



LiveWell Kids Garden and Nutrition Program

Lesson 3: Soil Health & Minerals

FIRST GRADE

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 - "Compost Observation"
 - Laminated: *Landfill*
 - Laminated: *Do the Rot Thing...Compost!*
 - Laminated: *Decomposers in the Compost Pile*
 - Laminated: *Compost Cycle*
 - 2 cafeteria trays
 - Box of magnifying lenses
 - Box of tweezers
 - Book: *Compost Stew*
 - 2 scoops of compost from the composter
 - **Bring from classroom:** 1 piece of paper per student, and drawing tools (i.e. Colored pencils, markers, crayons)
 - Place the cafeteria trays on the picnic tables with a scoop of compost on each, preferably in 2 different stages of decomposition.
 - Place the rest of the supplies on the table.
- Nutrition activity – Whole Foods
 - *Food Cards*
 - Place Food Cards where they are 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 nutrient 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>

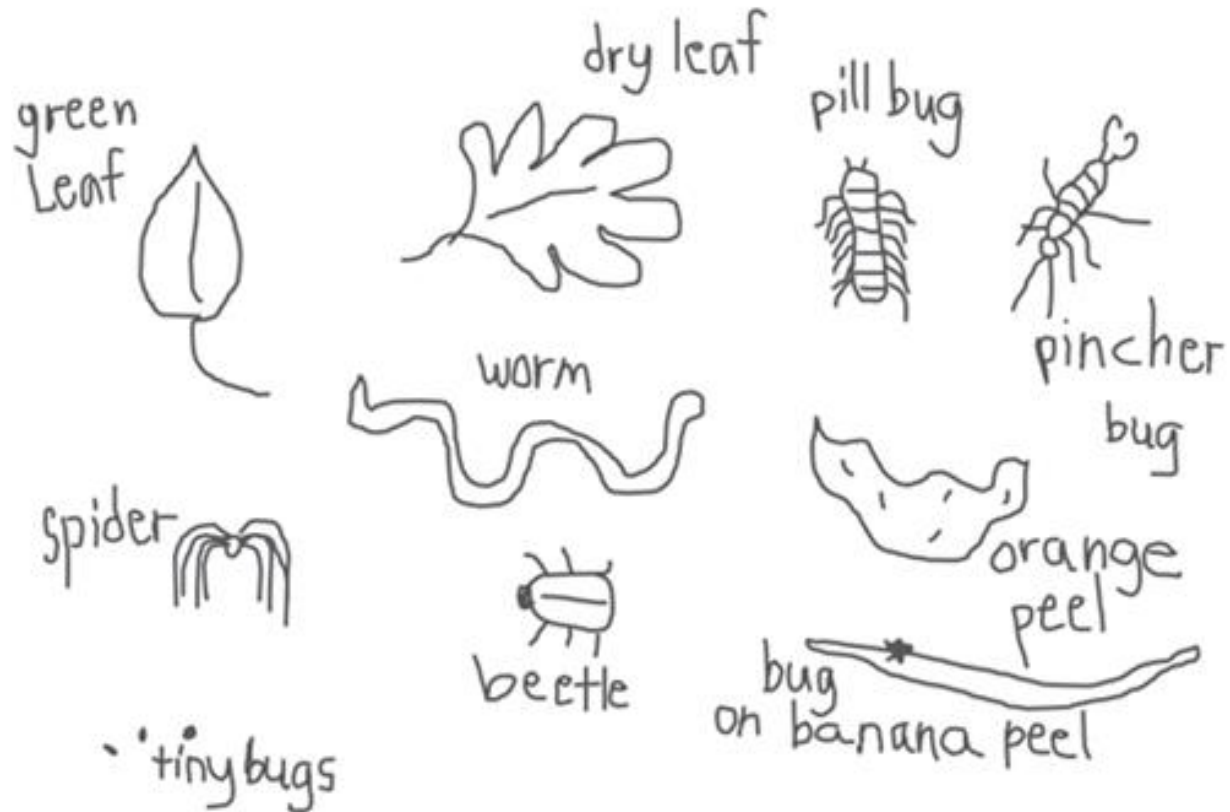
Ingredients for a Composter	Supplies: <i>"Do the Rot Thing...Compost!"</i>
	<ul style="list-style-type: none"> • Every school garden in the LiveWell Kids program has composters (show composters.) • There are four ingredients the compost bin/tumbler needs to recycle organic materials into usable compost: <ul style="list-style-type: none"> ○ Air ○ Water ○ Organic green materials ○ Organic brown materials • Why are these ingredients necessary? <ul style="list-style-type: none"> ○ There is life in the compost bin: decomposers, which are the organisms that eat organic matter, like all life, needs food, air, and water to survive. ○ We are feeding our decomposers – like taking care of pets! ○ Without the decomposers, organic matter would not break down, but would just pile up.
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. They are called decomposers. <p>Examples include worms, millipedes and pillbugs (also called sowbugs and roly-pollies), pincher bugs and centipedes.</p>

