Natural Learning Initiative

Gardening Activity Guide: A resource to promote vegetable and fruit gardening with young children

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Natural Learning Initiative
Activity Areas

Creating environments for healthy human development and a healthy biosphere for generations to come

- Annual events and tours
- Regional Symposia
- Higher Education Modules
- Certificate Programs
- Creation of demonstration, model sites: zoos, botanical gardens, parks, nature centers, childcare, schools, neighborhoods
- Specialized consultation to landscape architects, designers

Research & Evaluation
- Post Occupancy Evaluations (POEs)
- Research studies
- Best Practice indicators

Professional Development
- Annual events and tours
- Regional Symposia
- Higher Education Modules
- Certificate Programs

Design Assistance
- Creation of demonstration, model sites: zoos, botanical gardens, parks, nature centers, childcare, schools, neighborhoods
- Specialized consultation to landscape architects, designers

Comprehensive Projects
- Multi-year projects including:
  - Design Assistance
  - Professional Development
  - Evaluation
  - Resource Dissemination

Information Communication
- NLI website
- Toolkits
- Online resources, media
- Green Desk

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In our garden we learn to...

Predict
Plan
Observe
Weed and water
Measure
Pick
Eat
Gardening!

- Container Pots
- Grow Bags
- Straw Bales
- Raised Garden Bed
- Trough Raised Bed
Childcare Outdoor Learning Environments as Active Food Systems: Effectiveness of the Preventing Obesity by Design Gardening Component

USDA – NIFA Integrated Project

Research Randomized controlled trial (RCT) research design to assess the impact of gardening on children’s physical activity, fruit and vegetable liking, knowledge, and consumption.

Education

Extension

Typical garden layout
The garden included the same types of fruits and vegetable that children were offered during afternoon snacks to measure fruit and vegetable consumption.
Gardening Activity Guide

Contents

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• 1-12 Gardening Activities
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Our Gardening Activities Calendar

Gardening Activities

Time to Harvest: Cool Season & Warm Season
Suggested Activities

From Gardening Activities

Phase I: Preparing

Exercising Seeds & Plants

About life cycles and what plants do

**Vocabulary**
Life, Meiosis, Flower, Garden Plant, Garden, Seed, Hose

**Fun Seed Facts**
1. A seed is a dormant plant (embryo).
2. Food storage, which supplies fuel for the embryo including proteins, carbohydrates or fats.
3. A seed coat that protects the embryo from diseases, pests, and moisture, and holds it in place.
4. Proper temperature, moisture, oxygen, and light: These three components are needed to germinate the seed.
5. Water pathway: Water moves through the seed coat, the seed, and the plant to reach the leaves.

**Book Suggestion**
*Planting a Rainbow of Food Plants* by Libba Dashofy

Phase II: Caring

Watering

Experiencing the essential source of life

**Vocabulary**
Water, Rain, Watering, Water, Victor, Hose, Water

**Watering Tips**
- Water the plant in the morning or evening to prevent water stress.
- Water deeply and thoroughly to encourage the plant to grow and store water.
- Avoid overwatering the plant, which can lead to root rot.
- Use a hose or watering can to apply water directly to the roots.

Phase III: Harvesting and Eating

Harvesting

Learning patience until things are ripe!

**Vocabulary**
Harvest, Harvesting, Food, Produce, Fruits, Vegetables, Soup, Corn, Tomato, Salad

**Book Suggestion**
*The Kitchen Garden* by Alice Waters

Creating a Farmer’s Market

- After harvesting fruits and vegetables from the garden, create a farmer’s market with the children where they can sell produce to their parents. This reinforces healthy eating habits, encourages healthy lifestyle changes such as buying local and seasonal foods, and promotes parent engagement.

