



GROWING MINDS: A PRACTICAL GUIDE TO SCHOOL URBAN FARMING

Kristopher Rutherford

Copyright

© 2024 Kristopher Rutherford

This work is licensed under the Creative Commons Attribution-NonCommercial 4.0 International License (CC BY-NC 4.0).

This means you are free to:

- Share — copy and redistribute the material in any medium or format
- Adapt — remix, transform, and build upon the material

Under the following terms:

- Attribution — You must give appropriate credit to Kristopher Rutherford, provide a link to the license, and indicate if changes were made.
- NonCommercial — You may not use the material for commercial purposes.

No additional restrictions — You may not apply legal terms or technological measures that legally restrict others from doing anything the license permits.

To view a copy of this license, visit: <https://creativecommons.org/licenses/by-nc/4.0/>

Table of Contents

Introduction

School Urban Farming Framework

- Overview
- Needs Assessment
 - Create a Map
 - Who to Engage
 - Resources Needed to Begin Outdoor Farm
 - Resources Needed to Begin Hydroponics Farm
 - Essential Factors and Negative Consequences to Consider
- Initial and Ongoing Funding for an Urban Farming Project
- Develop a Plan
- Choose Crops
 - Outdoor Raised Beds
 - Indoor or Outdoor Hydroponics
- Prepare the Land
 - Preparing Outdoor Raised Beds
 - Preparing Indoor or Outdoor Hydroponic System
- Implement the Program
 - Common Sustainable and Organic Growing Practices
 - Initial Training Considerations for Students and Staff Involved
 - Ensuring Safe and Sufficient Water
 - Basic Plant Growth Guidelines Leveraging Raised Beds
 - Leveraging Hydroponics
- Monitor Progress
 - What to Monitor
 - Managing Pests
 - Common Plant Disorders & Management
- Harvest Day Techniques for Quality, Efficiency, and Food Safety
- Evaluate the Program

6-Week Program Guide

- Week 1: Getting Started
 - Activities
 - Garden Preparation Brigade
 - Starting Lettuce Seeds in Cardboard Trays
 - Pre-Assessment Garden Drawing Activity
- Week 2: Planting Basics
 - Activities

- Plant Growth Stages Discussion Circle
 - Garden Ready-Up Rally
 - Garden Observation and Preparation
- Week 3: Transplanting Our Seeds
 - Activities
 - Garden Family Feud
 - Transplanting Lettuce Seedlings
 - Journal Reflection
- Week 4: Observing
 - Activities
 - Beneficial Insects and Pests Icebreaker
 - Garden Observation and Pest Identification
 - Garden Maintenance and Direct Sowing
- Week 5: Nutrition & Gardening Appreciation
 - Activities
 - Nourishing Colors Discussion
 - Journal Sharing and Garden Tasting
 - Garden Maintenance and Observations
- Week 6: Harvest & Celebration
 - Activities
 - Preparing for the Harvest
 - Celebratory Harvest and Salad Tasting
 - Garden Cleanup and Prepping for Next Season

Writing Activities

- Pre-Assessment Garden Drawing
- Weekly Gardening Journal

Handouts

1. The Plant Life Cycle: A Quick Guide for Young Gardeners
2. Essential Guide to Key Plant Families in Gardening
3. Easy Gardening: Insect Control Guide
4. Nature's Helpers: Beneficial Insects in Your Garden
5. Essential Nutrients for Plant Health
6. Healthy Eating with Colors
7. Colorful Choices for Healthy Living
8. Quick Guide to Storing and Cleaning Fresh Vegetables

Introduction

Welcome to "Growing Minds: A Practical Guide to School Urban Farming"! This comprehensive resource bridges the gap between educational theory and hands-on gardening practice, offering schools a blueprint for creating thriving garden programs that engage students and enrich communities.

Whether you're a teacher, administrator, or community leader, this guide provides the tools and knowledge needed to transform unused spaces into vibrant learning environments. The book is structured in two main parts: a detailed urban farming framework that walks you through the essential planning and implementation steps, followed by a ready-to-use six-week curriculum that brings the garden to life through student engagement.

Urban farming in schools does more than just grow plants – it cultivates environmental stewardship, promotes healthy eating habits, enhances STEM education, and builds community connections. This guide demystifies the process of starting and maintaining a school garden, addressing common challenges while highlighting opportunities for meaningful learning experiences.

From conducting initial site assessments to celebrating the first harvest, this book offers practical solutions, clear guidelines, and adaptable activities that can be tailored to your school's unique needs and resources. Whether you're working with a small container garden or developing a larger growing space, you'll find the strategies and support needed to create a successful and sustainable school gardening program.

Let's grow together as we explore the transformative power of urban farming in education!

School Urban Farming Framework

Overview

Starting an urban farm can be a challenging, but rewarding experience. The school urban farming framework is a comprehensive plan that outlines the steps to start and run a successful urban farm. This plan covers everything from conducting a needs assessment to implementing the program and monitoring progress.

The plan begins by identifying the need for an urban farm, and how to assess the resources required to start both an outdoor raised bed farm and an indoor hydroponics farm. Essential factors and negative consequences are also considered to ensure that the project is feasible and sustainable in the long run. The plan also includes information on initial and ongoing funding for the project, which is crucial to its success.

The plan then covers choosing crops, preparing the land, and implementing the program. The focus is on common sustainable and organic growing practices to ensure the health and productivity of the crops. Initial training considerations for students and staff involved are also discussed, as well as ensuring safe and sufficient water. Harvest day techniques for quality, efficiency, and food safety are also covered to ensure that the produce is of the highest quality. Finally, the plan includes instructions on how to evaluate the program to determine its success and identify areas for improvement.

Needs Assessment

Before starting an urban farm, it is important to assess the needs of the community and the resources available. This process involves identifying the reasons for starting the farm, determining the target audience, and assessing the resources and funding needed to get the project off the ground. By evaluating these factors, you can make informed decisions and create a successful urban farming project that benefits the community.

Create a Map

The map will need to include some of the following to get a good understanding of the school community.

- Available land: Identify areas of land that may be suitable for growing crops, such as public parks, vacant lots, or rooftop spaces.
- Water sources: Locate sources of water, such as rainwater, municipal or stormwater runoff systems, that may be used for irrigation.
- Sun exposure: Determine the amount of sunlight that each potential site receives, as different crops may have different light requirements.
- Soil quality: Evaluate the soil quality of potential growing sites, as some areas may have soil that is contaminated or otherwise unsuitable for growing crops.
- Infrastructure: Map out existing infrastructure, such as roads, buildings, and sidewalks, as well as any utility lines, such as power and water, that may impact the program.

- Climate: Consider the climate in Indianapolis, including average temperatures, precipitation, and wind patterns, as these factors can affect crop growth and production.
- Demographics: Review demographic data for the downtown Indianapolis area, including population density, income levels, and cultural background, to understand the potential market for the program's produce.
- Community resources: Identify community resources that may be useful for the program, such as community gardens, farmers' markets, or local non-profit organizations that support urban agriculture.

Who to Engage

- School administration: The school administration should be involved in the needs assessment process to ensure that the project aligns with the school's overall mission and goals. They can provide information about available resources, such as land and water, as well as any constraints or regulations that may impact the program.
- Teachers and students: Teachers and students can provide valuable input about their interest and involvement in the program, as well as their needs and expectations for the program. They can also help to identify any opportunities for integrating the program into the curriculum.
- Community members: Community members, including local residents, business owners, and community organizations, should be engaged in the needs assessment process to ensure that the program is well-received and has support in the community. They can also provide valuable insights into the local growing conditions, market demand, and other factors that may impact the program.
- Urban agriculture experts: Urban agriculture experts, such as local farmers, extension agents, and non-profit organizations, should be engaged to provide information and advice on best practices and strategies for starting and maintaining an urban farm.
- Government agencies: Relevant government agencies, such as the local Department of Parks and Recreation, Department of Public Works, and Department of Health, should be engaged to understand any regulations or requirements for starting an urban farm in the area.

Resources Needed to Begin Outdoor Farm

- Garden tools:
 - Shovels, hoes, and rakes for preparing and maintaining the soil.
 - Pruning shears for harvesting crops and maintaining plants.
 - Wheelbarrow for moving soil and compost.
 - Watering cans and hose for watering plants.
- Irrigation equipment:

- Drip irrigation systems for providing a consistent water supply to crops.
 - Sprinklers for larger areas or for irrigating taller crops.
 - Hoses and fittings for connecting the irrigation system.
- Protective gear:
 - Gloves for protecting hands from sharp tools and plant materials.
 - Sunscreen and hats for protecting skin from the sun.
 - Long pants and sleeves for protecting skin from insects and thorns.
- Planting equipment:
 - Hand trowel for planting seedlings and small plants.
 - Bulb planter for planting bulbs and other larger plants.
 - Transplanter for moving seedlings and small plants to their final locations.
- Materials for building raised beds:
 - Lumber or other materials for building the bed frames.
 - Soil, compost, and fertilizer for filling the beds.
 - Weed cloth and mulch for suppressing weeds and conserving moisture.
- Other equipment:
 - Tarp or other covering material for protecting crops during inclement weather.
 - Stakes and twine for training and supporting tall crops.
 - Scale for measuring and tracking crop yields.
 - Thermometer for monitoring ambient temperature.
 - Rain gauge to estimate total rainfall for a given period.

Resources Needed to Begin Hydroponics Farm

- Hydroponic systems:
 - Plastic containers or jars for growing plants.
 - Hydroponic solution, such as water and nutrients, for nourishing the plants.
 - Water and nutrient reservoirs for holding the hydroponic solution.
- Grow lights:
 - LED grow lights or fluorescent lights for providing the necessary light to grow the plants.

- Light timers and/or ballasts for controlling the light cycle.
- Pumps and tubing:
 - Submersible pumps for circulating the hydroponic solution.
 - Tubing for connecting the pumps, air pumps, and containers.
 - Air pumps and tubing for oxygenating the hydroponic solution.
- Climate control equipment:
 - Heaters, fans, and air conditioners for maintaining optimal temperature and humidity levels for the plants.
 - Thermometers and hygrometers for monitoring temperature and humidity levels.
- Soil-less growing media:
 - Rockwool, coconut coir, or perlite for supporting the plants.
 - Peat moss or vermiculite for retaining moisture in the growing media.
- Nutrient solution:
 - Hydroponic nutrients specifically formulated for the plants being grown.
 - pH test kit for monitoring and adjusting the pH of the nutrient solution.
- Miscellaneous:
 - Trays for collecting excess water and preventing spills.
 - Plant labels for identifying the different plants.

Essential Factors and Negative Consequences to Consider

- Land availability: It is important to assess the availability of suitable land for the urban farm. Consider factors such as the size and location of the land, as well as any zoning restrictions or regulations that may impact the use of the land.
- Water resources: Access to water is critical for the success of an urban farm. Assess the availability of water for irrigation, as well as the quality and cost of the water.
- Climate and weather: The climate and weather conditions in the area can impact the success of the urban farm. Consider factors such as temperature, precipitation, and wind patterns.
- Soil quality: The quality of the soil can impact the growth and yield of the crops. Consider factors such as soil composition, fertility, and pH levels.
- Market demand: Assess the demand for locally grown food in the community and determine the potential market for the crops grown on the urban farm.

