



FOR YOUTH DEVELOPMENT®
FOR HEALTHY LIVING
FOR SOCIAL RESPONSIBILITY

Day 4: Compost Quest

Quick Glance

In this lesson, campers will:

- ✓ Explore issues with access to healthy food (OLDER CAMPERS ONLY)
 - ✓ Discover what compost is and why it is good for the garden
 - ✓ Identify different types of compost
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Tasks

- ✓ Hands-on gardening
- ✓ Informally discussing food justice issues
- ✓ Exploring compost

Day 4: Compost Quest

About:

Campers learn about composting: how and why it's done and its value in the garden. Campers participate in daily gardening tasks.

Achievement-Based Objectives:

These describe what the camper will have learned and might apply during and beyond the gardening session. At the end of this lesson, campers will have:

Applied gardening skills and knowledge

Explored food justice issues

Examined the composition and value of compost

Lesson Focus:

Composting as a sustainable gardening practice that also promotes reduction of food waste, vermicomposting, gardening, and food justice.

Grade Level	Time	Main Topic
4-6	60 minutes	Composting

NOTES

- Campers begin the session in the garden before delving into the composting lesson. However, if desired, the entire session can center on gardening tasks.
- As with the other lessons, instructors can order the task in ways that they work best for the groups they lead

Materials and Prep:

Prepare the following materials before the session. Handouts and items to duplicate and/or enlarge are in **Lesson Docs** at the end of the lesson.

Task	Items	Preparation
Starter	<ul style="list-style-type: none"> ✓ Doc 1: What campers will learn ✓ Self-adhesive chart paper ✓ Markers 	Reproduce the camper-friendly objectives on chart paper. Find a place near the garden to post and also in an indoor classroom, where rainy-day gardening tasks take place.
Gardening	Doc 2: The Tomato's Story	Photocopy if it is to be distributed.
Composting	<ul style="list-style-type: none"> ✓ Doc 3: Compost Quest ✓ Existing compost bin and compost ✓ Worm compost bin (NOTE: If bins don't exist for regular and worm composting, gather materials for campers to make the bins.) ✓ Examples of what can and cannot go into compost (browns and greens, meat, dairy items, paper, etc.) ✓ Garden or latex-free rubber gloves ✓ Magnifying glasses 	<ul style="list-style-type: none"> ✓ Arrange sample piles of compost for campers to examine ✓ Arrange compostable and non-compostable items for campers to explore

Procedures Part I Time: 30 min.

Step	Task 1: Starter
1	When campers arrive, if desired, invite them take a quick look around the garden to check in. They will have more time in the garden later.
2	Have everyone sit in a circle. Ask the group if any gardening thoughts have come to mind that they want to share. Record questions and comments. Provide feedback where you can, and if you can't, tell campers you will get back to them.
3	Share what campers will learning, referring to Doc 1: What campers will learn.

Step	Task 2: Gardening
4	Tasks are assigned as needed.
5	OPTION FOR OLDER CAMPERS: While gardening, campers can have an informal discussion about the value of gardens when it comes to healthy eating, access to fresh food, sustainability, and related food justice topics. One way to jumpstart that discussion is by reading aloud Doc 2: The Tomato's Story . Discussion prompts with key talking points follow the story.
6	Make sure there are at least 10 minutes set aside for clean up after gardening: returning tools to storage, putting the hose away, turning off water, etc.

	Task 3: Compost Quest
	NOTE: This task assumes that campers will have some sort of composting engagement, whether it is building bins or contributing to them. A useful source about compost is "Do the Rot Thing" www.cvsamd.org/uploads/6/1/2/6/6126179/do_the_rot_thing_cvsamd1.pdf . Some of the composting background in this task is from this source. If composting becomes a central component of the gardening curriculum, use the "Do the Rot Thing" materials.
7	Review with campers what soils are generally best for vegetable and fruit gardening. If they talk about soil with organic matter, ask them why that's important for healthy soil.
8	Probe with the group what is one thing that can be used that adds organic matter to soil; fertilizes soil without chemicals; and is a sustainable gardening/agriculture method. Give hints if needed, e.g., <i>This is often kept in a bin or container in the garden. This looks like soil. It has food in it.</i> And so on. Affirm contributions, particularly those of campers who discuss compost.
9	Ask campers what compost is and what it does. Validate camper contributions and provide background on compost, as presented in Doc 2: Compost Quest .
10	Invite campers to visit each type of compost bin to do a quick observation of the different types of compost. Tell them to use their senses: sight, smell, touch. What do they notice?