Harvesting Tips
- Most fruits and vegetables last best if allowed to ripen on the plant. However, you may decide to harvest a fruit to get it before the birds do.
- Fruits and vegetables often change color as they ripen.
- Harvest early in the morning and keep produce cool and covered.
- Be gentle. The vegetable is ripe and ready to be picked, but if picked too early, can result in poor quality.
- Harvest frequently to prevent the bounty. Each plant’s yield is determined by the number of seeds—more fruits fully mature, the more seeds produced, and the more that produce flowers and fruit.
- Wash hands before and after harvesting.
Phase 1: Preparing & Suggested Resources

Description
Planting can begin with either seeds or transplants. Transplants are satisfactory to use because the plant has already been nurtured by the children. Through planting activities, adults start to take responsibility in caring for other living things. Ask if they have planted before and how it felt. Warm-season gardening starts after the last frost. Timing depends on the type of vegetable and whether it’s grown from seed or transplant. Check with your local Cooperative Extension agency to learn more about planting calendars for your area.

Suggested Activities

Planting Seeds
- Discuss why it is much easier to grow some plants from seed, such as beans.
- Talk about spacing seeds so plants don’t compete for growth. Use this analogy: if the children in the classroom had to share one cup of water each day, how would they feel?
- Distribute seeds in small cups and a pointed trowel to pairs of children.
- Discuss the best places to plant. One child drags a pointed trowel to create a shallow planting row. The other child, guided by the teacher, deposits the seeds at intervals specified on the packet. Both children press light covering of soil back over the seeds in the row.

Planting Seedlings
- Once weather permits, seedlings can be transplanted to outdoor beds. Use newspaper pot seedlings grown in the classroom or transplants from elsewhere.
- Review with the children how they started with seeds, sprouted them with water, grew seedlings in the classroom, and prepared the beds with good soil. Now the season has arrived for planting outdoors.
- Supply each child with their own seedling to plant and care for.

- Discuss what plants and children need to be healthy and grow strong. Is there anything plants need that children don’t? And vice versa?
- Observe growing conditions such as sunlight, shelter, and protection from trimming. Ask children: why do we plant in raised beds?
- Ask children: why do we use mulch to cover the soil surface?
- Encourage children to care for their seedlings by watering.

Vocabulary
Care, Growth, Planting, Protect, Seedlings, Shelter, Transplant

Book Suggestion
How Grandpa’s Garden Grow (Lynea Lively) tells a story about a young gardening family, how to plant and tend her own garden and flowers, and how to make new friends. Ask children about the interesting aspects of the story. Discuss how it relates to their gardening experiences.

Planting Tips
- Plant small seeds only ½ inch deep, larger seeds up to 1 inch deep.
- Do not allow the roots to dry out.
- Carefully remove plants from pots by squeezing sides. Tip plant headfirst between fingers. Keep root ball intact and cradle in hand to plant.
- Plant transplants in the soil at the same depth as they are in the pot.

PLANTS FOR OUTDOOR LEARNING ENVIRONMENTS

INFO SHEET
Plants are a critical outdoor learning environment (OOLE) best practice. Different species can provide shade, visual screen, wind barriers, and enhance seasonal play opportunities. For children, plants create a magical world where imaginations can endlessly roam. Natural hues, such as tans and greens, are used as props to stimulate imaginative play. Plants improve outdoor comfort, moderate children to spend more time outside, and add cost-effective play and learning value to the OOLE.

PLANT TYPES
Understanding different plant types enables wise plant selection, cost-effective purchase decisions, and learning. This guide presents plant types and guides plant selection to create successful, naturalized OOLEs.

Trees provide shade, visual screens, and wildlife habitat. They are also key to edible landscape components. Specific species, such as trees, provide climbing opportunities.

Shrubs provide interesting foliage, fragrance, color to the ground for children and enjoy. Some shrubs provide many attract birds, butterflies, and other wildlife. Shrubs can grow in a variety of conditions, such as blackberry or goose, provide a nesting value in an OOLE.

Ornamental grasses are tough and easy plants that look good year-round, even in winter season. They are often saxifrage mazes that can take heavy foot traffic. Ornamental grasses provide many benefits: variety and play opportunities.

Groundcovers can be used to naturalize areas under trees and shrubs. Include some herbs that are effective when planted between paving.

Annual flowering plants add diversity, fragrance, and beauty to the OOLE. Annuals thrive for climate, weather, and irrigation needs. Includes a variety of flowers, seeds, and bulbs. Consider include planting flowers for indoor decoration or cutting.

