LiveWell Kids
Garden and Nutrition Program

Lesson 6: Planting Warm-Season Crops & Creating Balanced Meals

OBJECTIVES

By the end of this lesson, students will:

- Learn about warm-season crops and seasonal planting.
- Understand how to prepare soil for planting.
- Learn and experience proper seed planting procedures.
- Recognize that gardening is a form of moderate exercise and contributes to daily physical activity.
- Learn the importance of eating balanced meals and how to accomplish this.
- Understand "serving size" and "servings per container" and where to find this information on the Nutrition Facts label.

SUPPLIES

Supplies to bring from classroom to garden - *arrange with teacher ahead of time:*

- Paper - one piece per student
- Writing tools - such as crayons, colored pencils, or markers

Supplies to bring from the shed to the garden:

- Nutrition laminate:
  - *Nutrition Facts: Serving Size*
- Garden laminates:
  - Your 2 grade-level seed packet laminates
- LiveWell Kids Laminate:
  - *2022- Lesson Review Game*
- A planting bag, labeled by grade, containing:
  - 2 seed packets
  - Plant labels
- 2 Sharpies
- Cultivators (the number will vary per class)
- Rake
- Compost bucket and scooper (unless your bed has a bag of soil leaning on it)
- Watering cans
- Ruler
- Kneelers
- 2 Popsicle sticks
- Wheelbarrow or your largest container
- If needed: Yarn, scissors & 2 Popsicle sticks
- Optional: Gloves

PREPARATION

- Refer to the "Background and Preparation" document for details about preparing for this lesson one week prior and the day of. The document can be found at https://www.bchd.org/LiveWellKids and inside the shed door.
- Allow **30 minutes** for set-up and preparation on the day of the lesson.

SET-UP INSTRUCTIONS

The ***Planting Guide*** is posted on the inside of the shed door. You will refer to it during the planting section.

- Fill the watering cans (half full for younger students.)
- If you DON'T have a bag of soil, use the compost scooper to scoop compost from the compost bin into the bucket. You will see a sign in the compost bin telling you which line to fill to, either line "A" or line "B". The line is labeled on the inside of the bucket.
- Set the following items near the garden bed to be used while soil prepping:
    - Cultivators
    - Rake
    - Compost bucket with compost (if no soil bag)
    - A wheelbarrow or your largest container
    - Kneelers
    - Optional: gloves (not all students are comfortable with gloves.)
- If needed, you will make a "row-planting guide tool" by cutting a piece of yarn longer than the length of your bed and tie each end to a popsicle stick. The tool will end up being the length of your bed. ****Check to see if someone has already made one.**
    - If the beds are the same size, everyone can use the same one. If there isn't one, make one and leave it with the lesson supplies for others to use**.**
- Set the following supplies near (but not right next to) the garden bed to be used while planting:
    - Ruler
    - 2 Popsicle sticks
    - Yarn/popsicle sticks row-planting guide tool
    - Bag of seeds and labels
    - 2 Sharpies
    - 2 Seed packet laminates
    - *Nutrition Facts* laminate
    - Watering cans with water
- Remove the irrigation lines from the garden bed (following the instructional video on the website under "Lesson 2") and place them away from where the kids will be working.

INTRODUCTION & MINDFUL BREATHING

(ALL GRADES: 1 MINUTE)

- Greet the class and introduce any new volunteers.
- Guide students through a mindful breathing exercise.
- Explain the purpose of this lesson is to:
  - Explore the garden.
  - Plant warm-season crops.
  - Discuss balanced meals and serving size.

Divide Class into Two Groups

Split the students into two groups. Keep one group at the garden bed where the students will prepare the soil for planting. Send the other group with your co-volunteer to the nutrition activity. Both activities will run simultaneously. After completing the nutrition lesson and this first part of the garden activity, both groups will come back together and finish the garden lesson by planting, labeling and watering the seeds.

