



Plants Need a Place to Grow – Containers

Goal: Learn where plants grow and how their care is affected by the environment

Master Gardeners

The University of California Cooperative Extension (UCCE) Master Gardener Program (MGP) is an educational program designed to teach and effectively extend information to address home gardening and non-commercial horticulture needs in California.

UCCE is the outreach arm of UC's division of Agriculture and Natural Resources (ANR). Master Gardener volunteers (MG volunteers) promote the application of basic environmentally appropriate horticultural practices through UCCE-organized educational programs that transfer research-based knowledge and information.



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What are Places Plants Grow?

- Think about what plants need:
 - Light/Sun
 - Air
 - Nutrition
 - Water
 - Soil
- Where can plants grow and have what they need?



Where Plants Grow – Let's Review

- In a container or pot
- In a raised bed
- In a greenhouse
- In a garden or field
- In a hydroponic tower in water
- Other?
- In this lesson we will discuss growing vegetables in containers to better understand the requirements to care for plants in pots.



Container Gardens



- Containers can be made of different materials:
 - Clay
 - Wood
 - Plastic
 - Biodegradable material
 - Ceramic
 - Other
- Containers need a drainage hole in the bottom for excess water

Advantages of Planting Vegetables in Containers

- Flexible planting site
 - Can grow in smaller spaces
- Ability to move plants to sunny or shady areas – plants need light/sun but not too much!
- Can control soil conditions
- Can select a pot deep enough for plant roots
- Pots that are not porous retain water



Water Retention in Containers

- Clay or terra cotta pots are porous and provide more air; but need frequent watering
- Cedar and redwood planters are resistant to decay and insulate
- Metal planters can get hot; need more watering
- Biodegradable containers are porous, but can be placed directly into the ground
- Ceramic or glazed pots retain water better than clay



What Should you Plant?

- Shallow-rooted crops, like lettuce, green onions, radishes and spinach are easy to grow
- Carrots, potatoes, turnips and other root crops need deeper containers
- Tall or spreading vegetables, like peppers, squash and tomatoes, have extensive roots and need larger containers
- Stakes and trellis for tomatoes and vine vegetables should be placed in the pot when planting



Planting Vegetables in Pots

- Be sure the pot is large enough for the vegetable plant when it is mature, and deep enough for the roots
 - up to 24" for deep rooted vegetables
- Choose a good quality potting mix or potting soil with pumice
- If the soil does not include fertilizer you may add a light dose at planting



Transplanting Vegetables in Pots

- Dig a hole the size of the small pot containing the vegetable start (See picture)
- Gently remove the small plant from its container.
 - If it is rootbound, spread the roots and plant it in the hole at the same level as the soil in the pot





Vegetables Transplanted Into Larger Pots

- The bottom picture shows broccoli right after it was transplanted.
- The top left picture is cauliflower when it is mature, and is ready to harvest.
- The pot at the top right has two varieties of lettuce.



Helping the Vegetables Grow

- For most vegetables, make sure the pot has 6 to 8 hours of sun during the day
- Move the pot to a cooler, protected area on very hot or windy days
- Give the plant enough water
 - Put a finger in the soil, if it is dry one inch below the surface, water
 - Watering will vary with the seasons
 - Place a saucer under the pot to capture the excess water





Nutrients

- Plants need food and nutrients to survive, just like people
- Plants in containers cannot search for nutrients in the soil in the ground
 - Watering removes some nutrients from the soil
- Two to four weeks after planting, use a fertilizer dissolved in water at 1/4 strength (fish emulsion, kelp) with each watering

Video

Video: [Growing Vegetables in Containers](#)

Note that the speaker is working in a greenhouse while planting vegetables

Review

- Name 3 places that plants can grow.
- What are the advantages of growing vegetables in containers?
- What types of pots retain water better?
- Why do plants in pots need good drainage?
- Why do you need to fertilize vegetables in containers regularly?
- Describe how you would fertilize vegetables in containers.
- Write your answers on a paper.