Annual flowering plants are a great way to maintain color to the OOLE, especially when dwell, rescues allow children to explore flowers, pollinators, and insects. The children can use flowers to create a natural environment for outdoor play.

WATERING REQUIREMENTS
Well-draining, high-quality potting soil and proper drainage are crucial for carnivorous, wetland, and indoor plants. Containers for indoor plants should have holes on the bottom to allow water to drain: place a small saucer under plant pots to catch water. Water directly above the soil. Check specific water needs for each plant and keep in mind that some watering follows the natural common routine of drought for indoor plants. Some houseplants do not prefer the same watering schedule: instead, stick your finger in the soil to check. If it’s moist or dry, water the soil rather than the plant to avoid root rot and mold.

TOXICITY LEVEL
Some common, low maintenance indoor plants can be toxic to many humans or animals. Carnivorous plants, specifically the Venus flytrap, can be toxic to a variety of species. Avoid planting any species that could be harmful to avoid food. Check specific water needs for each plant and keep in mind that some watering follows the natural common routine of drought for indoor plants. Some houseplants do not prefer the same watering schedule: instead, stick your finger in the soil to check. If it’s moist or dry, water the soil rather than the plant to avoid root rot and mold.

INDOOR PLANTS FOR HOMES AND CLASSROOMS
INFO SHEET
Indoor plants provide numerous benefits to both educational and home environments, including a reduction in stress levels, improved concentration, and improved air quality. Teachers enjoy the opportunity to care for plants through watering, pruning, and propagating potted classroom plants on theitized. In this INTSheet outlines low maintenance indoor plants, light and water requirements, and known levels of toxicity.

LIGHT CONDITIONS
Indoor plants thrive in a variety of lighting conditions depending on their species. Some plants can tolerate a wide variety of lighting conditions, while others have more specific requirements. Inside, it is essential to understand that the room’s light condition is available and where plants can thrive. When selecting indoor plants, check the lighting condition in your room. Direct sunlight: if your room’s windows directly face a window, it is considered direct sunlight. This is most common in south-facing windows.

Indirect light: indirect light occurs when the sun’s rays are reflected off of something else before hitting the plants. Plants often receive bright, indirect light by being close to windows – place a sheer curtain on windows that receive direct sunlight to prevent plants from getting direct heat.

Low light: low light conditions indicate that no direct light will reach the plant. Low-light plants can thrive in less light, but they will feel away from a light source or in a corner with indirect light. Low light doesn’t mean “no light,” but in such conditions are very well suited to thrive. Low-light plants are flowers, rubber plants, and other species.

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Well-draining, high-quality potting soil and proper drainage are crucial for many indoor plants. Containers for indoor plants should have holes on the bottom to allow water to drain: place a small saucer under plant pots to catch water. Water directly above the soil. Check specific water needs for each plant and keep in mind that some watering follows the natural common routine of drought for indoor plants. Some houseplants do not prefer the same watering schedule: instead, stick your finger in the soil to check. If it’s moist or dry, water the soil rather than the plant to avoid root rot and mold.

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Examining Seeds & Plants

About life cycles and what plants do

Description
Examining seeds and plants can start a conversation about life cycles and motivate children to explore the living world around them. Together, we can begin taking steps in early science learning such as classifying, exploring shapes, size, color, and weight, and the gradual acquisition of scientific knowledge.

Suggested Activities
Classifying Seeds
• Hunt for a variety of seeds outdoors using small cups to collect them.
• Gather inside to discuss where seeds come from and how they produce new plants.
• Ask children to examine and classify seeds based on shape, size, color, and weight.
• Sort the seeds according to source plant (tree, shrub, vine, ground cover, vegetable, fruit, or flower).
• Ask children: do vegetables have flowers?
• Examine seeds that will become plants in your garden.