- Funding and resources: Consider the funding and resources required to start and maintain the urban farm, such as equipment, supplies, and staffing.
- Community support: Engage the community in the needs assessment process to assess support for the urban farm and ensure that the project aligns with community values and goals.
- Environmental impact: Consider the potential environmental impact of the urban farm, such as water usage, nutrient runoff, and pesticide use, and develop plans to minimize negative impacts.

Initial and Ongoing Funding for an Urban Farming Project

Starting an urban farm at a school can be a challenging process, especially with limited financial resources available. However, there are several strategies that can help pay for the project:

- Grants: Research and apply for grants from government agencies, foundations, and non-profit organizations that support urban agriculture and education initiatives.
- Crowdfunding: Utilize crowdfunding platforms to raise funds from a large number of individuals who support the project.
- Partnerships and sponsorships: Partner with local businesses and organizations that are committed to sustainable agriculture and education. They may be willing to provide funding or in-kind support.
- Donations: Reach out to members of the community, local farmers, and other supporters of urban agriculture to solicit donations.
- Volunteer support: Utilize the support of volunteers to help with the setup and maintenance of the urban farm. This can help reduce the need for paid staff and reduce costs.
- Sales of produce: Sell the produce grown on the urban farm to local restaurants, farmers markets, and through a community-supported agriculture (CSA) program.
- Sponsored events: Organize fundraising events such as plant sales, workshops, and farm-to-table dinners to generate additional revenue.

Develop a Plan

Based on the needs assessment, create a comprehensive plan that includes the goals, objectives, and timeline for the program, as well as the roles and responsibilities of all involved parties. The following is a working plan for setting up an urban farm.

- Goals and Objectives:
 - Goal: To establish a sustainable and successful urban farm program that provides educational and community benefits.
 - Objectives:

- To provide hands-on learning opportunities for students in areas such as agriculture, science, and sustainability.
 - To produce high-quality, fresh produce for local consumption.
 - To engage the local community in the urban farming process and promote healthy living.
 - To minimize environmental impact and promote sustainable agricultural practices.
 - To generate revenue to support the ongoing operation and growth of the urban farm program.
- Timeline:
 - Month 1-2: Conduct a needs assessment and secure funding and resources.
 - Month 3-4: Finalize the design and layout of the urban farm, including the selection of crops and hydroponic systems.
 - Month 5-6: Install the hydroponic systems and prepare the farm for planting.
 - Month 7-8: Plant the first crops and initiate the urban farming program.
 - Month 9-12: Monitor and maintain the urban farm, including the growth of the crops, water and nutrient levels, and pest management.
 - Month 13-24: Evaluate the success of the program, make necessary adjustments, and continue to monitor and maintain the urban farm.
- Roles and Responsibilities:
 - Project Manager: The project manager will be responsible for overseeing the entire urban farm program, including the needs assessment, funding and resource acquisition, and implementation of the plan.
 - School Officials: School officials will provide support and guidance to the project manager and will help secure resources and funding for the program.
 - Teachers: Teachers will work with the project manager to integrate the urban farm program into the school curriculum and will provide hands-on learning opportunities for students.
 - Students: Students will participate in the hands-on learning opportunities provided by the urban farm program and will help maintain the farm and harvest the crops.
 - Community Members: Community members will be engaged in the urban farming process, including volunteering, supporting the farm through purchases of produce, and participating in educational workshops and events.
- Evaluation and Monitoring:

- Regular monitoring of the success of the urban farm program will be conducted to ensure that it is meeting its goals and objectives.
- Evaluation metrics will include the production and sale of crops, student engagement and learning outcomes, community involvement, and financial viability.
- Feedback from students, teachers, community members, and other stakeholders will be regularly sought and incorporated into the program as necessary.

Choose Crops

When starting an urban farm, one of the crucial steps is selecting the right crops to grow. It is essential to consider the growing conditions, local climate, and soil quality, as well as the demand and marketability of the crops. Choosing the right crops can help maximize yield, increase profitability, and provide a sustainable and diverse food source. Before making a decision, it is recommended to conduct market research and evaluate the growing conditions in the urban farming space.

Outdoor Raised Beds

Crop list that can be grown on an urban farm in Indiana, based on local climate, fertile soil, and raised beds with drip irrigation:

- Leafy Greens: Lettuce, spinach, kale, and other greens are well-suited to local growing conditions and are in high demand.
- Herbs: Basil, parsley, cilantro, and other herbs are easy to grow and are highly valued for their culinary and medicinal properties.
- Root Crops: Carrots, beets, radishes, and other root crops are well-suited to raised beds and are in high demand.
- Tomatoes: Tomatoes are a staple crop in many urban gardens and are well-suited to raised beds with drip irrigation.
- Peppers: Bell peppers, chili peppers, and other pepper varieties are popular crops that can be grown in raised beds with drip irrigation.
- Squash: Squash, including zucchini, yellow squash, and other summer squashes, are well-suited to local growing conditions and are in high demand.
- Beans: Green beans, snap peas, and other legume crops are easy to grow and are in high demand.
- Cucumbers: Cucumbers are a popular crop that can be grown in raised beds with drip irrigation.
- Strawberries: Strawberries are well-suited to raised beds and are in high demand.
- Melons: Watermelons, cantaloupes, and other melons are well-suited to local growing conditions and are in high demand.

Indoor or Outdoor Hydroponics

Crop list that can be grown on an urban farm in Indiana, based on ideal lighting conditions and hydroponics, with supplemental drip irrigation:

- Leafy Greens: Lettuce, spinach, kale, and other greens are well-suited to hydroponic growing conditions and are in high demand.
- Herbs: Basil, parsley, cilantro, and other herbs are easy to grow in hydroponic systems and are highly valued for their culinary and medicinal properties.
- Microgreens: Microgreens, such as wheatgrass, pea shoots, and sunflower sprouts, are popular hydroponic crops that are in high demand.
- Tomatoes: Tomatoes are a staple crop in many urban hydroponic gardens and are well-suited to hydroponic systems.
- Peppers: Bell peppers, chili peppers, and other pepper varieties are popular hydroponic crops that can be grown in hydroponic systems.
- Cucumbers: Cucumbers are a popular hydroponic crop that can be grown in hydroponic systems.
- Strawberries: Strawberries are well-suited to hydroponic systems and are in high demand.
- Radishes: Radishes are a hydroponic crop that are well-suited to hydroponic systems and are in high demand.

Prepare the Land

In order to create a successful urban farm, preparing the land is crucial. This involves selecting an appropriate site, assessing its soil and water conditions, and taking necessary steps to ensure it is ready to support healthy crop growth. It is important to consider factors such as light, drainage, and nutrient availability when choosing a location and preparing the soil. Proper preparation of the land will help lay the foundation for a thriving and productive urban farm.

Preparing Outdoor Raised Beds

- Site Assessment: Conduct a thorough assessment of the site to determine the soil type, existing vegetation, and any potential obstacles or challenges that need to be addressed.
- Clearing and Tilling: Clear the site of any existing vegetation and till the soil to a depth of at least 12 inches. This will help to loosen the soil and allow for proper root growth.
- Soil Amendment: Add organic matter, such as compost or well-rotted manure, to the soil to improve its fertility and structure. If necessary, have the soil tested to determine its pH and nutrient levels, and add any necessary amendments to bring it into the ideal range for plant growth.

- Irrigation System Installation: Install a drip irrigation system to provide consistent and efficient watering for the crops. This will include installing the main line, emitters, and control valves, as well as connecting the system to a water source.
- Building Raised Beds: Build raised beds for the crops using sturdy materials, such as cedar or treated lumber. The beds should be at least 12 inches high and 2-3 feet wide to allow for easy access and planting.
- Soil Preparation: Mix a layer of compost and soil amendment into the top layer of soil in the raised beds to further improve fertility and structure.
- Mulching: Apply a 2-3 inch layer of organic mulch, such as straw or leaves, over the top of the soil in the raised beds to conserve moisture, regulate soil temperature, and suppress weed growth.
- Install Supports: Install supports, such as trellises or stakes, as necessary to support tall crops, such as tomatoes or beans.
- Irrigation System Testing: Test the irrigation system to ensure that it is functioning properly and providing adequate water coverage to the crops.

Preparing Indoor or Outdoor Hydroponic System

- Site Assessment: Conduct a thorough assessment of the site to determine the ideal location for the hydroponic system, taking into account factors such as lighting, temperature, and water access.
- Irrigation System Preparation: Prepare the irrigation system by setting up the water reservoirs, pumps, and tubing necessary for the hydroponic system. This will also involve installing a water treatment system, if necessary, to ensure that the water is clean and free of contaminants.
- Building the Hydroponic System: Build the hydroponic system using appropriate materials, such as plastic or glass containers, net cups, and air stones, to hold the plants and support their growth. The system should be designed to allow for proper water flow and oxygenation, and to ensure that the plants receive the proper amount of light and nutrients.
- Filling the Reservoirs: Fill the water reservoirs with a nutrient solution specifically formulated for hydroponic growing, following the manufacturer's instructions.
- Planting: Plant the seeds or seedlings in the hydroponic system, following the instructions for each specific crop.
- Monitoring: Monitor the hydroponic system regularly to ensure that the water level, temperature, and nutrient levels are within the proper range for each crop. Make any necessary adjustments to ensure that the plants receive the proper conditions for growth.
- Irrigation System Testing: Test the irrigation system to ensure that it is functioning properly and providing adequate water and nutrient coverage to the crops.

Implement the Program

Implementing a successful urban farm program requires careful planning and execution. In this phase, you will bring your plans to life and set the foundation for ongoing growth and success. From establishing growing techniques, to providing initial training to involved students and staff, this phase is critical in ensuring your farm's long-term success.

Common Sustainable and Organic Growing Practices

- Crop Rotation: Regularly rotating crops within the farm to improve soil health and reduce the buildup of pests and diseases.
- Composting: Using compost to amend soil, reduce waste, and improve soil health. Compost can be made from a variety of organic materials, such as vegetable food scraps, yard waste, and previous crop plant matter.
- Cover Cropping: Using cover crops between growing seasons to improve soil health, reduce soil erosion, and control weeds.
- Natural Pest Management: Using natural methods, such as companion planting and attracting beneficial insects, to manage pests and diseases.
- Irrigation Management: Implementing water-saving techniques, such as drip irrigation and mulching, to conserve water and prevent soil erosion.
- Minimizing Chemical Use: Minimizing the use of synthetic fertilizers and pesticides, and using organic methods whenever possible.
- Soil Testing: Regularly testing soil to monitor fertility levels and to ensure that the soil is healthy and able to support plant growth.
- Crop Selection: Choosing crops that are well-suited to local growing conditions, including temperature, light, and soil, to minimize inputs and increase yields.

Initial Training Considerations for Students and Staff Involved

When starting an urban farm at a school, initial training considerations for students and staff include:

- Basic plant biology and physiology: Understanding how plants grow, how they absorb nutrients, and how they interact with their environment is critical to successful urban farming.
- Soil science and hydroponics: Understanding the soil conditions that are optimal for growing plants and the principles of hydroponic growing will help students and staff effectively manage the urban farm.
- Urban farming practices: Understanding the specific challenges of urban farming, such as pest management, soil preparation, and crop selection, is important for ensuring success.
- Irrigation: Understanding how to set up and maintain an irrigation system, including the use of drip irrigation, is crucial for maintaining healthy plants.

- Maintenance: Understanding the routine maintenance tasks involved in running an urban farm, such as pruning, trellising, and staking, is important for maintaining healthy crops and prolonging their lifespan.
- Harvesting and post-harvest handling: Understanding when and how to harvest crops, as well as the best practices for storing and selling produce, is essential for ensuring the success of the urban farm.