11	Focus on standard composting. Set out a variety of greens and browns, along with items that are not compostable. Have campers work in teams to decide what can and can't go in the compost bin. Explain what is compostable. Demonstrate how to compost using layers of browns and greens.
12	Ask campers to think about the benefits of compost (soil, environment, preventing food waste, and so on). Explain that in addition to the composting that occurs in the cafeteria, they will have an opportunity to contribute to the composting systems in the garden.
13	Encourage campers, where possible, to bring food scraps (understanding that they cannot keep these in their cabins overnight, but if they come to the session after breakfast, for example, they can bring some scraps with them. Encourage the collection of greens and browns from the garden for the compost bins.)
14	OPTIONAL (Perhaps in lieu of the compost exploration): Campers walk through the cafeteria composting process.

Step	Task 6: Discussion
15	Invite campers to share what they learned about composting and why it is especially important in the garden.

LESSON DOCS

Doc 1: What campers will learn

Doc 2: The Tomato's Story

Doc 3: Compost Quest

Doc 1: What campers will learn

Reproduce the following on a sheet of self-adhesive chart paper. Post so campers can see the list. Modify accordingly.

You, the campers, will learn:

- ✓ About issues with access to healthy food (FOR OLDER CAMPERS ONLY)
- ✓ What compost is and why it is good for the garden
- ✓ About different types of compost

Doc 2: The Tomato's Story

You want to know where food comes from?

Well, Ms. Tomato here, sharing my story so you can get the picture.

Whoa! Let-me-tell-you...I've just traveled ALL the way from California. What a LONG journey! I had no idea it would take me this long. Phew...

It all started one Thursday morning when I was rudely woken up by a rough hand yanking on my vine. What a lousy way to wake up! It was WAY too early. I wasn't ready to be picked! I was still green. Oh man, I was not happy! The person picking me must have sensed my unhappiness because he leaned over and apologized as he tore me from my bed. He said that it wasn't his choice to pick me. He was just an underpaid worker following the orders of the farm boss. It's not like his life was a bed of roses! The next thing he was ordered to do was to toss me in a bin and spray me with chemicals. Yuck! That's not the kind of shower I was hoping for on a Thursday morning!"

I was told the chemicals would keep me fresh for the ride to Canada. Whatever! It only made me feel toxic and sticky. And that bin! That bin was crammed full of other grumpy tomatoes. I got an elbow in my rib and now I'm bruised all over.

Well, once we were crammed in that bin, they put us on a truck and we thumped all the way to a processing plant (throws him/herself around a little). At the plant, they dumped us out on a table and pushed us around. Some of my friends were taken away for being just a little small. The nerve! But not me! I got a sticker slapped on my face and was shoved into another box.

They put us on a second truck, one of those big-rig trucks; and we were off on our way here. Do you know how long it takes to drive from California to New York? WAY too long! The trip was exhausting. And boring! Just highway, highway, and more highway. Nothing but concrete and car fumes!

The worst part is that I made it all the way here to find out you already have tomatoes. You can grow them right outside your door! So I don't even know why I'm here. It just doesn't make sense! I'm going to rest over here in the corner and see if you can figure it out."

Adapted from: Where in the world does your food come from?
http://lifecyclesproject.ca/resources/downloads/Where_in_the_world.pdf

FOOD JUSTICE/ACCESS TALKING POINTS

The following highlights key food security, access, and sustainability issues as raised in the story. Guide discussion using these points.

Why is local food good?