NUTRITION: BALANCED MEALS

(GRADES K-2: 9 MINUTES, GRADES 3-5: 13 MINUTES)

The nutrition section has four parts, including an activity:

1. Balanced Diet
2. Nutrition Facts Label: Serving Size and Servings per Container
3. Sometimes Foods
4. Activity: Guess My Plant-Part Breakfast

Grades	Balanced Diet[1]
K - 5th	• Our body needs nutrients from all five food groups to be healthy and function properly. • Eating healthy options from all five food groups provides nutrients the body needs in the right amount, including vitamins, minerals, protein, carbohydrates and fats. • This is a balanced diet. • Sometimes when we try to eat balanced meals, we get stuck eating the same foods each time. • For example, we may eat apples for our fruit, whole-grain bread for our grain and carrots for our vegetable. • While these foods are healthy, adding variety to our meals is a great way to develop healthy eating habits and expand the nutrients we get each day.

	○ Remind students about lesson 5 when they learned about the value of eating a variety of colorful fruits and vegetables. • Plus, it can be fun to try different foods and you may discover something new you like eating.

Grades	**Serving Size & Servings Per Container**[2] Laminate – *Nutrition Facts: Serving Size*
K - 5th	• Whereas MyPlate is one way to think about the amount of food to eat during a meal, serving size is another. • The Nutrition Facts label includes **serving size**. Serving size tells you the amount of food in 1 serving. • **Servings per container** is the total number of servings in the entire package. ○ Volunteers: Point out on the laminate, *Nutrition Facts: Serving Size*, where to find "serving size" and "servings per container." ○ Note that servings are based on what an adult, not a child, typically eats at one time. Depending on the child's size, age and activity level, the appropriate serving size might be less. • Since the food label shows what is in one serving, if you eat more than the serving size, then you might be eating more than the daily recommended savings of sugar or salt – which isn't good for your health. • For example: ○ If there are 16 servings in a bag of pretzels and each serving is 17 pretzels, then you have 272 pretzels in the bag. ○ This is enough pretzels for an entire soccer team! (Consider using simpler examples for younger kids.) ○ Math is helpful with food labels!

Grades	**Sometimes Foods**[3]
4th - 5th	• As you get older, you can start making decisions about your clothing, activities and music. You also may be ready to make decisions that affect your health, such as deciding what to eat and drink. • Your body is growing and it needs nutritious foods for your overall health. ○ Not getting enough healthy nutrients can affect your mood, energy level, school and athletic performance and much more. • There are times when it's easy to eat healthy foods and other times it can be a challenge, especially if you're at a celebration, watching sports or hanging out with your friends. • As you learned in previous lessons, sweets, packaged snack foods and fast foods typically have fewer nutrients and may have added sugars and contain more fat and salt.[13] • Even though these "sometimes foods" can be enjoyed in moderation, it's best for everyone, especially kids who are growing, to eat mostly whole, nutrient-dense foods so your body gets what it needs for growth, development and overall health.

Grades	Activity: Guess My Plant-Part Breakfast[4]

K - 5th	• Begin by informing students about the different parts of a plant that people eat: roots, stems, leaves, flowers, fruits and seeds.
	• Tell the class that you had a delicious breakfast of plant parts.
	• Name the plant parts and ask the students to figure out what you ate for breakfast.
	• For example:
	  ○ You ate a bowl of oval, flat seeds and dried, brown wrinkled fruit with scented, crushed bark sprinkled on top.
	  ▪ Answer: a bowl of oatmeal with raisins and cinnamon
	  ○ You drank a cup of dried leaves soaked in water and a slice of yellow fruit.
	  ▪ Answer: a cup of tea with a slice of lemon
	• Depending on time, you can ask students to get in pairs or groups and have them do this activity amongst themselves, where they come up with creative, plant-part food combinations.

Switch groups after 9 - 13 minutes

GARDEN PART 1: PLANTING WARM-SEASON CROPS

(GRADES K-2: 9 MINUTES, GRADES 3-5: 13 MINUTES)

The first part of the garden section has two steps (happening at the same time as the nutrition activity):

1. Discussion: What you're planting and soil preparation.
2. Activity: Prepare the soil for planting: remove old plants before amending and cultivating the soil.