Ensuring Safe and Sufficient Water

To grow healthy plants, clean water is essential. Municipal water sources may contain chemicals and impurities harmful to plants, so filtration or using rainwater is recommended. A filtration system can ensure clean water for plants, while capturing and storing rainwater conserves water and provides a chemical-free source. Implementing these strategies will ensure plants receive the quality water they need to thrive.

Water Filtration from Municipal Water Sources

- Choose the right filtration system: A multi-stage filtration system is required to remove chlorine, chloride, and other impurities from municipal water sources. This system should include a sediment filter and an activated carbon filter.
- Gather materials: You will need a storage tank, a pump, filters, tubing, activated carbon, and any other materials required to construct the filtration system.
- Build the filtration system: Connect the sediment filter and activated carbon filter in series, with the sediment filter installed first to remove larger particles and the activated carbon filter installed next to remove chlorine and other chemicals.
- Install the filters: Connect the filters to the pump and tubing, and then connect the tubing to the storage tank. The water will pass through the filters and then be stored in the tank for later use.
- Test the water: Before using the water for irrigation, it's important to test it for chemical and mineral content. This will help you determine if the filtration system is working effectively and if any additional steps are necessary to improve water quality.
- Use the filtered water: Once the water quality has been verified, use it for irrigation. To maintain optimal water quality, regularly clean and replace the filters as needed.

Collecting Rainwater

Collecting rainwater is an important aspect of sustainable urban farming, as it helps conserve resources and reduces the dependence on municipal water sources. Here is a step-by-step process for collecting and storing rainwater:

- Check the quality of the rainwater periodically.
- Place a rain barrel or larger storage container under a gutter downspout to ensure that it's collecting clean water.
- Screen the opening of the container to prevent debris and pests from entering.

- Keep the container covered to maintain the quality of the water.
- Add a spigot or hose bib to the container for easier access to the water.

It's important to follow these steps to ensure that the collected rainwater is safe and suitable for use in the urban farm.

Basic Plant Growth Guidelines Leveraging Raised Beds

Crop	Optimal Sunlight	Optimal Companion Plants
Leafy Greens	Full Sun to Part Shade	Root crops, Brassica Family
Herbs	Full Sun to Part Shade	All crops except Nightshades
Root Crops	Full Sun	Leafy Greens, Brassica Family
Tomatoes	Full Sun	Herbs, Marigolds
Peppers	Full Sun	Herbs, Eggplants
Squash	Full Sun	Corn, Beans
Beans	Full Sun	Corn, Squash
Cucumbers	Full Sun	All crops except Nightshades
Strawberries	Full Sun to Part Shade	Leafy Greens, Brassica Family
Melons	Full Sun	Corn, Squash

Note: This is a general guide and the conditions may vary depending on the specific climate and microclimate of the growing location.

Leveraging Hydroponics

Plant Category	Grow Guide
Leafy Greens	<ul style="list-style-type: none">• Grow in a nutrient-rich solution, pH range of 5.5 to 6.5• High light intensity and consistent temperature (60-75°F) is important• Maintain consistent humidity (50-70%)• Harvest when leaves reach desired size
Herbs	<ul style="list-style-type: none">• Grow in a nutrient-rich solution, pH range of 6.0 to 7.0• High light intensity and consistent temperature (60-75°F) is important• Maintain consistent humidity (50-70%)• Harvest leaves when they reach desired size
Microgreens	<ul style="list-style-type: none">• Grow in a nutrient-rich solution, pH range of 5.5 to 6.5• High light intensity is important for seed germination• Maintain consistent temperature (70-75°F)• Harvest microgreens when cotyledons have fully developed
Tomatoes	<ul style="list-style-type: none">• Grow in a nutrient-rich solution, pH range of 5.5 to 6.5• High light intensity is important for strong stem and foliage growth• Maintain consistent temperature (65-75°F)• Pollinate manually to ensure fruiting
Peppers	<ul style="list-style-type: none">• Grow in a nutrient-rich solution, pH range of 5.5 to 6.5• High light intensity is important for strong stem and foliage growth• Maintain consistent temperature (65-75°F)• Pollinate manually to ensure fruiting
Cucumbers	<ul style="list-style-type: none">• Grow in a nutrient-rich solution, pH range of 5.5 to 6.5• High light intensity is important for strong stem and foliage growth• Maintain consistent temperature (65-75°F)• Pollinate manually to ensure fruiting

It is important to keep in mind that hydroponic growing can have different requirements for each type of plant, and specific plants may require different growing conditions to ensure optimal growth. Therefore, it is recommended to research specific plants to determine the best growing conditions for each.

Monitor Progress

Effective monitoring and management of the urban farm is critical for success. Regular monitoring of various aspects of the farm, from the health of the plants to environmental conditions, helps identify potential problems early and prevent significant damage. By taking a proactive approach, urban farmers can ensure their crops thrive and provide a sustainable source of fresh produce.

What to Monitor

- Plant health: Check the overall appearance and growth of the plants regularly. Look for signs of stress, such as yellowing leaves or stunted growth.
- Nutrient levels: Monitor the pH and nutrient levels of the hydroponic solution or soil to ensure that plants are receiving the right balance of nutrients.
- Environmental conditions: Monitor temperature, humidity and light levels to ensure they are within optimal ranges for each crop.
- Pest presence: Regularly inspect the plants for signs of pest infestations, such as chewed leaves or webbing.
- Disease presence: Look for signs of common plant diseases, such as powdery mildew or root rot, and take action to prevent further spread.

Managing Pests

- Prevention: Practice good sanitation and use crop rotation to reduce the risk of pest infestations.
- Natural controls: Use natural methods to control pests, such as releasing beneficial insects or using diatomaceous earth.
- Pesticides: As a last resort, use environmentally-friendly pesticides to control pests.*

*It is important to follow all local, state, and federal regulations regarding the use of pesticides and other chemicals in urban agriculture. Consult with local extension services or professional agricultural experts for specific recommendations and guidelines for your area.

Common Plant Disorders & Management

- Nutrient deficiency: Address nutrient deficiencies by adjusting the pH and nutrient levels in the hydroponic solution or soil.
- Light stress: Provide adequate light or adjust light intensity to prevent light stress.
- Over or under watering: Regularly monitor soil moisture levels and adjust watering accordingly.

- Pest infestations: Use the methods listed in the “Managing Pests” section to control pest infestations.
- Disease outbreaks: Implement preventative measures and treat diseased plants promptly to prevent further spread.

Harvest Day Techniques for Quality, Efficiency, and Food Safety

Harvesting is an important aspect of urban farming and it's important to prioritize quality, efficiency, and food safety. To achieve this, having proper facilities and techniques in place on harvest day is crucial. The following details outline the necessary spaces and steps for a successful harvest.

- Staging Produce in Shade: To prevent damage to delicate produce and to protect it from the heat, it is important to stage the produce in a shaded area before washing. This helps to keep the produce fresh and reduces the risk of spoilage.
- Spray Area: A spray area equipped with hoses or other washing equipment is necessary for thoroughly washing produce before packing. This helps to remove any dirt, debris, or pesticide residue.
- Dunk Tanks for Cleaning and Hydro-cooling: Dunk tanks are a key component of the wash-pack area as they provide a way to clean and cool produce quickly. This helps to maintain the quality and freshness of the produce, while also reducing the risk of spoilage.
- Drying Area: A designated drying area with wire top tables and a salad spinner is essential for removing excess water from the produce after washing. This helps to prevent the growth of bacteria and other harmful microorganisms.
- Table or Counter for Packing: A sturdy table or counter is necessary for packing the produce into containers for distribution. It should be cleaned and sanitized regularly to maintain food safety standards.
- Cold Storage: Finally, cold storage is a must for preserving the quality and freshness of the produce. Proper storage temperature and humidity levels are key to maintaining the shelf life of the product.

Evaluate the Program

An evaluation of your urban farm program is crucial to understand its impact and to identify areas for improvement. Here are a few steps to help you evaluate your program:

- Assess the yield and quality of your crops: This will give you an idea of the overall performance of your farm, including which crops are thriving and which ones may need improvement.
- Analyze the financials: Evaluate your expenses and revenues to determine if your urban farm is economically sustainable. This information will help you make decisions about the future of your program.

- Evaluate the community impact: Survey your customers, neighbors, and other stakeholders to gauge their thoughts and opinions on the urban farm. This will give you insight into the social and environmental impact of your program.
- Consider environmental sustainability: Evaluate the energy, water, and resource use of your farm to determine its overall sustainability.
- Reflect on the farm management and operations: Review your processes, protocols, and procedures to identify areas for improvement and increase efficiency.

By conducting a thorough evaluation, you can assess the overall success of your urban farm program and make informed decisions about its future. Regular evaluations can help you continually improve your program and maximize its impact in your community.

6-Week Program Guide

This dynamic six-week after-school program guide transforms gardening theory into engaging practice, offering a structured yet flexible approach to hands-on learning. Each week builds upon previous knowledge while introducing new concepts, creating a comprehensive journey from seed to harvest that maintains student interest and enthusiasm throughout.

The program begins with foundational activities that connect students to their growing space and culminates in a celebratory harvest of their own fresh produce. Weekly sessions combine practical gardening skills with environmental education, nutrition awareness, and scientific observation. Through carefully designed activities, discussions, and reflection exercises, students develop not just gardening expertise, but also critical thinking skills, environmental awareness, and a deeper appreciation for sustainable food systems.

Each week's plan includes clear learning objectives, detailed activity instructions, material lists, and adaptable time frames that can be modified to fit your specific needs. Supplementary handouts and worksheets reinforce learning while creating valuable documentation of student progress. Whether you're an experienced educator or new to garden-based learning, this guide provides the structure and support needed to create meaningful outdoor learning experiences.

Week 1: Getting Started

Students kickstart their gardening journey with a Garden Preparation Brigade, begin growing lettuce seeds in cardboard trays, and reflect on their initial gardening understanding through a "Pre-Assessment Garden Drawing", setting a hands-on foundation for the program.

Starter Video

- [High Tech Urban Farming on Indianapolis' east side](#)
 - <https://www.youtube.com/watch?v=DAiGTWSggps&t=10s&pp=ygUSdXJiYW4gZmFybSBpbmRpYW5h>

Activities

Activity: Garden Preparation Brigade

To immerse students in the garden setting by engaging them in initial garden preparation tasks. This hands-on activity aims to provide a sense of ownership, foster teamwork, and lay a practical foundation for the gardening program ahead.

Materials Needed

- Garden gloves.
- Small hand rakes, trowels, and pruners.
- Compost and soil amendments (if needed).
- Stakes and string for marking planting areas.
- Waste bags or bins for collecting debris, such as a compost pile.

Activity Breakdown

Garden Exploration

- Take the students on a brief tour of the garden, identifying existing plants, structures, and areas that need attention.

Team Formation

- Divide the students into small teams, each with a specific task. Rotate the tasks among teams between the two sessions to ensure varied experiences.

Task Assignments

1. Weeding Warriors:

- Task: Identify and pull out weeds, old crops, and any other unwanted plants.
- Learning Element: Briefly explain how to identify common weeds and the importance of weeding for garden health.

2. Soil Sleuths:

- Task: Loosen the soil using hand rakes and trowels, remove any debris, and prepare the soil for planting.
- Learning Element: Discuss soil texture, structure, and why loose, aerated soil is vital for plant growth.