Transportation and food miles The farther away something comes, the more fossil fuels are burned in the transport of that food.

Food quality and taste Local food is consumed right after harvest, so it is fresher and riper. Bananas, for example, are picked green and ripen in travel. Many tomatoes are picked green and sprayed with ethylene gas to make them ripen during travel. This results in “red” tomatoes without much taste.

Better farming practices Big farms generally grow a few special crops. Small-scale farmers grow more than one thing, so the loss of one crop may not have a terrible impact because other crops are still available. Also, farmers on a smaller scale farm can rotate what is grown in each plot, which keeps the soil healthier by alternating what nutrients are taken out and put back in. Farmers with animals can use manure as to nourish the soil.

Workers’ wages A major issue in industrial agriculture is the low wages workers (many of them immigrants) receive. Workers on industrial farms and those in the food-processing industry are often subject to hazardous working conditions and unfair labor management practices. Sustainable farmers often better understand that healthy and fair employment practices, such as paying fair wages, can yield better food and a stronger community.

Support local businesses Local food production protects small farms, local jobs and shops, and increases food security (less dependency on outside sources, enabling people to make more informed food decisions). In most communities that rely on produce coming from industrial farms, only 7% of local food dollars stay in the community; the other 93% pays the processors, packagers, distributors, truckers, all the things that work to increase our food miles.

Packaging Because food processors ship food far from the farm, they use lots of paper and plastic to keep food from spoiling. Think about all the plastic and polystyrene foam (Styrofoam™) packaging you see at a grocery or corner store. These materials are difficult or impossible to reuse or recycle. A local farmer can put produce in a bin or box and set it out on a table.

Local vs. sustainable Local food can address the environmental footprint and an item's nutritional value, but local is not always sustainable, which means that produce is grown in an environmentally and socially responsible manner. And that is the production of food, fiber, or other plant or animal products using farming techniques that protect the environment, public health, human communities, and animal welfare.

Source, and for additional details:

Grade Communications Foundation: Sustainable Agriculture: The Basics
<http://www.sustainabletable.org/246/sustainable-agriculture-the-basics>

How does growing fresh produce in a garden ensure that people have access to food?

Food security Basic food security provides people with the nutrition they need to be healthy and active. It means they don't have to struggle to find adequate, healthy, and supplies of food and that not all of their resources go to food.

Food insecurity This is the uncertainty of having or the inability to get enough food to meet the needs of all household members. People experience food insecurity because they don't have enough money to buy or access food access to resources to get food.

Source: Hunger in the United States: Middle and High School

<http://www.tolerance.org/supplement/hunger-united-states-middle-and-high-school>

What might make it difficult for people to not only have access to food, but also access to healthy food? What happens as a result?

- **Economic** Unemployment, high housing costs, low wages and poverty, rise in food prices
- **Food access** Distance from source of healthy food (i.e., supermarket), ease of access (cost, for example), distribution,
- **Impact of Food Insecurity** Hunger, poor health (i.e., obesity, diabetes), inability to afford balanced meals, people worried that food will run out before they have money to buy more, forced to skip meals because they can't afford food

Sources: Grace Communications Foundation: www.sustainable.org

Hunger and Food Security Lesson Plan: www.jhsph.edu

Doc 2: Compost

A. Standard Compost

What to compost (be sure to discuss the concept of what is bio-degradable in terms of what decomposes)

1. To promote the breakdown of organic materials, you need three things:
 - A good carbon/nitrogen ratio (4 parts carbon to 1 part nitrogen)
 - Sources of carbon (browns or dry, hard materials) are dry leaves, sawdust, shredded newspaper, hay, straw, and eggshells
 - Sources of nitrogen (greens or wet, soft materials) are manure, green plants, grass clippings, vegetable and fruit scraps, coffee grounds, and tea bags
2. Water, which you add whenever you add new dry materials to the pile
3. Microorganisms, introduced by adding a few shovelfuls of dirt to the pile

