GARDEN EDUCATION: MODULE TWO
PLANTING COOL-SEASON CROPS

Helpful Bites

There is a lot of information to digest in the LiveWell Kids lessons. “Helpful Bites” is our way of providing a quick reference tool to the key points in each lesson. Please use it as a guide after you’ve read all the lesson content.

Lesson Objectives

- Learn about different crops and the seasons in which they grow.
- Understand how to prepare soil for planting.
- Learn and experience proper seed planting procedure.

Introduction to Lesson

- Prep all supplies.
- Communicate roles and responsibilities to lesson helpers.
- Start with mindful breathing exercise.
- Inform students they will be planting cool-season crops in their garden bed.
- Discuss how important vegetables are to our health, and that they will have a chance to harvest and taste what they have grown in the spring.
- Review proper planting procedure.

Soil Prepping and Planting

- While students work, use the talking points to educate them about the importance of each task.
- Aid with jobs, as needed.

Clean-up and Lesson Closing

- Give summary of what was planted and review the importance of each task.
- If time allows, have students help clean up.
- Bring students together to close the lesson and thank the teacher.
- If time allows, have students draw/write ‘Reflection Page’ after the lesson (either in the garden or with the teacher when they return to class).

After Lesson

- Give the seeds another thorough soaking after the class has left.
- Return all other supplies to the shed.
- Report your lesson as delivered with the online form: http://bit.ly/LiveWellGarden_19-20 or scan the QR code either at the top of this page or on the inside of the shed door.

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Education Standards

Please see Appendix A

Objectives

By the end of this lesson, students will:

- Learn about different crops and the seasons in which they grow.
- Understand how to prepare soil for planting.
- Learn and experience proper seed planting procedure.

Outline

1. Introduction
2. Soil Prepping
3. Seed Planting

Supplies

There is a **Planting Guide posted on the inside of the shed door that you will refer to during the planting section*

From the shed:

- 1 Ziploc bag, labeled by grade, containing 2 seed packs and plant labels
- Sharpies
- Cultivators
- Rake
- Watering cans
- Scissors
- Yarn
- Ruler
- Seed packet laminates
- Kneelers
- Optional: Gloves

Preparation

- Communicate with your co-docent or helper about your respective roles, making sure that you've both read the lesson plan before the lesson.
- Set cultivators near (but not right next to) the garden bed.
- Set the rake near (but not right next to) the garden bed.
- Fill watering can/s and set near (but not right next to) the garden bed.
- Cut a piece of yarn to be longer than the length of your bed and tie to a popsicle stick on each end. **Check to see if there is one hanging on the inside of the shed door that's already been used. If the beds are the same size, you can reuse it.**
- Take the ruler, yarn with popsicle sticks, bag of seeds and labels, 2 Sharpies and the seed packet laminates to your garden bed.
- Set the cut piece of yarn (tied to sticks) and the ruler near the bed and place everything else near (but not right next to) the garden bed.
- Optional: Place gloves and kneelers near (but not right next to) the garden bed.
- **Redondo schools only** - Remove the irrigation from the garden bed and place it away from where the kids will be working.

Introduction *1 minute*

Gather the students in the garden area and have them sit down on the grass or at the tables in a group. Greet the class and introduce any helpers to the class. Inform the class that this is the second garden education lesson of the year and that they will be planting cool season crops to be picked and tasted during the spring harvest lesson.

Mindful Breathing Exercise *1 minute*

Begin the lesson with a mindful breathing exercise. Have the students close their eyes and slowly take a deep breath in and out. Ask them to focus on what they hear, smell or feel. Have them take one more deep breath and then ask them to open their eyes.

Lesson Outline *1 minute*

- Inform the students they will be doing three tasks during this lesson:
    1. Prepare the soil for planting.
    2. Plant and label the seeds.
    3. Water the seeds.

- Each grade will plant two different cool season crops.
    - Kindergarten and 1st grade will plant **rutabagas** and **golden beets**.
    - 2nd and 3rd grades will plant **carrots** and **thyme**.
    - 4th and 5th grade will plant **shallots** and **winter greens**.

    At harvest time, all students will pick from all beds.

Growing Characteristics of Crops *1 minute*

- Rutabagas are root vegetables and grow underground.
- Winter greens grow as a leafy plant in various shades of greens, purples and reds.
- Carrots are root vegetables and grow underground.
- Shallots are bulbs and grow underground.
- Thyme grows as a short tiny-leafed herbaceous shrub.
- Golden beets grow as roots under the ground with the edible broad leaves above ground.