Definitions

- **Biodegradable** - capable of being decomposed or broken up by bacteria or other living organisms.
- **Fish emulsion** - a liquid organic fertilizer made with fish or fish parts.
- **Hydroponics** - the process of growing plants in sand, gravel, or liquid, with added nutrients but without soil.
- **Porous** - having minute spaces or holes through which liquid or air may pass.
- **Rootbound** - the roots of a plant have completely taken up space within the pot that contains it.

Application #1

- Think of three items you have that could be recycled and used as plant containers. List them on paper.
- If you are going to use a recycled container, it may need drainage. Be sure to ask an adult to help you put a drainage hole in any pot.





Application #2

- **Do you have plants growing in containers where you live?**
- Ask an adult if you may take over watering of one or two of the container plants. Remember:
 - Put your finger in the soil to 1 inch; if the soil is dry, water the plant
 - Make sure the water reaches the tip of the roots
 - Have a dish under the pot to catch runoff



Extension #1

- The container in the picture is a terrarium, an enclosed growing container. A terrarium:
 - Doesn't have a drainage hole
 - Is enclosed, except for an opening on the top
- How would you make sure you can manage water, so the soil is not too moist or too dry?
- How does the enclosed space help to manage the moisture level?
- Video: [How to Build a Pop Bottle Terrarium](#)

Extension #2

Growing Vegetables in a Bag

- Another way to grow vegetables is to plant them directly into the potting soil bag! Some vegetable potting soil even has the fertilizer in the soil
- How to:
 - With an adult, cut a square hole or slit in the bag; put drainage holes in the bottom
 - Plant vegetables, keeping in mind the space requirements
 - Care for the plants as described in the lesson



Next Generation Science Standards

- 3rd Grade
- LS1.B: Growth and Development of Organisms. Reproduction is essential to the continued existence of every kind of organism. Plants and animals have unique and diverse life cycles. (3-LS1-1)
- LS2.C: Ecosystem Dynamics, Functioning, and Resilience. When the environment changes in ways that affect a place's physical characteristics, temperature, or availability of resources, some organisms survive and reproduce, others move to new locations, yet others move into the transformed environment, and some die. (secondary to 3-LS4-4)
- LS4.D: Biodiversity and Humans ☐ Populations live in a variety of habitats, and change in those habitats affects the organisms living there. (3-LS4-4)

Next Generation Science Standards - Continued

- 4th Grade
- LS1.A: Structure and Function. Plants and animals have both internal and external structures that serve various functions in growth, survival, behavior, and reproduction. (4-LS1-1) L
- 5th Grade
- LS1.C: Organization for Matter and Energy Flow in Organisms. Plants acquire their material for growth chiefly from air and water. (5-LS1-1)
- LS2.B: Cycles of Matter and Energy Transfer in Ecosystems ☐ Matter cycles between the air and soil and among plants, animals, and microbes as these organisms live and die.
- LS2.A: Interdependent Relationships in Ecosystems. The food of almost any kind of animal can be traced back to plants.

Resources

- Grow L.A. Victory Garden Initiative, Vegetable Garden Handbook for Beginners, <http://celosangeles.ucdavis.edu/files/97094.pdf>
- UC Master Gardeners, Santa Clara County, CA, Container Gardening Basics, <http://mgsantaclara.ucanr.edu/garden-help/container-gardening/>
- Images: www.kiddle.com, www.easyscienceforkids.com, www.bbc.co.uk, www.kids.kiddle.co
- Video: K State Research and Extension, <https://www.youtube.com/watch?v=jBGkqT769KM&t=7s>
- Video: Memorial University of Newfoundland, https://www.youtube.com/watch?v=69hYV9ti_R8
- Oxford Language Dictionary

Gardening Questions?

- Email or Call the UCCE Master Gardeners of Riverside County
- Email Helpline
 - anrmgriverside@ucanr.edu
- [Riverside Master Gardeners Website](#)



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