Grades	What You're Planting
K – 5th	• Each grade will plant two different warm-season crops. • Warm-season plants like warmer air and soil, more intense sunlight and longer hours of light compared to cool-season plants.[5] ○ If we were to plant warm-season crops in the winter, they wouldn't grow as well as they do in the warmer months.
K – 1st	**Zucchini and Beans** • Zucchini is a type of squash related to pumpkins and cucumbers.[6] • Zucchini can grow either on a vine or a bush, depending on the type.[7] • Beans are a legume, like peas and lentils.[8] • Beans can grow either on a vine or a bush, depending on the type.[9]

2nd – 3rd	**Tomatoes and Basil** • Tomatoes are related to peppers, tomatillos and eggplants.[10] • Tomatoes can grow either on a vine or a bush, depending on the type you're planting.[11] • Basil comes in a variety of flavors, such as lemon, lime and cinnamon.[12] • Basil is in the mint/sage family and is highly aromatic.[13]
4th – 5th	**Pumpkins and Sunflowers – <u>THIS IS A SECRET, DON'T TELL THE OTHER GRADES!</u>** • Pumpkins can grow either on a vine or a bush, depending on the type.[14] • Sunflowers come in many varieties which vary in height, color, size and number of flowers on a stalk.[15] • Some varieties of sunflowers have seeds that are good for eating while others grow seeds that are used to make sunflower oil.[16]

Grades	**Discussion: Soil Prepping**
K – 5th	• Direct the students to stand on the opposite side of the garden bed from you. • Explain that they will all be planting in the garden bed. • If sharing the bed with other classes, then show the students where your class will be planting.
K – 2nd	• The Garden Angels already removed the cool-season plants and amended the soil. • Both groups of students will cultivate the soil. • Ask if anyone can remember what cultivate means. ○ *To cultivate (fluff up) the soil **aerates** it, which means creating air spaces throughout the soil.*[17]

3rd – 5th	• Ask if anyone can remember what amend means.
	  ○ *To amend soil is to add and mix in nutrients, usually in the form of compost, to the soil that is already there.*[18]
	• Ask if anyone can remember why we amend soil.
	  ○ *We amend soil because the previous plants that grew in the same place already took the nutrients, leaving the soil depleted (without enough nutrients) for the new plants.*[19]
	• The first group of students will remove the old plants and cultivate while the second group will amend the bed with compost (or amended soil from a bag) and use the cultivators to incorporate it throughout.
	• Ask if anyone can remember what it means to cultivate.
	  ○ *Cultivating (fluffing up) the soil **aerates** it, which means creating air spaces throughout the soil.*[20]
	• Ask if anyone can remember why we cultivate soil.
	  ○ *There are several benefits to cultivating/aerating soil, including:*[21]
	  ▪ *Cultivating soil breaks up soil that has become hard and compacted over time.*
	  ▪ *Decomposers living in the soil need air spaces so that they can breathe and move around.*

	▪ *Fragile seedlings need soil to be light and fluffy for pushing their hair-like roots through.* ▪ *Water needs soil to be soft and loose so that it can soak in and reach the deeper layers.*

Grades	**Activity: Preparing the Soil for Planting**
K – 5th	• While soil prepping and planting, educate the students about the importance of each task. Assist students with jobs as needed.
K – 2nd	<u>Both</u> groups of students will cultivate the soil. • Pass out the cultivators, kneelers (and optional gloves) to half the students in your group and instruct the others to wait. • Instruct them to spread out on the kneelers around the bed and cultivate as deeply as they can. • After 3-4 minutes, have them leave their cultivators in the soil and change places with the remaining students. • Allow them to cultivate until it's time to switch groups. • After the second group cultivates, gently rake the soil surface until it is level, keeping it light and fluffy.
3rd – 5th	The two groups will each do a different soil-prepping activity in the garden bed. • <u>The 1st group</u> will remove old plants. o Allow students to take turns removing the plants in the bed. o Instruct them to GENTLY shake or brush off the soil from the roots of each plant so that it falls back into the garden bed. o Place the removed plants in the wheelbarrow or large container. o Switch groups. • <u>The 2nd group</u> will cultivate the soil. o Pass out the cultivators, kneelers (and optional gloves) to the students. o Instruct the students to spread out around the bed and cultivate as deeply as they can. o Allow the students to work for 3-4 minutes before adding either amended bagged soil or compost: ***<u>**If you have a bag of amended soil resting against your bed**</u>**, *<u>this means that your soil level is low. Have the students cultivate the soil for 3 minutes before tearing the bag open and spreading the contents over the soil. Resume cultivating to thoroughly mix the new soil with the existing soil.</u>* o Resume cultivating to incorporate amendment. o Gently rake the soil surface until it is level.