Preparing the Soil for Planting *12 minutes*

- At the garden bed, the students will gather on the opposite side of the bed so they can see you.
- Explain that they will plant in their garden bed. If they are sharing the bed with other classes, show them where your class will be planting.
- Let them know that the plants from the warm season have already been removed by the Garden Angels, who also amended the soil (unless the students are clearing them.)
- Ask if someone call tell you what it means to "amend" soil (choose a student with a raised hand to share the answer). *To amend soil is to add and mix in nutrients (usually in the form of compost) to the existing soil.*
- Ask if someone can tell you why we amend soil (choose a student with a raised hand to share the answer).
  We amend soil because the previous plants that grew in the same place already took the nutrients, leaving the soil depleted.
- Inform the students as you demonstrate that they will now cultivate, or 'fluff up' the soil in preparation for planting. Cultivating the soil "aerates" it, which means creating air spaces throughout the soil. There are several benefits to aerating soil.

- Here are a few:
    - 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.

Divide the class: determine how many students you can manage at the garden bed and send the rest with the co-docent or helper for the *Garden Trivia Game* (described below).

Group of Students with Docent at the Garden Bed

- Pass out the cultivators to the students that are left at the garden bed. Instruct the students to spread out around the box and cultivate as deeply as they can (kneelers and gloves may be used).
- Some plants have long roots that go deep down in the soil. The nutrients need to be that far down in the ground for the plant to absorb and make it healthy.
- Give them 3-4 minutes before switching groups.
- After the last group cultivates, gently rake the soil until it is level.

  If you have a bag of soil resting against your bed, this means that your soil level is low. Tear the bag open and spread contents on top of cultivated soil before raking.

Garden Trivia Game *12 minutes*

The co-docent or helper will take the students to an area nearby so that you can call students over to the garden bed when needed. Using the list of questions provided on the last page, the co-docent or helper will play a garden trivia game based on what students have learned so far. Allow for students to join and leave as directed by the docent who is at the garden box.

Plant and Label the Seeds (all students together) *10 minutes*

Refer to the Planting Guide inside the garden shed door to show you where to plant within the garden beds

Gather the class together at the bed. Explain that they will now plant crops that like to grow during the cool season. These plants do NOT like the long, intensely warm summer days. If we were to plant them in the summer, they wouldn't grow as well as they do in the cooler months. They like cooler air and soil, less intense sunlight, and less hours of light in a day than warm season plants.

Retrieve the measuring tool (yarn tied to sticks) and ruler to create rows for planting. Show the students how you use the tool to create four equally spaced rows in the bed by dividing the bed into quarters. Every child will plant seeds in the garden bed.

- Select two students to come forward and use the yarn tool to create a guide for the first row of seeds. 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. As plants grow, the taller plants block the sun from the shorter plants, while other plants spread out and crowd their neighbors. We can find some of the information that we need on the back of the seed packet.
- Tell them that all seeds like to be planted a specific depth. When planting seeds, we must read the instructions on the back of the packet to ensure that we are properly following 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*** highlighted in yellow.
- Demonstrate how you measure that depth on your finger with the ruler, starting at the tip of your index finger and measuring down your finger. This gives a visual of how far to push your finger into the soil when they make their planting hole. Hand off the ruler to your helper to assist the students with measuring the depth on their fingers.

- Have the students form two lines in front of the bed for planting while you pass out seeds. Remind the students to cover their seeds with their other hand to avoid losing it.
- Have the students approach the box two at a time and follow the yarn guideline to plant their seed beneath, making a straight row. Remind them of the seed depth that was highlighted on the laminate and measured on their finger. Direct them to follow this depth as they poke a small hole, drop in the seed. Place the popsicle stick in the soil "above" the spot where their seed is to mark the spot, then cover their seed with soil. 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 spot.
- After planting, have each student move to the back of the line to receive another seed.
- When the row fills up, select two new students to come forward. Demonstrate how to pinch a hole closed by gently pinching the dirt together over each seed hole, leaving it fluffy and not patting the dirt down. Allow them to finish pinching the holes in the row, starting from the middle and working out to the sides.
- If students are capable, select two new students to come forward and label the row. Give them a sharpie and a plant label. Have the write the date on one side and the plant name on the other. Instruct them to insert it at the end of the row. If they are too young, have your co-docent or helper write the label and give it to the students to put in the soil.
- Select two new students to come forward. Assist them in measuring and moving the yarn guide to the next row.
- Continue until two rows of each seed type are planted (four rows total). Make sure to select a new pair of students each time to move the yarn and write the labels.

