



LiveWell Kids Garden and Nutrition Program

Lesson 3: Soil Health & Minerals

KINDERGARTEN

OBJECTIVES

By the end of this lesson, students will:

- Realize the role of nutrients in the garden and our bodies. (K-5)
- Understand what makes a healthy growing medium. (K-5)
- Understand the benefits of composting and vermiposting (worm composting). (K-5)
- Increase ability to make healthy food choices by being aware of nutrients in food and how to get them. (K-5)

SUPPLIES AND SET-UP

- Garden activity – discussion portion
 - Laminated: *Landfill*
 - Laminated: *Do the Rot Thing...Compost!*
 - Laminated: *Decomposers in the Compost Pile*
 - Laminated: *Compost Cycle*
 - Place laminates where they are accessible for discussion during garden activity.
- Garden activity – relay: “Compost, Recycle or Trash?”
 - 2 sets (one green, one blue) of laminated half-page cards with drawings
 - Pink laminated “Compost”, “Recycle” and “Trash” card key
 - 3 full-page laminated cards labels: “Compost”, “Recycle” and “Trash”
 - 3 small collapsible bins
 - Set bins on the ground with a card label in front of each one.
 - Place the green and blue card sets on the ground across from the bins where students will line up in 2 lines behind them.
 - Place card key where it is accessible for checking answers after relay.
- Nutrition activity - “Eating the Rainbow, Colorful Fruits & Vegetables”
 - Laminated: *Benefits of Eating from the Rainbow*
 - Place laminate where it is accessible for discussion.

PREPARATION

- Refer to the [LiveWell Kids Volunteer Manual](#) on the [LiveWell Kids webpage](#) for details about preparing for the lesson one week prior and the day of. The information can also be found on the inside of the shed door.
- Allow **30 minutes** for set-up and preparation on the day of the lesson.

**INTRODUCTION & MINDFUL BREATHING (1 MINUTE)**

- Introduce yourself and other volunteers.
- Guide students through a mindful breathing exercise.
- Explain the purpose of this third lesson is to better understand the benefits of composting and the role of minerals in the garden and our bodies.

****Divide the class into 2 groups****

Split the students into two groups. Send one group with the helper/teacher to the nutrition activity. Take the other group to the garden activity. Both activities will run simultaneously for a total of 20 minutes. Switch groups after 10 minutes.

GARDEN: DISCUSSION (10 Minutes)

Soil Health
<p>What is “Soil Health”?¹</p> <p>Soil health is the continued capacity of soil to function as a vital living ecosystem that sustains plants, animals, and humans. Healthy soil gives us clean air and water, bountiful crops and forests, productive grazing lands, diverse wildlife, and beautiful landscapes. Soil does all this by performing five essential functions:</p> <ul style="list-style-type: none"> • Regulating water Soil helps control where rain, snowmelt, and irrigation water goes. Water flows over the land or into and through the soil. • Sustaining plant and animal life The diversity and productivity of living things depends on soil. • Filtering and buffering potential pollutants The minerals and microbes in soil are responsible for filtering, buffering, degrading, immobilizing, and detoxifying organic and inorganic materials, including industrial and municipal by-products and atmospheric deposits. • Cycling nutrients Carbon, nitrogen, phosphorus, and many other nutrients are stored, transformed, and cycled in the soil.

• Providing physical stability and support
 Soil structure provides a medium for plant roots. Soils also provide support for human structures and protection for archeological treasures.

It's important to care for our soil so it will be able to produce the nutrient-dense food that we want, season after season.

Some of the ways we can care for our soil in the garden is by putting nutrients back into the soil. We can do this by making compost and worm tea to add to our garden beds.

