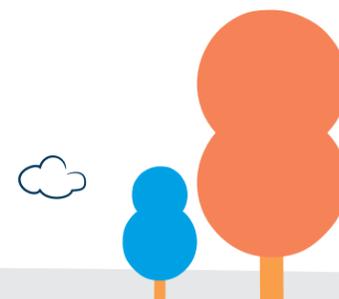
Supplies

Your gardening adventure can range from no cost, to low cost to moderate cost depending on your available budget and garden type. Families can bring in seeds from culturally favorite fruits or vegetables, helping to build a bridge between home and center, while engaging families in the garden.

	No Cost	Low Cost	Moderate Cost
Tools	• Milk/food cartons (scoop)	• Paper cups (scoop) • Spray bottles (water or water and soil) • Watering can • Garden hand tool set	• Garden Hose • Shovels • Rakes
Containers	• Milk/food cartons • Plastic water bottles • Paper cups • Egg cartons • Tin cans (cover sharp edges with sand paper) • Reusable plastic bag greenhouses • Ask local businesses or families for donations.	• Ceramic flowerpots • Indoor gardening kit 	• Raised Garden Kit • Ask local businesses or families for donations.
Soil	Ask local businesses or families for donations (ensure soil is free of pesticides)	• Soil (depending on quantity)	
Seeds	Ask local businesses or families for donations	• Seeds	• Seeds
Seed Labels	• Old Utensils • Rocks	• Craft Sticks • Wooden Dowels • Wooden Spoons • Clothespins	

Getting started

1. Select your garden type and make a supply list.
2. Select the age group and learning activities, curriculum, or home activities appropriate for their development level.
3. Gather supplies and communicate to the children about your upcoming project.
4. Start gardening, take photos, and share the fruits of your labor!



Gardening Toolkit

Sustainability

Maintaining a garden

You've done a great job and invested in your children and their experiences! Now, make sure the garden lasts throughout the year using the information below.

Watering

The weather will determine how much water the garden needs. In order to test, put your finger an inch or two into the soil. The surface should be lightly dry, but underneath should be moist. Watering by hand each morning gives you and the children a chance to observe the garden and decide together whether to increase or decrease water based on the current weather.

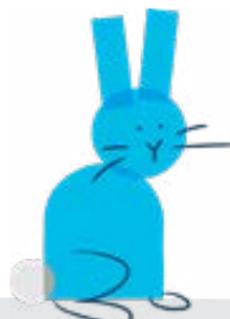
Have the children... Use the hose, watering cans, or spray bottles to water the garden each morning.

Planting seasonally

Planting in the correct season is very important. Some plants like cilantro and lettuce do well in cool weather but may wilt as the days get too hot. Other plants, such as kale, can last through both cool and hot weather. Use the chart below to identify which plants to grow depending on the weather in your area

Have the children... Help you select which plants to grow each season.

When to Plant	Crops
Spring (cool weather)	beets, broccoli, cilantro, carrots, kale, leeks, lettuce, onions, parsley, pea shoots, radishes, scallions, shallots, spinach, sugar snap peas
Summer (warm weather)	basil, bush beans (green beans), cucumbers, eggplant, kale, peppers, pumpkin, summer squash, tomatoes, tomatillos, zucchini
Fall (cool weather)	beets, cilantro, garlic, kale, parsley, scallions, spinach



Gardening Toolkit

Garden winterization

At the end of the year, remove any dead plant matter from your garden or planting containers. For large plants, you can clip the plant off at the base and leave the roots in the soil to decompose over the winter.

Have the children... Help you pull up any dead plants. The winter is a great time to evaluate the year. How did the garden do?

Have the children... Talk about their gardening experience and even what they would like to garden next year.

If you live in a climate where the winter season is not too cold and growing a garden is still possible, consider keeping your garden growing through the season. Consider the Spring or Fall cool weather plants from the Planting Seasonally table.

Have the children... Pull up old plants from the prior season and then use their tools to plant new seeds or starters for your cooler winter season.

Garden pests

Prevention is the best possible type of pest management for your garden. It is important to take the time to observe the garden, if only for five minutes one to two times during the week. Look for discolored leaves, slow or stunted growth, or sticky sap on the surface of the leaves. Take note of the bugs you see even if you cannot identify them just yet. Marigolds, Chrysanthemums and many herbs planted in your garden can be used as pest repellents.