Water the Seeds *4 minutes*

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.

- Have your co-docent or helper retrieve the half-filled watering cans and set them down in front of the bed. Instruct them to form a line behind each can to 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 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. This type of spout creates a stronger single stream of water which would push the seeds around or rinse them away since new seeds don't have roots to anchor them in place. Allow the selected students to each have a 5-second turn before passing the can to the next student.
- Once they finish their turn, have them return to the co-docent or parent helper for "Did You Know? Fun Facts."
- When the last student has finished watering, join the class and review the steps that they took today. Here are some questions that you can ask:
    - Why do we amend the soil?
    - Why is it important to aerate the soil?
    - Why does plant depth matter?
    - Who can tell me what we planted?

Thank them for doing such a wonderful job in the garden and tell them that when they return for the next lesson, the garden should have their cool-season crops growing. Dismiss the class.

Clean Up *5-7 minutes*

- Clean up by putting away all supplies.
- Soak your bed thoroughly before you go, using the 'mist', 'sprinkle' or 'shower' setting on your hose nozzle; the other settings are too strong for the seeds and might wash them away.
- Report that your lesson has been delivered on the online form: http://bit.ly/LiveWellGarden_19-20 or scan the QR code either at the top of page 1 in the lesson plan or on the inside of the shed door.

Resources

https://www.seedsavers.org/grow-shallot
http://saladplanet.com/30-interesting-and-fun-facts-about-salad/
http://servingjoy.com/fun-facts-of-lettuce/
https://www.gardeningknowhow.com/edible/vegetables/beets/growing-golden-beets.htm
https://www.organicfacts.net/health-benefits/herbs-and-spices/thyme.html
https://foodfacts.mercola.com/thyme.html
https://www.healthdiaries.com/eatthis/17-facts-about-thyme.html
www.thefloweringgarden.com/beet.htm
http://justfunfacts.com/interesting-facts-about-beets/
https://vegetarian.lovetoknow.com/Beet_Leaves
https://www.organicfacts.net/health-benefits/vegetable/rutabaga.html
http://district.schoolnutritionandfitness.com/northridgels/files/FFVP_pictures_and_fact_sheets/ffvp_info_sheet_RUTABAGA.pdf
https://www.healthbenefitstimes.com/rutabaga/
http://justfunfacts.com/interesting-facts-about-carrots/

Appendix A

Science Education Standards

K.SL.6: Speak audibly and express thoughts, feelings, and ideas clearly.
K.MD.1: Describe measurable attributes of objects, such as length or weight. Describe several measurable attributes of a single object.
K.CC.4: Understand the relationship between numbers and quantities; connect counting to cardinality.
1.L.5.c: Identify real-life connections between words and their use (e.g., note places at home that are cozy).
1.SL.6: Produce complete sentences when appropriate to task and situation.
2.SL.3: Asks and answers questions about what a speaker says to clarify comprehension, gather additional information, or deepen understanding of a topic or issue.
2.L.5.a: Identify real-life connections between words and their use (e.g., describe foods that are spicy or juicy).
2.L.5.b: Distinguish shades of meaning among closely related verbs (e.g., toss, throw, hurl) and closely related adjectives (e.g., thin, slender, skinny, scrawny).
2.MD.1: Measure the length of an object by selecting and using appropriate tools such as rulers, yardsticks, meter sticks, and measuring tapes.
2.MD.3: Estimate lengths using units of inches, feet, centimeters, and meters.
3.SL.4: Report on a topic or text, tell a story, or recount an experience with appropriate facts and relevant, descriptive details, speaking clearly at an understandable pace.
CCSS.MATH.CONTENT.3.MD.B.4: Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch.
4.MD.B: Represent and interpret data.
CCSS.MATH.CONTENT.4.OA.A.1: Interpret a multiplication equation as a comparison.
4.MD.A: Solve problems involving measurement and conversion of measurements.
5.MD.B: Represent and interpret data.
5.OA.B: Analyze patterns and relationships.
CCSS.MATH.CONTENT.5.NF.B.7.C: Solve real world problems involving division of units by whole numbers and division of whole numbers by unit fractions.

Garden Trivia Game *12 minutes*

Have the students spread out and ask them to remain standing. Explain to them that this a "True and False" game. You will read each statement out loud, and they will decide if they think it is true. If they think it's true, they stay standing. If they don't think it's true, they will sit down. You will reveal the answer to see how many got it right. Have all students return to standing and repeat with the next statement. If you want, you can have students raise their hands and call on a student to explain why they believe a statement is true or false. Feel free to come up with your own questions, too!