**<u>Bring the entire class back together at the garden bed.</u> **

GARDEN PART 2: PLANT & LABEL THE SEEDS – WITH THE WHOLE CLASS

(GRADES K-2: 10 MINUTES, GRADES 3-5: 18 MINUTES)

The second part of the garden section has two steps:

1. Plant and label the seeds.
2. Water the newly planted seeds (for grades 3-5 only.)

Note: Refer to the Planting Guide inside the shed door to show you where to plant within the beds.

Grades	**Create Rows for Planting**
K – 5th	• Retrieve the measuring tool (yarn tied to sticks) and ruler to create rows for planting. • Remind the students how they will use this tool to create four equally spaced rows in the bed. ○ Select 2 students to come forward and use the yarn tool to create a guide for the first row of seeds (a few inches away from the edge of the bed.) • Instruct them to stretch it out lengthwise across the bed and secure it in the soil. • Explain that when planting different plants in the same bed, it's best to understand how each plant grows so we can create the optimal growing situation for them – "tall plants in the back."

Grades	**Measure Soil Depth**
K – 5th	• The students might recall that all seeds like to be planted at a specific depth.[22] • Remind them that when planting seeds, we read the instructions on the packet to learn the directions for that seed, or we risk the seeds not sprouting. • Show them the seed packet laminates and point out the information on the back, calling attention to the ***depth***. • Demonstrate how to measure the depth on their finger with the ruler, starting at the tip of their index finger and measuring down their finger. • Hand off the ruler to your helper to assist the students with measuring the depth on their fingers.

Grades	**Place Seeds in Soil**
K – 5th	• Have the students form two lines in front of the bed for planting to receive their seeds. • Tell them to cover their seeds in their hands to avoid losing them. • Instruct them to approach the box two at a time and follow the yarn guideline to plant their seed beneath, making a straight row. • Direct them to poke a small hole, according to the depth they measured on their finger and drop in the seed.

	• Make sure they put the popsicle stick in the soil "above" their seed to mark the spot. • Have them pinch the soil to cover their seed with soil, leaving it fluffy and not patting the dirt down. • The next student approaching the box can see where the last seed was planted as indicated by the popsicle stick and determine where to plant their own seed. They will then move the popsicle stick to mark their own spot.

Grades	**Continue Planting**

K – 5th	• After planting, have each student move to the back of the line to receive another seed, if there are still more seeds.
	• As each seed row fills up, have the last students that planted in the row move the yarn tool to start a new row.
	• If students are capable, select a new student to come forward to label each row.
	• Give them a Sharpie and a plant label.
	  ○ Have them write the date on one side of the label and the plant name on the other.
	  ○ Instruct them to insert the label at the end of the row.
	  ○ Each row gets one plant label.
	• If students are too young, have your helper write the label and give it to the students to put into the soil.
	• Continue until two rows of each seed type are planted (four rows total.)

WATERING

(Grades 3rd – 5th Only)

Grades	**Watering the New Seeds**
K – 5th	• Now that the seeds are in the ground, they will remain in a dormant state until they are watered. Water stimulates the seeds to burst open, reach a root downward and a sprout upward. The sprout is the baby stage of the new plant. The root is both the sprout's anchor and its source for obtaining nutrients.[23]
K – 2nd	• Tell students that you'll give their seeds a thorough watering while they go back to class.
3rd – 5th	• Have your co-volunteer retrieve the half-filled watering cans and set them down in front of the bed. • Instruct students to form a line behind each watering can so they can take a turn watering. • Demonstrate how to lightly distribute the water by constantly moving the can side to side over the newly planted seeds, pausing as needed to avoid flooding. • Inform them that we always use a sprinkle top watering can for new seeds. ○ It is designed for gentle watering that simulates rain by distributing the water widely, allowing it to soak into the soil.