Below are a couple pest prevention ideas:

Have the children... Use spray bottles to spray dye-free, fragrance-free soapy water on plants.

Have the children... Use the hose, watering cans, or spray bottles to water the garden each morning.

Have the children... Pull diseased plants out of the ground or pot and throw them away.

Have the children... Select where to plant pest repellents and use their gardening tools to help plant the seeds or flowers.

Benefits of Establishing a Garden

Many KCE centers with gardens experience a surge in parent and family engagement. Family members are eager to volunteer their time and energy as well as offer their knowledge and experience. This is a great opportunity to introduce culturally favorite flavors through produce and herbs. Many centers host gatherings for parents and families to enjoy the harvests from the gardens. Events such as “Picnic on the Playground” and “Celebrate the Fruits of Our Labor” included tastings, recipe-sharing, and the opportunity for students to show off their garden-related science, literacy, art, math, and building/manipulatives projects and activities.



Fruits and vegetables lead to long term healthy habits

Garden-based education helps children connect to the earth and to understand where healthy, nutritious foods come from. Children who engage in garden-based learning are more likely to accept and eat more fruits and vegetables.⁸ Gardening with children not only introduces them to a wider variety of fresh foods, it also increases a child’s willingness to try these foods.⁹

One of KCE’s highest priorities is to enhance the health and well-being of the children we serve. The Garden Toolkit helps increase our children’s knowledge of and enthusiasm for fresh fruits and vegetables. Through active participation in on-site teaching gardens, children learn about how garden-fresh, non-processed foods help grow strong, healthy bodies. We see that when children select, plant, nurture, and harvest their own food, picky eaters are much more willing to try foods they may otherwise be wary of from the supermarket (such as purple tomatoes or a hybrid squash). In other words, gardening inspires adventurous eating! A child’s early experiences with food can have a long-lasting impact on their overall health.

8 Wang, R. (2010). Exposure to a Comprehensive School Intervention Increases Vegetable Consumption. *Journal of Adolescent Health*, 47(1), 74–82. <https://doi.org/10.1016/j.jadohealth.2009.12.014>

9 Morris, Z. (2002). Garden-enhanced nutrition curriculum improves fourth-grade school children’s knowledge of nutrition and preferences for some vegetables. *Journal of the American Dietetic Association*, 102(1), 91–93. [https://doi.org/10.1016/s0002-8223\(02\)90027-1](https://doi.org/10.1016/s0002-8223(02)90027-1)

Fruits and vegetables not only taste great, they make great medicine

Fruits and vegetables are an abundant source of antioxidants, energy, vitamins, minerals, dietary fiber, and water. While almost all sources of food provide some of these components, foods that are processed have lost much of their nutritional value. While there are specific conditions that require additional vitamin and mineral supplements, natural food sources provide all the nutrients a child needs to be healthy. Whole foods rarely cause imbalances or toxicities and the body absorbs nutrients best from foods in which the nutrients are included with other elements to support proper absorption.¹⁰ Since good nutrition is associated with a decrease in chronic diseases like childhood obesity, diabetes, and coronary disease, early and novel exposures to a variety of fruits and vegetables increase a child’s familiarity with a variety of textures and flavors and their acceptance of these healthy choices.

Now, more than ever, we are seeing the need for education and exploration around fruit and vegetable consumption for optimizing immune function. While it is widely accepted that fruits and vegetables contain vitamins and minerals that are good for us, there is also compelling evidence that eating a wide variety of plant foods in all colors of the rainbow can help our bodies resist illness and disease.

Fruits and vegetables lead to higher academic achievement

Science demonstrates that health problems influence a child’s ability to learn. Healthy, well-nourished children are more likely to attend school and be ready to engage with the curriculum.¹¹ Studies have found students at schools with healthy school lunches score higher on state achievement tests, with larger test score increases for students who are eligible for reduced price or free school lunches.¹² Eating well balanced meals on a regular basis helps to ensure children are healthy, present, and ready to learn each day.

Time outdoors has benefits, too!