Composting: Definition & Benefits

- What is **composting**? Composting is the process of creating a controlled environment, such as a compost bin, where we can copy nature's process of plant materials breaking down into useful nutrients for growing plantsⁱⁱ.
- Three Benefits of compostingⁱⁱⁱ:
 1. Reduces waste
 2. Beneficial to soil
 3. Saves money

Benefit #1:	Composting Reduces Waste Supplies: <i>Landfill</i>
	<ul style="list-style-type: none"> • Everything that we put in the trash ends up in a place called a <i>landfill</i>. <ul style="list-style-type: none"> ○ In landfills, the trash is buried in the ground for many years and is of no use to anyone; it's just taking up space. ○ Imagine what it would look like and smell like if all your trash from home was buried in the backyard! • When we compost, we put less waste into landfills. Just like reusing and recycling, we can think of composting as nature's recycling.
Benefit #2:	Composting Is Beneficial to Soil Supplies: <i>Compost Cycle</i>
	<ul style="list-style-type: none"> • Compost contains nutrients that are vital to a healthy soil, just like nutrients are vital to your body. • What are nutrients? <ul style="list-style-type: none"> ○ A <i>nutrient</i> is a substance found in food that provides the nourishment we need to grow and thrive.^{iv} • How do the nutrients get into the soil? <ul style="list-style-type: none"> ○ Organisms that eat organic matter, break it down into smaller and smaller pieces until it's in a useable form for plants to access the nutrients.^v • Compost is an example of the nutrient cycle at work. <ul style="list-style-type: none"> ○ The nutrient cycle is the natural process of nutrients being recycled from dead matter to living matter in a constant loop.^{vi} ○ The image (on laminate) shows how the nutrient cycle happens when people compost – this is called the compost cycle.^{vii}

Benefit #3:	Composting Saves Money
	<ul style="list-style-type: none"> • The healthier our soil is, the healthier our plants will be. • When we make compost, we use it to amend, or <i>improve the health of</i> the soil. <ul style="list-style-type: none"> ○ If we didn't make compost, we would have to buy it from the nursery, or garden center, to amend our soil. <p>By making it ourselves through composting, we can save money.</p>

Ingredients for a Composter	Supplies: <i>"Do the Rot Thing...Compost!"</i>
	<ul style="list-style-type: none"> • Every school garden in the LiveWell Kids program has composters (show composters.) • There are four ingredients the compost bin/tumbler needs to recycle organic materials into usable compost: <ul style="list-style-type: none"> ○ Air ○ Water ○ Organic green materials ○ Organic brown materials
How to Make Compost	Supplies: <i>"Do the Rot Thing...Compost!"</i>
	<ul style="list-style-type: none"> • Ask: Who can give an example of <i>green materials</i>? <ul style="list-style-type: none"> ○ <i>Green materials are the fresh plants and plant parts that get put in the compost. Here are some examples: fresh cut grass, vegetable scraps, fruit scraps, coffee grounds, manure and green leaves.</i> • Ask: Who can give an example of <i>brown materials</i>? <ul style="list-style-type: none"> ○ <i>Brown materials are the dried, brown plants and other non-green things that are put in the compost. Here are some even examples: dried grass, brown leaves, dead flowers and plants, paper and eggshells.</i> • <i>On the laminate, point out the F.B.I.</i> <ul style="list-style-type: none"> ○ FBI stands for Fungus, Bacteria and Invertebrates; these are responsible for eating everything in the composter. Examples include worms, millipedes and pillbugs (also called sowbugs and roly-pollies), pincher bugs and centipedes.
Vermiposting	Supplies: <i>Worm Bin</i>
	<ul style="list-style-type: none"> • • There is more than one way to add nutrients to soil. • The school garden has a worm bin. • Worms live in this structure and are fed fresh produce scraps each week. • Gardeners call their waste "liquid gold!" It's periodically added to the garden beds for a nutrient boost. <p>Using the worms to make nutrients for the garden is called Vermiposting or Vermicomposting.^{viii}</p>

GARDEN ACTIVITY

Activity	“Compost, Recycle or Trash?”
	<ul style="list-style-type: none"> • Divide the students into 2 lines, one behind each of the blue and green card sets. • Be sure the 3 bins with card labels are far enough away so the students have room to run during the relay game. • When you say, “Go!”, the students in the front of each line will pick up the first card on their stack and determine which bin it will go in: “Trash”, “Recycle” or “Compost”. • They will then run to the appropriate bin and place the card inside. • As the student returns, they tag the next student to go, and so on, until the cards are gone. • Returning students join in the back of their line until the cards are gone. • Once the relay is over, use the card key to check the answers. The team with the most correct answers wins.