3. Compost Crusaders:

- Task: Add compost or soil amendments as needed, and mix them lightly into the topsoil.
- Learning Element: Introduce compost, its benefits, and how it nourishes the soil and plants.

4. Plot Planners:

- Task: Mark out the planting areas using stakes and strings, or create labels/signs for designated planting spots.
- Learning Element: Discuss the importance of planning and spacing in a garden.

Reflection and Discussion

- At the end of the sessions, gather the students and discuss what they did, what they learned, and how they feel about the garden now. Encourage them to share their experiences and observations.

This activity is designed to be engaging, educational, and action-oriented, giving the students a taste of gardening right from the outset. It also sets the stage for a well-organized and well-prepared garden, ready for the students to dive deeper in the following weeks.

Activity: Starting Lettuce Seeds in Cardboard Trays

Materials Needed

- Cardboard seed starting trays
- Loose, pre-moistened soil
- Lettuce seeds
- Watering can or spray bottle
- A shallow container to hold the trays
- A container to hold the soil or bag of soil

- Optional: clear plastic wrap or a plastic dome for covering trays

Procedure

1. Preparation:

- Ensure that your cardboard seed starting trays are clean and free from any debris.
- If your soil isn't already moist, mix it with a little water until it has the consistency of a wrung-out sponge. It should be damp but not soggy.

2. Filling Trays:

- Carefully fill each cell of your cardboard trays with the pre-moistened soil.
- Gently press down the soil in each cell to remove any air pockets but do not compact it too much as lettuce seeds need a loose and aerated soil structure for optimal germination.

3. Planting Seeds:

- Place 2-3 lettuce seeds on the surface of the soil in each cell.
- Lightly press the seeds into the soil using a flat tool or your finger. Lettuce seeds need light to germinate, so they should not be buried deep. A slight contact with the soil is sufficient.

4. Initial Watering:

- Using a watering can with a gentle flow or a spray bottle, lightly water the surface of the soil to ensure good seed-to-soil contact.
- Avoid dislodging the seeds from the soil.

5. Placement:

- Place the filled trays in a shallow container to catch any excess water.
- If the weather permits, place the container with the trays outside during the day to allow the seeds to harden off. Ensure the location receives gentle sunlight and is protected from strong winds.
- If it's difficult to water them outside or if the weather is unfavorable, keep the trays indoors near a sunny windowsill.

6. Covering (Optional):

- Cover the trays with clear plastic wrap or a plastic dome to maintain humidity, which can be beneficial for germination.
- Remember to remove the cover once you see the first sprouts, usually within 7-10 days.

7. Ongoing Care:

- Check the soil moisture daily and keep it consistently damp using a spray bottle or a gentle pour of water. Avoid over-watering as it can lead to damping off disease.
- Once the seedlings have sprouted, ensure they receive adequate light. If indoors, consider using a grow light to provide the necessary light exposure.

8. Transplanting:

- By week 3, your seedlings should have at least two sets of true leaves and be ready for transplanting into the garden.
- Cardboard seedling cells can be transplanted into the soil directly.
 - If using plastic seedling cells, gently remove the seedlings, keeping as much soil around the roots as possible, and transplant them into the prepared garden beds.

● Hardening Off (if not already done):

- Before transplanting, gradually expose the seedlings to outdoor conditions over a few days, increasing the amount of time they spend outside each day to acclimate them to the outdoor environment.

This step-by-step process should guide you through seed starting in cardboard trays, leading to healthy lettuce seedlings ready for transplanting in week 3 of your gardening program.

Activity: Pre-Assessment Garden Drawing Activity

The "Pre-Assessment Garden Drawing" activity aims to gauge students' initial perceptions and understanding of a garden, allowing them to express their creativity and share their prior experiences or expectations regarding gardening.

Activity Explanation

1. Introduction:

- Briefly introduce the activity, explaining that it's a pre-assessment to understand what they already know or imagine about gardens.

2. Drawing Instructions:

- Hand out the "Pre-Assessment Garden Drawing" worksheets to each student.
- Encourage students to draw a garden as they envision it, incorporating elements like plants, flowers, vegetables, fruits, insects, tools, or any other garden-related items.

3. Reflection:

- Once the drawings are complete, ask students to fill out the reflection questions on the worksheet. This part helps to understand their thought process and any prior gardening experiences they might have.

4. Sharing (Optional):

- If time permits, allow students to share their drawings and reflections with the class. This sharing session can foster a sense of community and excitement for the gardening program ahead.

5. Teacher's Review (optional):

- Collect the worksheets, review the drawings and reflections to gain insight into the students' prior knowledge and expectations. This information can be valuable for tailoring the program to meet the students' interests and needs.

6. Feedback:

- Provide feedback or share general observations with the class, appreciating their effort and creativity, and build enthusiasm for the hands-on gardening experiences to come in the following weeks.

This activity not only serves as a baseline assessment of students' knowledge and perceptions but also creates a platform for students to express their creativity and excitement for the upcoming gardening program.

Handouts

- Pre-Assessment Garden Drawing

Week 2: Planting Basics

The fundamentals of plant growth are explored in a discussion circle. A "Garden Ready-Up Rally" further prepares the garden, and students observe the growth of seedlings from Week 1, bridging classroom learning with practical garden preparation and fueling anticipation for Week 3's transplanting activity.

Activities

Ice Breaker Activity: Plant Growth Stages Discussion Circle

Objective:

To familiarize students with the stages of plant growth and encourage open discussion, sharing of prior knowledge, and collaborative learning.

Materials Needed:

- "The Plant Life Cycle: A Quick Guide for Young Gardeners" handout for each student
- Marker board and markers (optional for visual representation)

Procedure:

1. Preparation:
 - Distribute the "The Plant Life Cycle: A Quick Guide for Young Gardeners" handout to each student.
 - Arrange the students in a circle or semicircle where everyone can see each other.
2. Introduction:
 - Briefly introduce the topic of plant growth stages.
 - Explain that the objective is to share, learn, and discuss the journey a plant goes through from seed to maturity.
3. Individual Reflection:
 - Give students a few minutes to read through the handout and think about each stage.
4. Round Robin Sharing:
 - Start with a volunteer or select a student to begin.
 - Have them share something they found interesting or new about one of the stages of plant growth, or a related experience they have had.
 - Proceed clockwise around the circle, giving each student a chance to share.

5. Open Discussion:

- Encourage students to ask questions, share additional thoughts or experiences, and respond to each other's comments.
- As the discussion progresses, jot down key points or draw diagrams on the marker board to visually represent the stages and any interesting observations made by students.

6. Summary:

- Summarize the key points discussed and reiterate the stages of plant growth.
- Encourage students to keep the discussion in mind as they proceed with the gardening activities, and to observe these stages in real time in the garden.

Goal:

This activity aims to not only introduce the students to the stages of plant growth but also to foster a collaborative learning environment where students feel comfortable sharing and discussing their thoughts and experiences. Through this interactive discussion, students will be better prepared to identify and understand the various stages of plant growth as they engage in the gardening program.

Activity: Garden Ready-Up Rally

The aim of this activity is to finalize the garden preparations ensuring a smooth and successful transplanting process in Week 3. The focus remains on teamwork, hands-on engagement, and preparing a conducive environment for the upcoming transplanting phase.

Materials Needed:

- Garden gloves
- Small hand rakes, trowels, and pruners
- Soil amendments (if needed)
- Mulch
- Stakes, strings, and labels/signs for marking planting areas
- Watering cans or hoses with gentle spray settings

Activity Breakdown:

Garden Revisit:

- Take a brief tour to acknowledge the work done in Week 1 and identify areas that need further preparation.

Team Re-Formation:

- Keep students in their teams or shuffle as needed, ensuring they experience a variety of tasks.

Task Assignments:

1. Weeding Warriors:

- Task: A final round of weeding to ensure garden beds are clear of unwanted plants.
- Learning Element: Re-emphasize the importance of a weed-free garden before planting.

2. Soil Sleuths:

- Task: Final soil preparation, including adding any necessary soil amendments and tilling if required.
- Learning Element: Discuss how soil amendments improve soil fertility and structure, preparing it for transplanting.

3. Leveling Legends:

- Task: Ensure the soil surface is level and free from any debris.
- Learning Element: Explain the importance of a level planting area for uniform water distribution and plant growth.

4. Mulching Masters:

- Task: Apply a thin layer of mulch to the soil surface.
- Learning Element: Discuss the benefits of mulching, such as moisture retention and weed suppression.

5. Watering Wizards:

- Task: Water the prepared areas lightly to settle the soil and the mulch.
- Learning Element: Demonstrate proper watering techniques, emphasizing gentle watering to prevent soil erosion.

Reflection and Discussion:

- Reflect on the tasks accomplished and the importance of preparing the garden for the transplanting phase.

The "Garden Ready-Up Rally" aims to encapsulate the anticipation and preparatory work necessary for a successful transplanting process, ensuring the students are ready and the garden is in prime condition for the next phase of their gardening journey.

Activity: Garden Observation and Preparation

Materials Needed:

- Seed trays from Week 1
- Gardening Journal worksheet for each student
- Clipboards and pencils for journaling
- Watering cans or spray bottles

Procedure:

- Seedling Observation:
 - Students will start by observing the seed trays from Week 1. They should note the growth of the lettuce seedlings, any visible changes, and the conditions of the soil and trays.
 - They will fill in the relevant sections of their "Gardening Journal" regarding what they observe.
- Journaling:
 - During or after the garden preparation, have students fill out the Garden Activities section of their "Gardening Journal" describing the tasks they performed, tools they used, and drawing a picture of one activity or tool they used.
- Reflection:
 - Gather the students together to share their observations and what they are looking forward to next week. They can also share their journal entries if they wish.
 - Encourage them to fill out the Reflections section of their Seed to Salad Gardening Journal.
- Next Week Preview:
 - Briefly discuss the activities for Week 3, emphasizing the transplanting of the seedlings into the garden beds. This builds anticipation and prepares them for the next steps in the gardening project.
- Teacher's Note Section:

- Make any necessary notes in the Teacher's Notes section of each student's Seed to Salad Gardening Journal regarding their participation, observations, or any notable occurrences during the activity.

Goal:

Through this activity, students will connect the observations of their seedlings with the real-world application of preparing the garden site. They will also engage in reflection through journaling, fostering a deeper understanding and anticipation for the upcoming transplanting activity in Week 3.

Handouts:

- Gardening Journal
- The Plant Life Cycle: A Quick Guide for Young Gardeners

Week 3: Transplanting Our Seeds

Week 3 is all about deepening our connection with the plant world through hands-on experience and interactive learning. Kicking off with "Garden Family Feud," an engaging icebreaker game, students will solidify their understanding of plant families and their characteristics using the "Essential Guide to Key Plant Families in Gardening." The fun continues as we transplant the tender lettuce seedlings nurtured from Week 1 into the garden, learning the importance of space and care for young plants. Reflections on this process will be captured in journal entries, fostering a reflective practice that celebrates growth and prepares our young gardeners for the exciting journey ahead.

Activities

Ice Breaker Activity: "Garden Family Feud"

Objective:

To engage students in a fun and educational game that builds on the "Essential Guide to Key Plant Families in Gardening" handout, reinforcing their knowledge of plant characteristics and cultivation needs.