Examining Plants
• Ask a local nursery or garden center to donate a few potted vegetable plants that are past their prime and unattractive. Explain that these plants will be used to educate future customers.
• In the classroom, divide children into small groups of three or four to a table and give each group a plant out of the pot to examine.
• Encourage children to examine different plant parts (root, stem, leaf, flower, fruit). Ask them to describe what they see and guess what each part does to help the plant grow.
• If possible, replant or compost the example plants.

Vocabulary
Different, Examine, Flower, Garden, Plant, Same, Seed, Tree

Book Suggestion
How a Seed Grows (Heleme J. Jordan and Loretta Kupelski) teaches young children how little seeds can become the plants and trees that surround them every day. An informative read.

Fun Seed Facts
• Seeds contain three parts: 1. A dormant, miniature plant (embryo) 2. Food storage, which supplies nutrients for the embryo including proteins, carbohydrates, or fats 3. A seed coat that protects the embryo from diseases, insects, and moisture until it is time to germinate.
• Proper temperature, moisture, oxygen, and light lead to germination. First, water is drawn in through the seed coat. Next, the primary root will emerge and eventually sprout root hairs and lateral roots. Then, the stem will emerge with the first leaves of the plant.
• Seeds can vary greatly in size, shape, texture and color. A coconut can be as big as your head, but it is still a seed!

Oh, how seeds will grow!
Time to Harvest: Cool and Warm Season

Spinach

Helpful Tips
- Spinach is best eaten fresh. It loses nutritional value with each passing day.
- When boiled, many of the nutrients leach into the water.
- Spinach is a good source of vitamin C, vitamin A, and minerals including iron.
- Baby spinach leaves have a sweeter flavor and more tender texture than full-grown leaves.

Harvest
Individual leaves are ready to harvest four to six weeks after planting when they reach at least 4 inches long. Pick from the exterior of the plant to extend the harvest period. Spinach may be stored up to two weeks in a reusable produce container in the refrigerator.
### Gardening Activities Calendar

A tool to record daily and weekly interactions related to each gardening process.

Children are active participants in documenting gardening & related activities.

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Examining Seeds & Plants

About life cycles and what plants do

Description
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Vocabulary
Different, examine, flower, garden, plant, same, seed, picture

Book Suggestion
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Teaches young children how little seeds can become the plants and trees that surround them every day. An informative read.

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- If possible, replant or compost the example plants.

Oh, how seeds will grow!

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Resources
Nature play and learning every day!

MISSION

“Creating environments for healthy human development and a healthy biosphere for generations to come.”
Topics:

- Starting Seeds in the Spring
- Sensory Gardens
- Selecting, Installing, and Managing Plants
- Tire Planters
- Theme Gardens
- Children’s Vegetable Gardens: Introduction
- And so much more!
NLI’s Videos on Gardening

Garden Harvesting, Preparing, Snacking

Children who grow their own fruits and vegetables are more likely to try and enjoy new foods. Harvesting, snacking on, and preparing fresh foods help children build healthy eating habits that can last a lifetime.

Incremental Development

The creation of a high-quality outdoor learning environment doesn’t happen overnight. Projects develop in phases as funding, volunteers, and resources become available. A masterplan guides the phasing of projects over many years.
NC State University | NLI | CERTIFICATE PROGRAMS

For Early Childhood Educators

Early Childhood Outdoor Learning Environments

• Early childhood educators
• Public Health professionals
• Technical Assistance providers
• Cooperative Extension Agents
• Master Gardeners
• Park and Recreation Professionals
• Volunteers working with early childhood institutions
• Designers

Fully online | Self-paced | 24hs in 12 weeks | 2.4 CEUs

Recorded in English with transcripts

1,400 participants to date

For Designers

Designing Early Childhood Outdoor Environments

NC State Design
National Learning Institute
Resources are created, often in collaboration with the Natural Learning Initiative’s interdisciplinary partners, to support technical assistance, professional development, and generally to promote the importance of the natural environment in the daily experience of all children. Please use and share.

Visit:
https://naturalearning.org/resources/
Please Share This Free Resource

Preschool: Owners, Teachers, Parents

Government Agencies working with Early Child Care Centers

Nonprofits working with Early Child Care Centers

Extension: Specialists, Agents & Volunteers