NUTRITION: MINERALS WE EAT (10 Minutes)

*** Occurs at the same time as Garden Activities*

The nutrition section has two parts:

1. Nutrients Discussion (differs by grade)
2. Activity

	<p>Nutrients</p> <p><i>This section is about getting nutrients – both food and water are nutrients. We need nutrients.</i></p>
Discussion	<ul style="list-style-type: none"> • Just like soil needs nutrients, so do people. • This is especially important for all of you because you are still growing. Your body needs nutrients to grow strong, healthy bones and muscles. • Nutrients also give you the energy to run around the playground, catch a ball, dance and learn in school. • People get nutrients from food and water. • The following imagery may help clarify the concept: <ul style="list-style-type: none"> ○ Think of a carrot that you built out of Legos. Each Lego piece is a different nutrient. Different nutrients, or Lego pieces, do different things that our bodies need. Nutrients can be vitamins, such as vitamin A, which is found in carrots and spinach for example. So, your Lego carrots and spinach would have lots of vitamin A Lego pieces. Nutrients can also be minerals, such as potassium, which is in bananas and potatoes. Carbohydrates, fats, proteins, and water are other examples of nutrients. Keep in mind that foods can have a bunch of different nutrients in them. Therefore, your Lego carrot not only has vitamin A Lego pieces, but it also has vitamin K, vitamin C, potassium,

	fiber, calcium and iron Legos too. That’s a lot of good-for-you nutrients – or Legos!
	<p>Eating the Rainbow: Colorful Fruits & Vegetables</p> <p>Supplies: <i>Benefits of Eating from the Rainbow</i></p>
Discussion	<ul style="list-style-type: none"> • Fruits and vegetables are an important part of what you eat because they’re packed full of nutrients that help your body feel its best. • Like the rainbow, fruits and vegetables come in many colors. • Every color is good for you in its own special way.^{ix, x} • Show <i>Benefits of Eating from the Rainbow</i> and ask the class to think about the colorful fruits and vegetables that they’ve eaten and those that they would like to try. <ul style="list-style-type: none"> ○ Can you name some red fruits and vegetables? <ul style="list-style-type: none"> ▪ Examples: strawberries, tomatoes, apples, red pepper and watermelon ▪ Red helps keep your heart healthy and is good for memory. ○ Who can share some orange fruits and vegetables? <ul style="list-style-type: none"> ▪ Examples: peaches, oranges, orange peppers and carrots ▪ Orange keeps your eyes healthy and fights off illness. ○ Next, can you name some yellow fruits and vegetables? <ul style="list-style-type: none"> ▪ Examples: bananas, lemon, yellow peppers and pineapple ▪ Yellow helps fight off sickness and also protects your eyes. ○ Can you name a few green fruits and vegetables? <ul style="list-style-type: none"> ▪ Examples: peas, spinach, broccoli and cucumbers ▪ Green keeps your bones, teeth and nails healthy and strong. ○ How about blue and purple fruits and vegetables? <ul style="list-style-type: none"> ▪ Examples: blueberries, grapes, eggplant, plums and red onions ▪ Helps memory and protects your body from disease. ○ Finally, can you share examples of white vegetables and fruits? <ul style="list-style-type: none"> ▪ Examples: cauliflower, garlic, mushrooms and potatoes ▪ Keeps your bones strong and lowers cholesterol and blood pressure. • The next time you go to the grocery store or farmer’s market, take a look around and think about all of the new fruits and vegetables you can try eating! <ul style="list-style-type: none"> ○ Sometimes you may need to try a new food several times before deciding if you like it, so don’t be shy and give it a try! • Whether you’re having breakfast, lunch, dinner or a snack, it’s always a good time to color your plate with a variety of fruits and vegetables.
Activity	<p><u>Carrot Jump</u>^{xi}</p> <ul style="list-style-type: none"> • Game description: Today we will play a game where we all get to move around while sharing what we learned about colorful fruits and vegetables. • Everyone stands in a circle together. • One student is selected to: <ol style="list-style-type: none"> 1) Name a color.