Materials Needed:

- "Essential Guide to Key Plant Families in Gardening" handout for each student.
- Whiteboard and markers or a digital slideshow.
- Buzzer or bell for each team (optional).

Procedure:

1. Preparation:

- Review the "Essential Guide to Key Plant Families in Gardening" handout with the students.
- Divide the class into two teams.

2. Game Setup:

- Write down plant family names on the whiteboard or prepare a slideshow with them.
- Explain the rules: You will describe a characteristic or a growing tip, and teams will have to guess which plant family it belongs to.

3. Playing the Game:

- Read out a characteristic or growing tip from the handout. For example, "This plant family has members that are great for fixing nitrogen in the soil."

- The first team to buzz in gets to answer. Correct answers earn points, while incorrect answers give the other team a chance to steal.
- Keep the game light and educational, offering hints if needed.

4. Discussion:

- After the game, discuss the importance of plant families and how understanding their characteristics can help in the garden.
- Encourage students to share any interesting facts they know about the plant families.

5. Summary:

- Recap the key points learned through the game and encourage students to refer to their handouts during their gardening activities.

Goal:

The aim is to create an interactive and memorable learning experience that enhances students' understanding of different plant families and how they can apply this knowledge in their gardening practices.

Activity: Transplanting Lettuce Seedlings

Materials Needed:

- Cardboard seed starting trays from Week 1
- Scissors (for cutting out the seedlings from cardboard trays)
- Measuring tape or ruler
- Stakes and string (for marking planting spots)
- Trowel (for digging holes)
- Watering can, spray bottle or watering hose.
- Garden gloves

Procedure:

- Preparation:
 - Make sure the garden beds are well-prepared with loose, weed-free soil.
 - If not done already, amend the soil with compost to ensure it's rich and fertile.
- Measuring and Marking:

- Explain to the students the importance of spacing when planting, especially for leaf lettuce which needs space to grow.
- Use a measuring tape or ruler to measure and mark the spots where the lettuce seedlings will be transplanted. The spacing should be about 4 to 6 inches apart between plants and rows.
- Use stakes and strings to mark the rows or simply draw lines in the soil with a stick.
- Transplanting:
 - Carefully cut the cardboard around each lettuce seedling using scissors, making sure not to damage the roots.
 - Show the students how to dig a hole with a trowel, place the seedling in, and gently firm the soil around it.
 - Repeat the process for each seedling, following the marked spots for correct spacing.
- Watering:
 - Once all the seedlings are transplanted, water them gently using a watering can or spray bottle. Emphasize the importance of watering to help the seedlings establish in their new environment.
 - Explain to the students that the soil should be kept moist, but not waterlogged, and demonstrate how to check the soil moisture by feeling it.
- Observation:
 - Have the students observe and discuss how the garden looks now with the newly transplanted seedlings.

Activity: Journal Reflection

Materials Needed:

- "Gardening Journal" worksheet for each student
- Clipboards and pencils for journaling

Procedure:

- Reflecting on Transplanting:
 - Have the students reflect on the transplanting activity by answering the questions in the Garden Observations and Garden Activities sections of their journals.
 - Encourage them to draw pictures of the transplanting process, the tools used, or the newly transplanted garden beds in the provided drawing spaces.
- Group Discussion:

- Gather the students for a group discussion on the transplanting process, challenges faced, and what they learned from it.
- Encourage sharing of journal entries and drawings, fostering a collaborative learning environment.
- Looking Ahead:
 - Briefly introduce the students to what they'll be doing in the upcoming weeks, building anticipation and excitement for the next stages of the garden project.
- Teacher's Notes:
 - Make any necessary notes in the Teacher's Notes section of each student's Gardening Journal regarding their participation, observations, or any notable occurrences during the activities.

Handouts:

- Gardening Journal
- Essential Guide to Key Plant Families in Gardening

Week 4: Observing

Through a Beneficial Insects and Pests Icebreaker, students delve into garden ecology. Hands-on Garden Observation and Pest Identification enhance awareness of garden inhabitants. Garden Maintenance and Direct Sowing activities introduce a new planting technique and underscore the importance of regular upkeep, fostering continuous learning in the garden ecosystem.

Icebreaker Activity: Beneficial Insects and Pests Icebreaker

Materials Needed:

- "Easy Gardening: Insect Control Guide" and "Nature's Helpers: Beneficial Insects in Your Garden" information sheets.
- Pictures of common garden pests and beneficial insects (from the information sheets).

Procedure:

- Introduction:
 - Distribute the "Beneficial Insects" and "Pests" information sheets to each student.
 - Briefly introduce the topic of beneficial insects and pests in the garden, explaining their roles and impact on plant growth.
- Picture Matching Icebreaker:
 - Divide students into small groups and hand out pictures of common garden pests and beneficial insects (from the information sheets) to each group.
 - Ask each group to identify and match the pictures with the descriptions provided in the information sheets.
 - Each group presents their matches to the class, explaining why they matched the pictures and descriptions the way they did.
- Discussion:
 - Discuss the importance of beneficial insects and the problems posed by garden pests.
 - Share the benefit of natural pest control, emphasizing the role of beneficial insects in keeping pest populations under control by naturally managing pests without the use of chemicals.
- Reflection:
 - Have students reflect on what they learned in the Reflections section of their Seed to Salad Gardening Journal, noting any new insights about garden ecology and natural pest control.

Activity: Garden Observation and Pest Identification

Materials Needed:

- "Gardening Journal" worksheet for each student
- Clipboards and pencils for journaling
- Magnifying glasses (optional, for closer observation)

Procedure:

- Garden Observation:
 - Have students walk around the garden in small groups or pairs, observing the growth of the lettuce and other plants.
 - Encourage them to look for signs of pests or disease, and any beneficial insects present.
 - If available, magnifying glasses can be used for closer observation of plant leaves, stems, and soil.
- Journaling:
 - Students should fill out the "Garden Observations" section of their "Gardening Journal", noting the growth of their plants, any pests or beneficial insects they identified, and any other observations.
 - In the drawing space provided, they can draw any insects they saw, the damage caused by pests, or other interesting observations.
- Group Discussion:
 - Gather the students to share their observations and discuss common pests and beneficial insects found in the garden.

Activity: Garden Maintenance and Direct Sowing

Materials Needed:

- Watering cans or hoses
- Garden gloves, small hand rakes, and hoes
- Lettuce seeds
- Stakes and string (for marking new planting areas)
- Compost and soil amendments (if needed)

Procedure:

1. Watering Reminder:

- Begin with a reminder about the importance of regular watering, especially as the weather gets warmer.
- Have students check the soil moisture around their plants and water as necessary, demonstrating proper watering techniques.

2. Weeding and Cleanup:

- Divide students into small groups and assign different areas of the garden for weeding and cleanup.
- Explain the importance of removing weeds and keeping the garden tidy for the health of their plants.

3. Direct Sow Experiment:

- Discuss the concept of direct sowing as opposed to transplanting.
- In a designated area, have students prepare the soil by loosening it with hand rakes or hoes, and amending with compost if necessary.
- Show students how to sow lettuce seeds directly into the soil, following the spacing guidelines on the seed packet or as previously instructed.
- Mark the newly sown areas with stakes and strings for easy identification and observation.

4. Observation and Experimentation (optional):

- Explain that they'll be observing the growth of directly sowed lettuce seeds over the summer and possibly into the fall, comparing the growth with the transplanted seedlings from earlier weeks.
- For ambitious programs, introduce the concept of seed saving and how it can be done with some of the lettuce plants.

5. Group Reflection:

- Gather the students and have a brief reflection time where they can share their experiences, observations, and learnings from the day's activity.
- Discuss the importance of regular garden maintenance and how it contributes to a thriving garden.

This activity aims to instill the importance of regular garden maintenance while also introducing a new planting technique. It provides an avenue for ongoing observation, experimentation, and even advanced learning opportunities like seed saving for more ambitious programs. Through this activity, students will engage in hands-on gardening tasks, and gain a deeper understanding of different planting methods and garden maintenance practices.

Handouts

- Gardening Journal
- Easy Gardening: Insect Control Guide
- Nature's Helpers: Beneficial Insects in Your Garden

Week 5: Nutrition & Gardening Appreciation

The "Nourishing Colors Discussion" activity ties plant nutrition to a colorful diet. Garden journal sharing and a tasting activity deepen garden appreciation, while hands-on maintenance, and pest and disease inspection activities foster understanding of essential garden care practices, all building anticipation for the upcoming harvest.

Activities

Icebreaker Activity: Nourishing Colors Discussion

Materials Needed:

- Handouts: "Essential Nutrients for Plant Health", "Healthy Eating with Colors", and "Colorful Choices for Healthy Living"
- Markers and a large whiteboard or poster paper

Procedure:

1. Introduction to Plant Nutrition:
 - Distribute the "Essential Nutrients for Plant Health" handout and briefly explain the key elements essential for plant growth and how these nutrients are beneficial to humans too.
2. Colorful Diet Discussion:
 - Hand out the "Healthy Eating with Colors" and "Colorful Choices for Healthy Living" documents.
 - Explain the nutritional benefits associated with different colored vegetables and fruits, emphasizing how a colorful diet can be a healthy diet.
3. Group Activity: Colorful Nutritional Chart:
 - Divide students into small groups and assign each group a color (e.g., red, green, yellow, etc.).
 - Ask each group to list on the whiteboard or poster paper, the vegetables and fruits of their assigned color, along with the nutrients and health benefits associated with them (referencing the handouts).
4. Discussion:
 - Once all groups have presented, facilitate a discussion on the importance of a balanced, plant-based diet.

- Encourage students to share their thoughts on how they can incorporate more colorful vegetables and fruits into their diets, and how the knowledge of plant nutrition has enhanced their understanding of the foods they consume.

5. Reflection:

- Ask students to reflect on their gardening experience so far and the connection between the health of the soil, the nutrition of the plants, and ultimately, their own nutrition.
- Encourage them to share any personal experiences or changes they might consider making in their dietary choices based on the information learned.

6. Wrap-up:

- Summarize the key takeaways from the discussion and activity, reinforcing the importance of understanding plant nutrition and adopting a more plant-based, colorful diet for better health.

Activity: Journal Sharing and Garden Tasting

Materials Needed:

- Gardening Journals
- Markers and poster paper or a whiteboard
- A clean, sanitized pair of scissors for harvesting
- Clean, sanitized containers or plates for holding the harvested lettuce
- Hand sanitizers or access to hand washing facilities

Procedure:

1. Journal Sharing:

- Arrange students in pairs or small groups.
- Have each student share their "Garden Journals" with their peers, discussing the observations they've made, the tasks they've performed, and their reflections on the gardening process so far.

2. Class Discussion:

- Reconvene as a class and encourage volunteers to share their most interesting or unexpected findings from their journal entries with the entire class.

3. Garden Walk and Final Observations:

- Take the students for a walk in the garden, encouraging them to make final observations on the growth of the lettuce and other plants, the condition of the soil, and the overall health and appearance of the garden.
- Students should fill in the "Garden Observations" section of their journals for Week 5 during this walk.

4. Sampling the Lettuce:

- Demonstrate to students the correct way to harvest a few leaves of lettuce using a clean, sanitized pair of scissors, ensuring minimal damage to the plants.
- Have each student harvest a few leaves of lettuce, placing them in clean containers or plates.
- Ensure students wash or sanitize their hands before tasting the lettuce.
- Encourage students to describe the taste, texture, and appearance of the lettuce in the "Reflections" section of their journals.