School gardens help promote physical activity¹³ and gardening is an opportunity for children to get outdoors in a safe and healthy way. Children at schools with gardens demonstrate more moderate physical activity and less sitting than children in schools with no gardens; Gardening allows children more chances to move their bodies during the day which can play a role in gross motor development, as well as strengthening bones and muscles. Children often spend limited time outdoors; time spent weeding, harvesting, and watering gardens can increase a child’s vitamin D levels, reduce stress levels, and enhance their immune systems.¹⁴

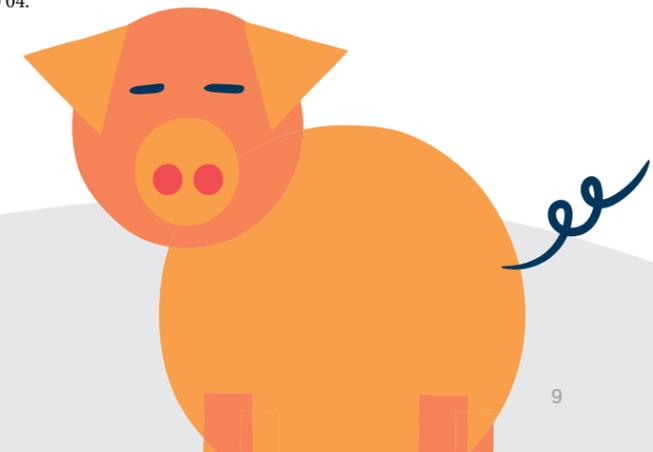
10 Whitney, E., & Rolfes, S.R. (2019). *Understanding Nutrition* (15th edition). Boston, MA: Cengage Learning, Inc.

11 Basch CE. (2011). Healthier Students Are Better Learners: A Missing Link in School Reforms to Close the Achievement Gap. *Journal of School Health*, 81(10), 593-598.

12 Anderson, M., Gallagher, J. & Ritchie, E. (2017). School Lunch Quality and Academic Performance. National Bureau of Economic Research. Retrieved from <http://www.nber.org/papers/w23218>.

13 Wells, M. (2014). School gardens and physical activity: A randomized controlled trial of low-income elementary schools. *Preventive Medicine*, 69, S27–S33. <https://doi.org/10.1016/j.ypmed.2014.10.012>

14 Kuo, F. (2004). A Potential Natural Treatment for Attention-Deficit/Hyperactivity Disorder: Evidence From a National Study. *American Journal of Public Health* (1971), 94(9), 1580–1586. <https://doi.org/10.2105/ajph.94.9.1580.04>.



Celebrating diversity in the classroom

KCE centers make a point of embracing diversity in all forms (ethnicity, language, ability, income, race, gender expression, just to name a few) so children understand that we are all one, interconnected community. We embed this value in our curriculum by using the garden as a metaphor: just as all the different plants in a garden (tomatoes, summer squash, lavender) need sunshine, water, and soil, some need more sun than others, and some need less. There are plants that require pruning while others do not. In other words, even though plants have different needs they share common resources, so when one plant in the garden suffers, all plants are at risk. This is the same for people. Understanding this kind of interconnectedness encourages children learn to value and respect each other, celebrate our differences, and appreciate what we have in common. Gardening incorporates a wide variety of backgrounds, experiences, and agricultural histories of families in our programs by inviting them to share any cultural traditions or ideas that could help inform our work plan, curriculum, and activities.

Conclusion

At KCE, we found that school gardens help expose children to whole foods with a wide variety of textures and flavors, helping expand their palate and willingness to try new foods. This foundation for good nutrition helps children connect to their environment, understand where food comes from, and practice healthy eating habits from an early age. Since good nutrition is associated with a decrease in chronic diseases, early and novel exposures to a variety of fruits and vegetables increases a child's familiarity with a variety of textures and flavors and increases their acceptance of these healthy choices. Healthy, well-nourished children are more likely to attend school and be ready to engage with the curriculum. School gardens also provide the opportunity for children to get outdoors in a safe and healthy way, allowing children more chances to move their bodies and supporting gross motor development, increasing vitamin D levels, and reducing stress. Gardening is also a great way to incorporate a wide variety of backgrounds, experiences, and agricultural histories of families by sharing cultural traditions or favorite family recipes.

"I loved that the garden taught them about science and got them outside. My son loved taking home the herbs like basil and oregano. He wanted to start a garden at home, so we did!"

- Parent, Toepperwein Road KinderCare



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"Among many other things our garden is teaching patience to our children. I often think of the quote, 'As I work on the garden, the garden works on me' from Gayla Trail. This garden program has been a wonderful experience for everyone so far and we are very grateful."

- Center Director, Nacogdoches KinderCare