	<ol style="list-style-type: none">2) Pick a fruit or vegetable of that same color.3) Add a movement.4) Example: A student says, “orange carrot jump” and everyone jumps. <ul style="list-style-type: none">• The next person must think of another vegetable or fruit and another movement, such as “red apple spin.”• Remind students that they can ask for help at any time.• Continue until everyone has a turn.• If the children cannot think of movements, the volunteer can add the movement after the child has said the piece of food.• For children with impairments in flexibility or gross motor skills, or who are injured, encourage them to perform the movements as much as they can, understanding that it may look different to others.
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CLOSING (1 MINUTE)

- Bring students together to close the lesson and thank the students, teacher and other volunteers.
- Point out to them that composting is easy and they can do it at home.
- Take them to see how their garden box is growing before going back to class.
- If time allows, have students draw a Reflection Page and take a few photos to share with BCHD at Mishell.Balzer@bchd.org.
- Thank the students for joining you today and dismiss them.

***Don't forget to report your lesson as delivered with the online form!**

Scan this QR code with your phone for scheduling and reporting lessons as delivered:



From the computer, click the link that was emailed to you by your Lead Volunteer:

[LiveWell Kids Tracking Links 2024-25](#)

Resources

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- ⁱ USDA. "Http://Www.nrcs.usda.gov/Conservation-Basics/Natural-Resource-Concerns/Soils/Soil-Health." *Natural Resources Conservation Service*, 2024, www.nrcs.usda.gov/conservation-basics/natural-resource-concerns/soils/soil-health.
- ⁱⁱ Hu, S. (2020, July 20). *Composting 101*. NRDC. <https://www.nrdc.org/stories/composting-101>
- ⁱⁱⁱ US EPA. (2018, October 16). *Composting At Home | US EPA*. US EPA. <https://www.epa.gov/recycle/composting-home>
- ^{iv}^a MedlinePlus. (2021, July 23). *Definitions of Health Terms: Nutrition: MedlinePlus*. <https://medlineplus.gov/definitions/nutritiondefinitions.html>
- ^v *Decomposers and Scavengers - NatureWorks*. (n.d.). Nhpbs.org. <https://nhpbs.org/natureworks/nwep11.htm>
- ^{vi} *Nutrient Cycling - an overview | ScienceDirect Topics*. (2015). Sciencedirect.com. <https://www.sciencedirect.com/topics/earth-and-planetary-sciences/nutrient-cycling>
- ^{vii} *The Compost Cycle | StopWaste - Home, Work, School*. (2022). Stopwaste.org. <https://www.stopwaste.org/at-home/home-and-community-gardening/the-compost-cycle>
- ^{viii} *soilcollege*. (n.d.). www.sas.upenn.edu. <https://www.sas.upenn.edu/~jbryson/soilcollege.html#:~:text=Soil%20Organisms%20are%20generally%20grouped>
- ^{ix} Anonymous. (2020, February 24). *Brighten Your Plate by Choosing Colorful Fruits and Vegetables*. Cns. <https://cns.ucdavis.edu/news/brighten-your-plate-choosing-colorful-fruits-and-vegetables>
- ^x *Eat the rainbow*. (n.d.). www.safetyandhealthmagazine.com. <https://www.safetyandhealthmagazine.com/articles/20391-eat-the-rainbow>
- ^{xi} "Carrot Jump." *Appetite to Play*, appetitetoplay.com/physical-activity/movement-locomotion/carrot-jump. Accessed 20 Oct. 2023.