5. Anticipating the Harvest:

- Discuss the upcoming harvest in Week 6, explaining what steps will be involved and what they can expect.
- Have students write in the "Reflections" section about what they are looking forward to during the harvest and any ideas they have for using the harvested lettuce.

6. Teacher Reflections:

- After the activity, take some time to fill in the "Teacher's Notes" section in each student's journal, providing feedback on their observations, discussions, and tasting experience.

7. Cleanup:

- Ensure all tools and materials are cleaned and stored properly, and the garden and tasting area are left tidy.

Activity: Garden Maintenance and Observations

Materials Needed:

- Watering cans or hoses
- Garden gloves, small hand rakes, and hoes
- Stakes and string (for marking areas of interest or concern)
- Compost and soil amendments (if needed)
- Clipboard and pencils (for making observations)

Procedure:

- Watering and Soil Moisture Check:
 - Begin with a reminder about the importance of regular watering, especially as the weather continues to warm.
 - Have students check the soil moisture around their plants and water as necessary, using proper watering techniques.
- Weeding and Cleanup:
 - Divide students into small groups and assign different areas of the garden for weeding and cleanup.
 - Discuss the types of weeds they may encounter, referring back to the weed identification guide from Week 3, and how to safely and effectively remove them.
- Observation of Plant Growth:
 - Have students observe the growth of their lettuce plants, both the transplanted ones and those directly sown (if applicable from previous activities).
 - They should note the size, color, and overall health of the plants, marking any areas of concern with stakes and strings.
- Pest and Disease Inspection:
 - Teach students how to look for signs of pest infestations or diseases on their plants.
 - Encourage them to report any findings, and discuss possible solutions or interventions.
- Recording Observations:
 - Provide clipboards and pencils for students to jot down their observations, findings, and any questions they might have.
 - This recorded information can be useful for future reference and learning.
- Group Reflection:
 - Gather the students for a brief reflection time where they can share their experiences, observations, and learnings from the day's activity.
 - Encourage them to discuss any challenges they faced, solutions they proposed, or new things they learned about their garden.

Handouts

- Garden Journal
- Essential Nutrients for Plant Health

- Healthy Eating with Colors
- Colorful Choices for Healthy Living

Week 6: Harvest & Celebration

Celebrating the seed to salad cycle, the week begins with discussions on proper vegetable storage and cleaning, setting the stage for a celebratory harvest. A communal salad tasting follows the harvest, allowing reflections on the program's experiences. The week concludes with a garden cleanup and prep for the next growing season, instilling a sense of responsibility and anticipation for future gardening endeavors.

Activities

Icebreaker Activity: Preparing for the Harvest

Materials Needed:

- Handouts: "Quick Guide to Storing and Cleaning Fresh Vegetables"
- Markers and Poster Paper or a Whiteboard
- Pens or pencils for the students

Procedure:

- Introduction:
 - Begin with a brief discussion about the importance of the day's harvest and the journey the students have been on from seed to salad.
 - Distribute the Purdue Ag Extension handouts to each student and briefly go over the key points in each guide.
- Group Discussion:
 - Divide the students into small groups and assign each group a specific topic from one of the handouts (e.g., cleaning procedures, storage temperatures, etc.).
 - Ask each group to discuss the key takeaways from their assigned topic and come up with a list of tips or a "how-to" guide based on the information in the handouts.
- Presentation:
 - Have each group present their tips or "how-to" guide to the class, encouraging them to explain why these steps are important for maintaining the freshness and safety of the harvested vegetables.
 - Create a collective chart on poster paper or the whiteboard summarizing the key points from each group's discussion.
- Class Reflection:

- Engage the class in a reflection discussion about what they learned from the handouts and the group discussions.
 - Ask questions like:
 - "Why is it important to properly clean and store fresh vegetables?"
 - "What was something new you learned from the handouts?"
 - "How will you apply this knowledge at home or in future gardening projects?"
- Connecting to the Harvest:
 - Briefly discuss how the information from the handouts will be applied during the day's harvesting and salad preparation activity.
 - Encourage students to refer back to the handouts and the collective chart as they participate in the harvest.
- Cleanup:
 - Collect the handouts from the students (or allow them to keep them for future reference), erase the whiteboard or store the poster paper, and ensure the area is tidy before proceeding to the harvesting activity.

Activity: Celebratory Harvest and Salad Tasting

Materials Needed:

- Garden gloves
- Harvesting scissors or pruners
- Harvest baskets or trays
- Washing station with clean water and vegetable brushes
- Salad spinner or clean towels for drying lettuce
- Large bowls or containers for salad preparation
- Salad dressing(s) of choice
- Serving utensils
- Plates, forks, and napkins

Procedure:

- Preparation:
 - Briefly review with students the journey from seed to harvest and the importance of today's activity.

- Ensure all materials are set up and ready for use.
 - Review safety instructions for using scissors or pruners and handling fresh produce.
- Harvesting:
 - Divide students into small, supervised groups.
 - Instruct each group to carefully harvest their lettuce, using scissors or pruners to cut the lettuce at the base, leaving the roots in the soil.
 - Collect the harvested lettuce in baskets or trays, making sure to handle the produce gently to prevent bruising or damage.
- Cleaning and Prepping:
 - Bring harvested lettuce to the washing station.
 - Show students how to properly wash and brush the lettuce to remove any soil or debris.
 - Use a salad spinner or clean towels to gently dry the lettuce.
- Salad Preparation:
 - Transfer cleaned and dried lettuce to large bowls or containers.
 - If desired, add other fresh veggies or salad toppings (e.g., cherry tomatoes, cucumber slices, carrot shavings).
 - Pour salad dressing over the lettuce or serve it on the side, allowing students to add dressing to their liking.
- Salad Tasting:
 - Serve the salad to students on individual plates, along with forks and napkins.
 - Encourage students to taste the fruits of their labor and share their thoughts on the experience.
 - If possible, invite parents, staff, or other classes to join in the tasting celebration.
- Reflection:
 - Gather students for a reflection discussion on the entire gardening experience.
 - Encourage them to share what they learned, what they enjoyed, and how they felt about tasting the salad they grew from seed.
- Cleanup:
 - Ensure all tools are cleaned and stored properly.
 - Dispose of any waste in compost or trash bins.
 - Thank students for their hard work and participation in the program.

Activity: Garden Cleanup and Prepping for Next Season

Materials Needed:

- Garden gloves
- Pruners or scissors
- Weeding tools
- Compost bins or designated compost area
- Seed packets for summer/fall crops or cover crops
- Watering cans or hose
- Tarp or mulch (optional)
- Seed to Salad Gardening Journal (for note-taking)

Procedure:

1. Introduction:
 - Discuss with students the importance of garden cleanup and preparation for the next growing season.
 - Briefly explain the process of composting, the benefits of cover crops, and considerations for summer watering.
2. Harvest and Compost:
 - If there's any remaining lettuce or other crops, have students harvest them.
 - Instruct students on how to properly pull out the spent plants and where to place them in the compost bin/area.
3. Weeding and Tidying Up:
 - Divide students into small groups and assign different areas of the garden for weeding and tidying up.
 - Ensure they remove any weeds, debris, or trash from the garden beds and pathways.
4. Watering Considerations:
 - Discuss the importance of regular watering, especially during the hotter summer months.
 - If possible, set up a watering schedule or system to ensure the garden receives adequate water over the summer.
5. Tarping or Mulching (Optional):

- If certain areas of the garden will not be planted, consider covering the soil with a tarp or applying a layer of mulch to suppress weeds and retain soil moisture.
6. Cleanup:
- Ensure all tools are cleaned and stored properly.
 - Thank students for their hard work and participation in the gardening program, and encourage them to continue gardening and learning about agriculture.

Handouts

- Quick Guide to Storing and Cleaning Fresh Vegetables

Writing Activities

Pre-Assessment Garden Drawing

Name: _____ School: _____

Date: _____

Instructions: Before we start our gardening adventure, we'd like to see what a garden looks like through your eyes. Draw a picture of a garden as you imagine it. You can include plants, trees, flowers, vegetables, fruits, insects, tools, or anything else you associate with a garden. There are no right or wrong drawings, we are just excited to see your creativity!

Drawing Space:

Reflection Questions:

1. What did you include in your garden drawing? Explain why you chose these elements.
-
-

2. Have you ever been to a garden or done gardening before? If so, describe your experience.
-
-

3. What are you most excited to learn or do in our gardening program?

Teacher's Notes: (For teacher's use only)

Weekly Gardening Journal

Name: _____ School: _____

Date: _____ Week: _____

Garden Observations

a. What did you plant this week? (If you didn't plant anything new, what plants did you tend to?)

b. Draw a picture of your garden or a plant you worked with today in the space below:

[Drawing Space]

c. Describe any changes you have noticed in your garden or plants since last week (e.g., new leaves, growth in height, insects, etc.):

Garden Activities

a. What tasks did you perform in the garden today? (e.g., watering, weeding, planting, etc.)

b. What tools and materials did you use for these tasks?

c. Draw a picture of one activity you did or a tool you used in the garden today:

[Drawing Space]

Reflections

a. What was your favorite part of today's gardening activities? Why?

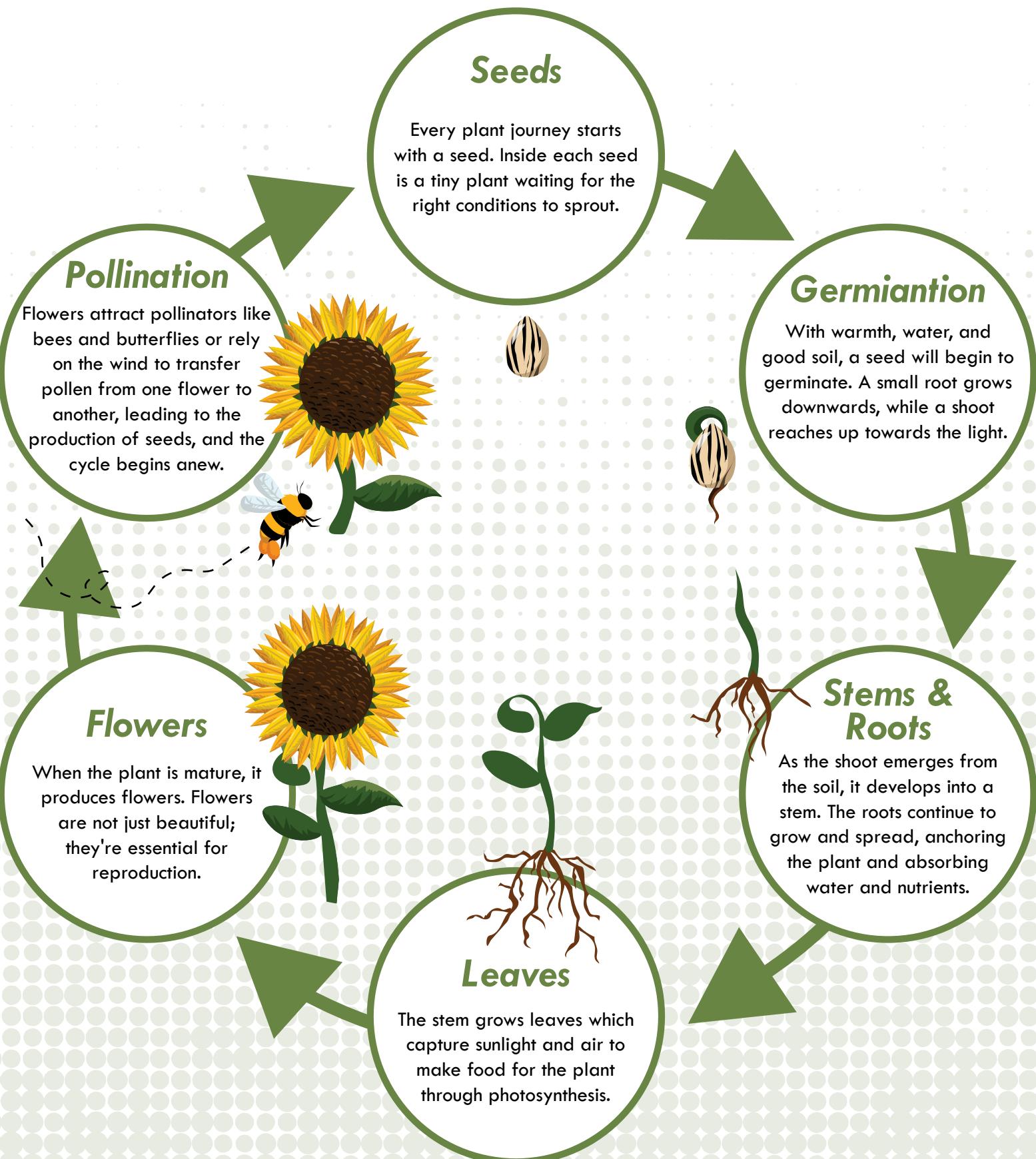
b. Was there anything that you found challenging or unexpected? Explain.

c. What are you looking forward to doing in the garden next week?