ALL GRADES

- Removing old plants makes room for the new developing plants to grow. *True*
- Removing old plants helps aerate the soil, creating air spaces between the soil particles which have become compacted over time. *True*
- A seed has everything it needs to nourish itself while it grows until its roots are formed. *True*

KINDERGARTEN

- Carrots grow as roots under the ground with the feathery leaves above ground. *True*
- You can eat beet greens. *True*
- Vegetable roots grow above ground. *False: Roots almost always grow underground.*

1ST GRADE

- Both walking and running are allowed in the garden, but no jumping. *False: No running in the garden.*
- Soil needs to be soft and loose so that water can soak in and reach the deeper layers. *True*
- Rutabagas grow on a shrub. *False: Rutabagas grow underground.*

2ND GRADE

- All carrots are warm season crops. *False: Carrots are cool season crops.*
- Sometimes a plant won't grow because it's not planted deep enough, or it's planted too deep. *True*
- Decomposers that live in the soil need air spaces so that they can breathe and move around. *True*

3RD GRADE

- Shallots grow above ground as a bulb-shaped stem. *False: Shallots grow as underground bulbs with their green leaves above ground.*
- Most greens like to grow in the warm season. *False: Most greens like to grow in the cool season.*
- Sometimes plants won't grow because the seeds are too old. *True*

4TH GRADE

- You can plant thyme in both the warm and cool seasons, and it will grow and thrive just the same. *True: Thyme is a perennial plant.*
- Soil needs to be light and fluffy so fragile seedlings can push their hair-like roots through. *True*
- You can plant a good seed in poor soil, and it will still grow and thrive. *False: Seeds need to take in nutrients from the soil to grow and thrive.*

5TH GRADE

- Carrots are in the same family as beets, growing an edible root underground with greens on top. *False: Carrots are in the **Apaceae** family, along with celery and parsley, while beets are in the Beta Vulgaris family, along with Swiss Chard.*
- It doesn't matter how deep you plant a seed, if it gets plenty of water it will thrive. *False: Each seed type requires a specific depth to grow and thrive.*
- We amend soil because the previous plants that grew in the same place already took the nutrients, leaving the soil depleted. *True*

Did You Know? Fun Facts!

Rutabaga

- Rutabaga (*Brassica napus)* is a cruciferous vegetable that is known around the world as "swede" but is called rutabaga primarily in North America. The name "Rutabaga" comes from an old Swedish word: rotabagge— which means 'root bag'.
- Rutabagas are a cross between a turnip and a cabbage, but they look much more like a turnip.
- Even though Rutabagas are grown as annuals for culinary purposes, they are **biennial** plants, taking 2 years to complete their life cycle, producing seeds during the SECOND year of growth.

Thyme

- Thyme is perennial plant which means that it can survive more than two years in the wild.
- Thyme is known for its antibacterial and disinfectant properties.
- There are more than 100 varieties of thyme.

Golden Beets

- The leaf, leaf stalks and roots of beet plants are edible. The leaves are high in vitamin A and minerals including calcium, iron, potassium and magnesium.
- Beets have been around since 800 BC and used commonly by 812 AD. By 1975, the beet was made into a Borscht soup and sent to the Apollo 18 astronauts.
- While beets themselves are rich in calcium, vitamin A, iron and other healthy minerals, their leaves are excellent sources of vitamin A, vitamin C, protein and dietary fiber.

Shallots

- Shallots are part of the lily family.
- In America, a shallot is a small brown bulb of onion; but in Australia, the word shallot is used to reference the small green onion known to Americans as a scallion.
- Shallots are part of the Alliaceae (ally-AY-see) family, the same genus as garlic, leeks and onions.

Winter greens

- Green leafy vegetables are very healthy, chock-full of vitamins, minerals, antioxidants and other substances that provide a myriad of health benefits for the body. Most tend to be very high in vitamins A, C & K.
- According to historical documents, lettuce was already cultivated in Ancient Egypt as far back as 6,000 years ago and is portrayed in several Egyptian hieroglyphs and artwork.
- Eating greens is vital to staying healthy, strong and protecting our immune system.

Carrots

- Carrots were originally white **or** purple**.** Then a yellow carrot appeared through mutation and the familiar orange carrot was bred from it.
- The biggest carrot recorded is more than 19 pounds and the longest is over 19 feet!
- Carrots clean your teeth and mouth. They scrape off plaque and food particles just like toothbrushes or toothpaste.