What not to compost

1. Leftover cooked food (attracts animals, contains fats and oils that are slow to break down, and contains salt that is harmful to plants)
2. Meats (raw or cooked) and cheese (attract animals, contain fats and oils that are slow to break down, and contain salt that is harmful to plants)
3. Inorganic material like plastic or metal (it won't break down)
4. Cloth and glossy paper (they take too long to break down and contain chemicals that are harmful to plants)
5. Pet waste (it makes compost smell bad and can introduce disease)
6. Living weeds with roots (they may grow in your bin)

Compost is beneficial because it:

1. Naturally replenishes the soil of its organic elements (composting is a natural process that typically occurs in nature)
2. Adds nutrients to the soil that support healthy plant growth
3. Replaces synthetic fertilizers (this prevents the pollution of stormwater runoff with nitrogen and phosphorous)

4. Improves soil so that water penetrates more easily and stays in the soil longer, thus reducing frequent watering
5. Helps to protect soil from erosion, which means less sediment in run-off waters
6. Keeps lawn and kitchen waste from filling landfills

Source: From Garbage to Garden: It's Compost Time www4.ncsu.edu/.../lesson%20plan.doc

Decomposers

1. Without decomposers such as bacteria, fungi, worms, ants, beetles, and mites, decomposition would stop and resources, which sustain life, would be depleted. A seemingly endless variety of decomposers all serve different functions in the decomposition process.
2. Every compost pile has a food web.
3. There are many different animals that help break down organic materials into the rich soil helper we know as compost.
4. A compost pile and a worm bin have networks of different bugs. Bacteria do most of the work, even though they are invisible to the naked eye.
5. Other animals large enough to see, such as beetles, worms, centipedes, millipedes, and sow bugs, are also important decomposers.
6. Without decomposer, animals all life would stop because new plants would not have the necessary nutrients needed to grow.
7. Decomposers turn our garbage into plant food.

Source: Do the Rot Thing
http://www.cvswmd.org/uploads/6/1/2/6/6126179/do_the_rot_thing_cvswmd1.pdf

B. Worm Composting

1. Worm composting is an excellent way to introduce living decomposers in the classroom. Active worm bins allow for the observation of the natural cycles of decomposition and gain new appreciation of earthworms as the “guts” of the soil.
2. Worms are incredible decomposers.
3. The worms we use for composting in boxes are surface feeders called manure worms, red wigglers, or red worms. Over 7,000 species of worms inhabit the world, and they are important to ecosystems.
4. Red worms have five pairs of hearts, no eyes and no teeth. They breathe through their skin, and need dark, moist surroundings.
5. Eight adult red worms can produce 1,500 offspring within six months, if conditions are favorable.
6. Each worm is both male and female and can eat over half of its weight in food every day.
7. Worms eat vegetative food scraps, turning them into a high quality fertilizer known as worm castings, which are nitrogen-rich fertilizer, can be returned to the earth, and are good for lawns, gardens, and houseplants.
8. The compostable matter that is thrown away—such as apple cores, melon rings, and soggy bread—are things that worms like to eat.

Source: Do the Rot Thing

http://www.cvswmd.org/uploads/6/1/2/6/6126179/do_the_rot_thing_cvswmd1.pdf

Some fun observation/garden checklist tasks that campers can do with worm composting:

1. Identify an adult worm, a baby worm, and an egg.
2. Do a “What do red worms like to eat more?” Experiment. Place two foods in the bin and see what they eat first.
3. Conduct a worm head count or worm census. Pull out ¼ of the bedding in the worm bin and count each earthworm that you find. Then multiply by four to estimate how many worms you have total.
4. Measure the length and weight of one worm
5. Time the worms to see how fast they eat. Add some type of veggie food waste and then see how long it takes your worms to consume it. Do this experiment again after your worm population changes.
6. Use the worm compost to grow some vegetables in a garden.
7. Use the worm compost on some plants and none on others to see the difference it makes.

Source: Worm Composting Activities for Kids

<http://www.wormcompostinghq.com/caring-for-worms/worm-composting-for-kids/>