Teacher's Notes: (For teacher's use only)

Informational Handouts

The Plant Life Cycle: A Quick Guide for Young Gardeners



Essential Guide to Key Plant Families in Gardening

Solanaceae: The Nightshade Family

- Includes: Tomato, Eggplant, Bell Pepper, Chili Pepper, Tobacco, Potato
- Characteristics: Alternate, often pubescent leaves; flowers with pointed anthers; fruits typically berries. Prone to pests like tobacco mosaic virus and fungi.
- Growing Tips: Prefers rich, moist soil with good organic content.



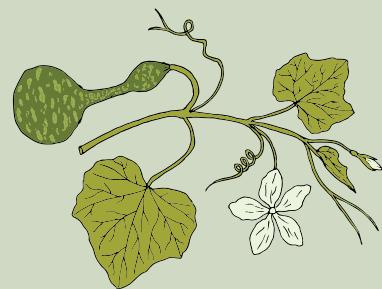
Fabaceae: The Legume Family

- Includes: Peas, Beans, Peanuts
- Characteristics: Compound leaves, legume fruit. Notable for nitrogen-fixing Rhizobium bacteria on roots.
- Growing Tips: Thrives with minimal nitrogen fertilizer; benefits from well-rotted compost. Sensitive to transplanting.



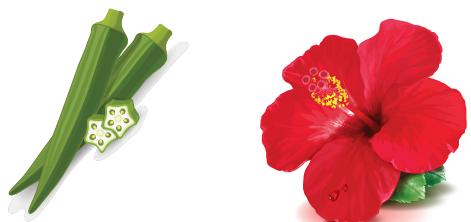
Cucurbitaceae: The Gourd Family

- Includes: Cucumbers, Melons, Squashes
- Characteristics: Annual climbers with tendrils, large lobed leaves, and usually monoecious.
- Growing Tips: Requires constant moisture (not wet), rich compost, and does well on trellises. Watch for mildews and beetles.



Malvaceae: The Hibiscus Family

- Includes: Okra, Cotton, Hibiscus
- Characteristics: Palmately lobed leaves, large flowers, and capsule fruits.
- Growing Tips: Loves sun and heat, drought-tolerant, watch for flea beetles.



Alliaceae: The Onion Family

- Includes: Onions, Garlic, Leeks
- Characteristics: Monocots with bulbous growth, long thin leaves.
- Growing Tips: Prefers cool to warm weather transitions, well-drained loamy soil, and regular watering.



Poaceae: The Grass Family

- Includes: Corn, Wheat, Rice
- Characteristics: Strap-shaped leaves, fibrous roots. Important for grains.
- Growing Tips: Requires significant nitrogen, benefits from organic matter, plant in blocks for pollination.



Asteraceae: The Sunflower Family

- Includes: Lettuce, Artichokes, Sunflowers
- Characteristics: Composite flowers, alternate leaves. Attracts pollinators.
- Growing Tips: Fast-growing, needs organic matter in soil, not suitable for heavy clay.



Brassicaceae: The Mustard Family

- Includes: Broccoli, Cabbage, Kale
- Characteristics: Waxy or hairy leaves, crucifer flowers.
- Growing Tips: Prefers cooler seasons, shallow-rooted, add organic matter for pH balance, watch for cabbage moths.



Chenopodiaceae: The Goosefoot Family

- Includes: Beets, Spinach, Chard
- Characteristics: Large simple leaves, tiny green flowers.
- Growing Tips: Deep-rooted, requires well-drained soil and deep watering, not suited to acidic conditions.



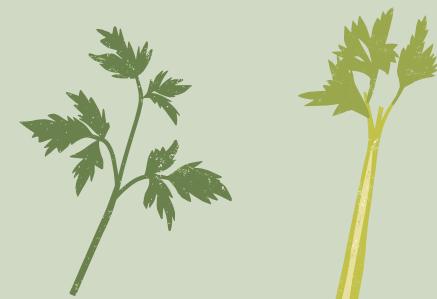
Amaranthaceae: The Amaranth Family

- Includes: Amaranth, Quinoa
- Characteristics: Simple leaves, often with pubescent flowers.
- Growing Tips: Hardy, drought-tolerant, enjoys sun, and benefits from manure.



Apiaceae: The Parsley Family

- Includes: Carrots, Parsley, Celery
- Characteristics: Cooler-season crops with a need for water.
- Growing Tips: Prefers sandy or loamy soil, avoid fresh manure, protect from carrot flies.



Lamiaceae: The Mint Family

- Includes: Mint, Basil, Rosemary
- Characteristics: Aromatic herbs, often perennial with square stems.
- Growing Tips: Drought-tolerant, can thrive in poor soils, invasive growth habit.



Easy Gardening: Insect Control Guide

Gardening success often hinges on managing insect pests, which can damage plants by chewing on leaves, stems, roots, or fruit, or by sucking out plant juices. Recognizing and controlling these pests is crucial for a healthy garden.

Common Garden Pests:

Sucking Insects:

Aphids, stink bugs, leafhoppers, squash bugs, and whiteflies target the juices from leaves, stems, and fruits.



[squash bug]



[aphids]

Chewing Insects

Grasshoppers, potato beetles, flea beetles, cucumber beetles, armyworms, cutworms, cabbage loopers, and corn earworms damage plants by eating leaves or cutting off plants at ground level.



[cabbage looper]



[grasshopper]

Identifying Insect Problems

- Look for stunted growth, deformed or damaged leaves, yellowing, or wilting.
- Inspect plants and soil closely for insects or egg masses.

Insect Control Strategies:

Natural Prevention Strategies:

- Maintain a weed-free garden, mow surrounding areas.
- Choose locally adapted plant varieties.
- Apply appropriate fertilizers and water.
- Remove or plow under old plants after harvest.
- Wash off pests like aphids with water.
- Hand-pick insects or egg masses from plants.



Chemical Control:

- May be necessary for severe infestations.
- Use dusts or sprays, applying before pests multiply.
- Read and follow pesticide labels carefully.
- Keep pesticides away from children and pets.



Recommended Insecticides:

Conventional:	Endosulfan	Kelthane	Sulfur	
	Malathion	Disulfoton	Sevin	Naled
Organic:	Pyrethrin	Azadirachtin	Garlic juice extract	
	Spinosad	Neem oil	Bacillus thuringiensis (Bt)	

Note: Always prioritize safety and environmental health when considering chemical controls, and opt for cultural methods when possible to maintain a balanced ecosystem in your garden.

Nature's Helpers: Beneficial Insects in Your Garden

Embrace the natural guardians of your garden! Discover the allies hidden among the leaves and learn how to welcome these beneficial insects.

Lady Beetles: The Aphid Eaters

- Appearance: Small, oval, and brightly colored, often found near aphid colonies.
- Role: Devour aphids, scale insects, and mealybugs, keeping plant pests in check.



Ground Beetles: The Nighttime Hunters

- Appearance: Flattened, dark, and shiny, hiding under debris by day.
- Role: Feed on other insects, slugs, and snails, providing natural pest control.



Fireflies: The Glowing Guardians

- Appearance: Known for their enchanting evening light shows.
- Role: Larvae feed on smaller insects, slugs, and snails, reducing garden pests.



Praying Mantids: The Ambush Predators

- Appearance: Recognizable by their upraised front legs, ready to strike.
- Role: Prey on various insects, though they might also target other beneficial species.



Lacewings: The Voracious Feeders

- Appearance: Delicate wings and sometimes golden eyes, with fierce larvae.
- Role: Larvae hunt aphids, mites, and other pests, consuming over 100 daily.





Dragonflies: The Aerial Acrobats

- Appearance: Large eyes and spiny legs, often found near water.
- Role: Adults and nymphs feed on mosquitoes, gnats, and even small fish, aiding in pest control.



Hover Flies: The Disguised Allies

- Appearance: Mimic wasps and bees but are harmless and often found around flowers.
- Role: Larvae feed on aphids and other pests, contributing to garden health.



Antlions: The Crafty Trappers

- Appearance: Larvae with sickle-shaped mouthparts, dwelling in sandy soils.
- Role: Create pits to trap ants and other insects, reducing garden pests.



Parasitoid Wasps: The Silent Assassins

- Appearance: Various species, some seen with larvae on caterpillars.
- Role: Larvae feed inside host insects, emerging to control pest populations effectively.

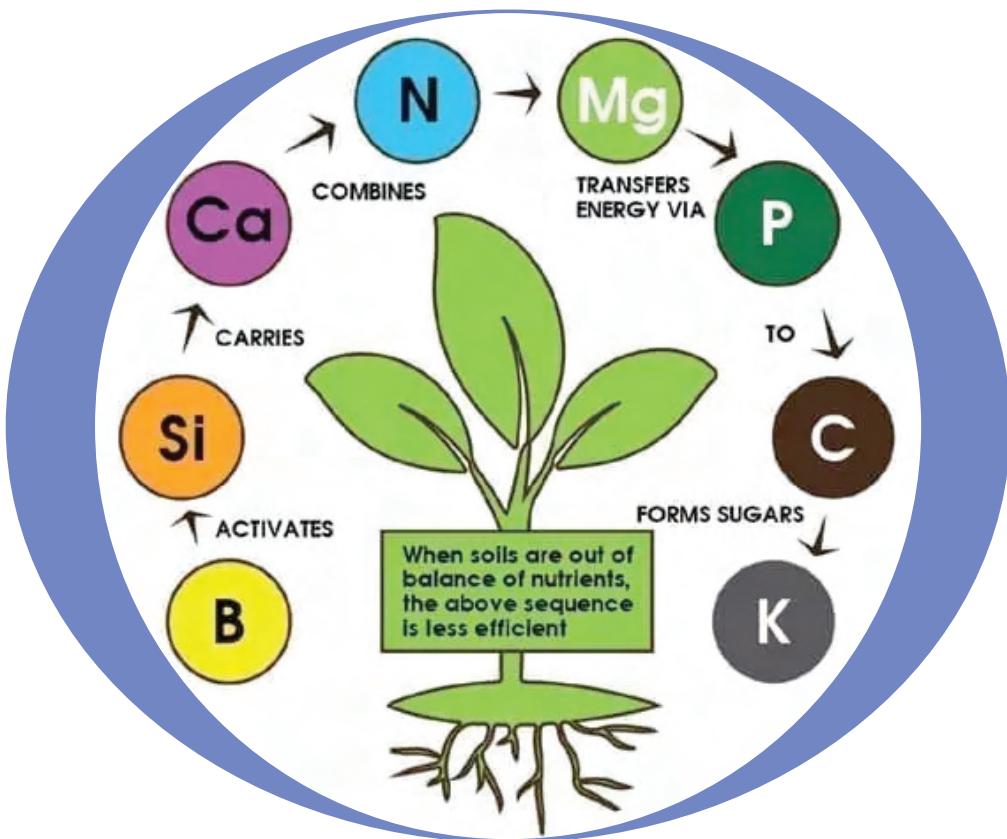
Encouraging Beneficial Insects:

- Maintain diverse plant species to provide habitats and food sources.
- Avoid broad-spectrum pesticides that harm beneficial insects.
- Provide water sources and shelter to support their life cycles.