	○ We don't use watering cans with a stream spout for new seeds because the seeds would get pushed out of place from the big blast of water that would come out. This would happen because new seeds don't have roots to anchor them in place. • Allow each student to each have a 5-second turn before passing the can to the next student. • Once they finish their turn, have them join the co-volunteer for the "*LESSON REVIEW GAME – ALL GRADES*" (laminate.)

CLOSING

(ALL GRADES: 1 MINUTE)

- Bring students together to close the lesson and recap what they learned.
- Tell them that the crops will be ready to harvest in the middle of summer and volunteers will harvest and donate the produce to food banks to help feed others.
- Let them know that the volunteers will also plant seeds for them – so when they return in the fall, the garden should have new warm-season crops growing.
- If time allows, have students draw/write a "Reflection Page" after the lesson, either in the garden or with the teacher when they return to class.
- Thank the other volunteers and teacher.
- Thank the students for joining you today and all year in the garden.
- Dismiss them.

***Don't forget to report your lesson as delivered with the online form – scan here:**

Resources

[1] *Kid's Healthy Eating Plate*. (2017b, March 21). The Nutrition Source. https://www.hsph.harvard.edu/nutritionsource/kids-healthy-eating-plate/
[2] *Keeping Portions Under Control (for Parents) - KidsHealth*. (2018). Kidshealth.org. https://kidshealth.org/en/parents/portions.html
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[4]*Grocery Bag Botany*. (n.d.). Retrieved May 5, 2022, from https://dug.org/wp-content/uploads/2015/03/Grocery_Bag_Botany.pdf
[5] *Cool-season vs. Warm-season Vegetables*. (n.d.). Penn State Extension. https://extension.psu.edu/cool-season-vs-warm-season-vegetables
[6] Lerner, B., & Dana, M. (n.d.). *Growing Cucumbers, Melons, Squash, Pumpkins and Gourds*. Retrieved February 24, 2023, from https://www.purdue.edu/hla/sites/yardandgarden/wp-content/uploads/sites/2/2016/10/HO-8.pdf
[7] *Growing summer squash and zucchini in home gardens*. (2022). Extension.umn.edu. https://extension.umn.edu/vegetables/growing-summer-squash-and-zucchini
[8] *Guide to beans and legumes*. (n.d.). Mayo Clinic. Retrieved February 24, 2023, from https://www.mayoclinic.org/healthy-lifestyle/nutrition-and-healthy-eating/multimedia/beans-and-legumes/sls-20076082#:~:text=Beans%2C%20peas%20and%20lentils%20are
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[10]*Solanaceae*.(n.d.).Www.fs.usda.gov.https://www.fs.usda.gov/wildflowers/ethnobotany/Mind_and_Spirit/solanaceae.shtml#:~:text=The%20Solanaceae%2C%20also%20known%20as
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[12] *FS1279: Ultra-Niche Crops Series: Fresh-Market Basil (Rutgers NJAES)*. (n.d.). Njaes.rutgers.edu. Retrieved February 24, 2023, from https://njaes.rutgers.edu/fs1279/
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[15] Old Farmer's Almanac. (2019a, March 27). *Sunflowers*. Old Farmer's Almanac. https://www.almanac.com/plant/sunflowers
[16] *Sunflower Seeds and Oil | Food Source Information*. (2017, June). Colostate.edu. https://fsi.colostate.edu/sunflower-seeds-draft/
[17] *Soil Aeration Methods & Management: Benefits For Agriculture*. (2021, May 27). Eos.com. https://eos.com/blog/soil-aeration/
[18] *Choosing a Soil Amendment - 7.235*. (n.d.). Extension. https://extension.colostate.edu/topic-areas/yard-garden/choosing-a-soil-amendment/
[19] Gatiboni, L. (2011). *1. Soils and Plant Nutrients | NC State Extension Publications*. Ncsu.edu. https://content.ces.ncsu.edu/extension-gardener-handbook/1-soils-and-plant-nutrients
[20] *Soil Aeration Methods & Management: Benefits For Agriculture*. (2021, May 27). Eos.com. https://eos.com/blog/soil-aeration/
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