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 <i>Vermiposting</i> or <i>Vermicomposting</i>.^{viii}</p>

GARDEN ACTIVITY

Activity	“Compost Observation”
	<ul style="list-style-type: none"> • Show the example drawing on the whiteboard complete with decomposers, greens and browns labeled. • Show students the trays of compost, letting them know that you scooped it from their compost bin. Have them observe the compost with magnifying lenses. If there isn’t enough room for all students to observe at once, spend 1-2 minutes per small group before switching. • While students wait for their turn, have them begin drawing a compost bin with greens and browns that they know could go in the compost. • After they have observed the compost, they can add what they observed to their drawings. • Have them label what’s in their drawing. Feel free to help label pictures as needed. • Have them label all the other components of the compost pile also, such as “air” and “water.” • Encourage them to draw specific materials like torn egg carton or an apple core. • If they know the names of specific decomposers, they can also draw and label them by name, or just write, “decomposer.” • If you have more than one helper or if your teacher is available, feel free to use the <i>Compost Stew</i> book to show the kids while they are waiting for their turn to use the magnifying lenses. If the students are older, they can look through the book without adult monitoring, or read it aloud to the rest of the group.

Sample Drawing:



NUTRITION: MINERALS WE EAT (10 Minutes)

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

The nutrition section has two parts:

1. Nutrients Discussion
2. Activity

	<p>Nutrients <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. • For younger students, 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

	<p>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>
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	<p>Whole Foods</p> <p>Supplies: <i>Food Cards</i></p>
Discussion	<ul style="list-style-type: none"> • Ask: Who has been to a grocery store? • Ask: What do you find at a grocery store? • Ask: What are some foods that you like to get at the grocery store? • Today, we are going to talk about some foods at the grocery store that have lots of nutrients that our bodies need to help us stay healthy. • Choose a variety of <i>Food Cards</i> as examples of whole foods. <ul style="list-style-type: none"> ○ Ask: What do you notice about these foods? <ul style="list-style-type: none"> ▪ These foods are called whole foods. • Whole foods are as close to their natural form as possible. This means that they haven’t been changed (or at least very little) from how they are in nature. <ul style="list-style-type: none"> ○ For example, an orange is a whole food. When you see it in the store or in your refrigerator at home, it looks just like it does when it’s still on an orange tree. ○ Whole foods come from plants and animals. ○ Whole foods don’t have other items, like sugar, added to them. ○ They also don’t have nutrients, like vitamins, taken out of them. • Ask: Let’s think of examples of whole foods together. In addition to an orange, can someone name another fruit that’s a whole food? <ul style="list-style-type: none"> ○ VOLUNTEER NOTE: A correct answer is any fruit that isn’t moderately or highly processed – more than peeled, sliced or frozen. Consider mentioning that fruit in a can with syrup/juice is not considered a whole food because it has added sugar. • Ask: How about a vegetable that is a whole food? <ul style="list-style-type: none"> ○ VOLUNTEER NOTE: Consider mentioning that french fries from a restaurant aren’t whole foods even though they are made from potatoes. They have added salt, oil and are often fried. • Ask: Do you know that beans, nuts and seeds are also whole foods? <ul style="list-style-type: none"> ○ These include peanuts, walnuts, sesame seeds, black beans and more! • Ask: Chicken, turkey, fish, beef and other meats are whole foods too. • Ask: What whole food comes from a chicken? Eggs! • Ask: Do you enjoy a glass of milk? Milk is a whole food. • Ask: Have you eaten foods made with whole grains? These foods have lots of nutrients too.

	<ul style="list-style-type: none"> ○ Grains are actually the seeds of grasses grown for food!^{ix} ○ Whole grains come from plants like wheat, corn, rice, and oats. Bread, pasta and tortillas made with whole grains are yummy!
Activity	<p><u>Whole Foods Go!</u> (Played like Red Light, Green Light)</p> <ul style="list-style-type: none"> ● Game description: Today we are going to practice our whole foods knowledge by playing a game called, “Whole Foods Go!” ● Line up the students, one next to the other, so they form a horizontal line in front of you. ● Stand a running distance away, like how you would if playing Red Light, Green Light. ● Explain how to play the game: <ul style="list-style-type: none"> ○ You will shout out different names of foods, such as “apple,” “pie,” “carrot” or “pizza.” ○ If the food is a whole food, then the students will take one step forward. ○ If the food you name is not a whole food, then the students will remain in place. ● The goal is for the students to recognize enough whole foods so they move forward and end up where you are standing.

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

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} Mayo Clinic. "The Whole Truth about Whole Grains." *Mayo Clinic*, 10 Dec. 2022, www.mayoclinic.org/healthy-lifestyle/nutrition-and-healthy-eating/in-depth/whole-grains/art-20047826.