Foster a Thriving Ecosystem: By understanding and supporting these beneficial insects, you can naturally maintain a healthy and productive garden.

Essential Nutrients for Plant Health

Plants, like all living organisms, need a variety of nutrients to thrive. These nutrients, absorbed from soil and water, are crucial for growth, health, and productivity. Here's a simplified guide to the 19 key nutrients vital for plant well-being:



Primary Nutrients:

- **Nitrogen (N):** Builds proteins and chlorophyll, essential for growth and energy conversion.
- **Phosphorus (P):** Crucial for energy transfer, root development, and flowering.
- **Potassium (K):** Aids in water retention, enzyme activation, and disease resistance.

Secondary Nutrients:

- **Calcium (Ca):** Stabilizes cell walls and aids in disease resistance.
- **Magnesium (Mg):** Central to chlorophyll production and stress reduction.
- **Sulfur (S):** Vital for amino acids, proteins, and overall plant vigor.

Micronutrients:

- **Iron (Fe):** Needed for chlorophyll synthesis and enzyme functions.
- **Manganese (Mn):** Supports photosynthesis and stress tolerance.
- **Boron (B):** Essential for cell growth and reproductive development.
- **Copper (Cu):** Influences nitrogen metabolism and seed production.
- **Zinc (Zn):** Involved in chlorophyll formation and plant immunity.
- **Molybdenum (Mo):** Facilitates nitrogen usage and fixation.
- **Chlorine (Cl):** Important for photosynthesis and osmotic balance.
- **Nickel (Ni):** Affects seed germination and stress responses.

Beneficial Nutrients:

- **Silicon (Si):** Enhances strength, stress tolerance, and productivity.
- **Cobalt (Co):** Aids in nitrogen fixation and stress reduction.
- **Sodium (Na):** Substitutes potassium in certain functions and aids in photosynthesis.
- **Selenium (Se):** Improves stress tolerance and overall growth.
- **Iodine (I):** Supports enzyme functions and developmental processes.



Enhancing Plant Nutrition:

- Use organic and mineral fertilizers to supplement soil nutrients.
- Tailor nutrient application to specific plant needs for optimal health and yield.

Empower Your Plants: Understanding and providing these essential nutrients will ensure a vibrant and productive garden.

Healthy Eating with Colors

Why Brighten Your Plate?

Adding a splash of color to your meals isn't just pleasing to the eye; it's a boost to your health! Here's why a colorful diet matters:

1. Nutrient Powerhouses

- What's In: A rainbow of fruits and veggies packs essential vitamins and minerals.
- Tip: Incorporate a variety of colors in every meal for maximum benefits.

2. Naturally Wholesome

- What's Out: Unwanted trans fats, saturated fats, and sodium.
- Action: Fill half your plate with fruits and vegetables for a clean, nutrient-rich diet.

3. Light and Satisfying

- Benefits: Low in calories but high in fiber and water, making you feel full without extra weight.
- Suggestion: Opt for fruits and veggies as snacks to keep hunger at bay healthily.

4. Versatile Choices

- Options: Fresh, frozen, canned, or dried - all forms count.
- Smart Pick: Select options low in added salts and sugars for the healthiest choices.

5. Comprehensive Wellness

- Impact: Regular consumption can reduce the risk of chronic diseases and support overall health.
- Goal: Aim for a diverse intake to benefit heart health, weight management, and more.

Remember: Eat Smart, Move More, Be Well!

Embrace the power of nature's palette to enhance your health and well-being!



Colorful Choices for Healthy Living

Dive into a Spectrum of Health Benefits with Every Color:

Orange: The Shield of Wellness

- Key Benefits: Boosts heart health, strengthens immunity, shields skin, and fights free radicals.
- Eat More: Carrots, oranges, pumpkins.

Yellow: The Glow of Vitality

- Key Benefits: Supports heart health, reduces cholesterol, maintains healthy joints and eyesight, and nurtures skin.
- Eat More: Bananas, yellow peppers, pineapples.

Red: The Heart's Ally

- Key Benefits: Enhances heart health, lowers blood pressure, protects skin, wards off cancer, and promotes cell renewal.
- Eat More: Tomatoes, strawberries, red apples.

Purple: The Essence of Longevity

- Key Benefits: Promotes heart and vessel health, boosts memory, has anti-aging effects, and supports the urinary system.
- Eat More: Eggplants, blueberries, plums.

Green: Nature's Detox

- Key Benefits: Cancer prevention, bone strengthening, immune support, eyesight improvement, and digestion aid.
- Eat More: Spinach, broccoli, kiwis.

White: The Guardian of Immunity

- Key Benefits: Bolsters the immune system, ensures colon health, supports heart health, prevents ulcers, and lowers cholesterol.
- Eat More: Garlic, onions, mushrooms.



IMMUNE SUPPORT



BEAUTY



CANCER PREVENTION



HEART HEALTH



LONGEVITY



DETOXIFICATION



Immune system



Healthy heart



Healthy heart



Healthy heart



Healthy heart



Improves digestion



Healthy colon



Lowers cholesterol



Immune system



Decr. blood pressure



Healthy blood vessels



Supports eyesight



Prevents ulcers



Healthy joints/tissues



Skin protection



Skin protection



Helps memory



Healthy bones



Lowers cholesterol



Supports eyesight



Supports eyesight



Helps cell renewal



Anti-aging



Immune system



Healthy heart



Healthy skin



Antioxidant



Prevents Cancer



Healthy urinary system



Prevents Cancer

Embrace the Colors of Health: Eat a Rainbow Every Day!

Incorporating a variety of colorful fruits and vegetables into your diet can lead to a healthier, happier life.

Quick Guide to Storing and Cleaning Fresh Vegetables



Ensure the longevity and safety of your fresh produce with these simple steps:

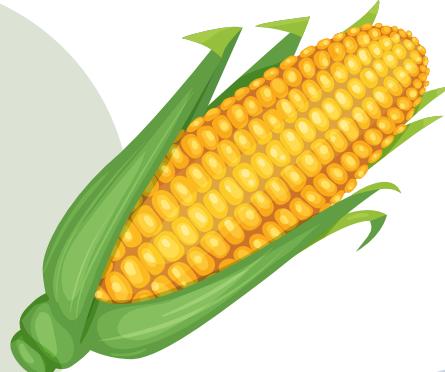
General Tips:

- Refrigerate cut or peeled vegetables immediately.
- Use a produce brush for thorough cleaning where recommended.
- Store leftovers properly to maintain freshness.

Vegetable Care:

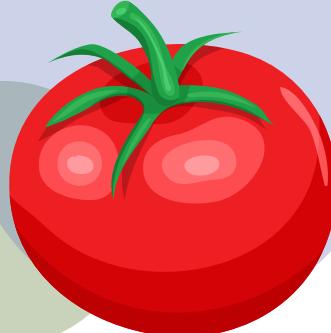
Broccoli, Corn, Green Beans, Lettuce, & Spinach

- Storage: Keep refrigerated.
- Cleaning: Rub under water; for lettuce and spinach, remove outer leaves.



Avocado & Tomatoes

- Storage: Refrigerate after ripening.
- Cleaning: Scrub gently.



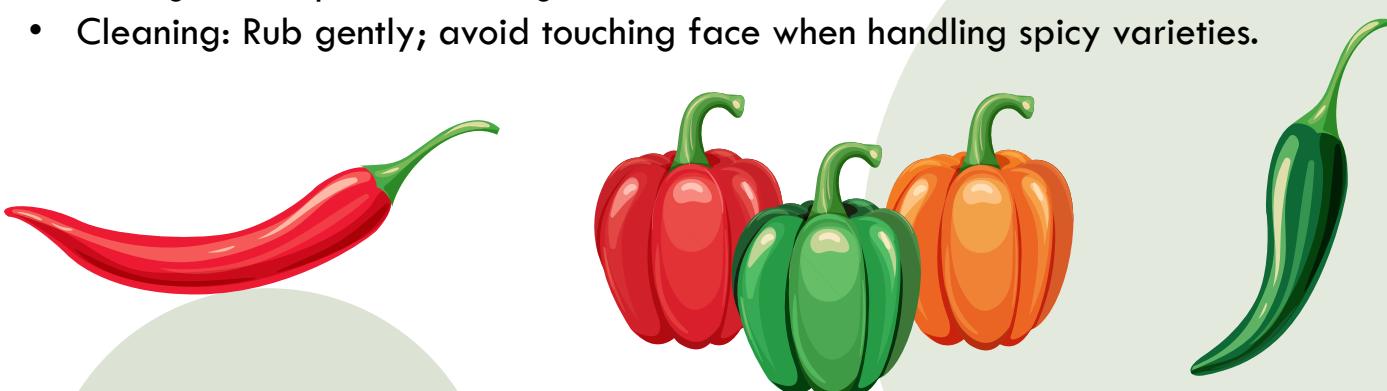
Carrots, Cucumbers, Garlic, Onions, Potatoes, Radishes, & Zucchini

- Storage: Cool place or refrigerate; avoid refrigeration for garlic and potatoes.
- Cleaning: Scrub well; for cucumbers, rinse before peeling.



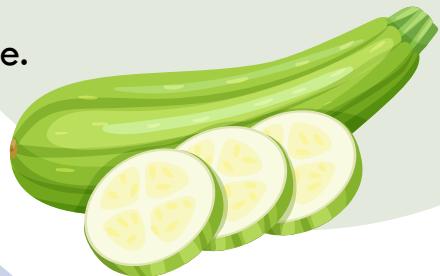
Chilies & Other Peppers

- Storage: Cool place or refrigerate.
- Cleaning: Rub gently; avoid touching face when handling spicy varieties.



Squash (Including Zucchini)

- Storage: Room temperature until ripening, then refrigerate.
- Cleaning: Scrub; rinse before peeling.



Special Considerations:

- Bagged greens labeled "pre-washed" don't require additional washing.
- Store onions in a well-ventilated area; avoid freezing whole onions.
- Remove imperfections from radishes and other root vegetables as needed.

Keep Your Vegetables Fresh and Safe: Adopt these practices to enjoy the full nutritional benefits of your garden's bounty.