

Activity: Composting Case Studies

Topics:

- Best composting practices
- Compost troubleshooting
- Problem-solving

Teacher's Guide:

Activity Overview:

In this activity, students will follow the story of a young composter and their compost pile. Some of these composters have had some trouble with their compost piles. In pairs, students will identify where they may have gone wrong in their composting process and use their knowledge about best composting practices to solve their composting challenges.

Learning Outcomes:

Students will be able to identify common challenges in the composting process. Students will be able to develop solutions for common composting issues. Students will understand the importance of maintaining optimal conditions in a compost pile

Pre Required Topics/Knowledge:

- General understanding of the composting process
- Compost recipe

Instructions:

1. Divide students into pairs.
2. Allow each student to read their assigned case studies individually.
3. Have each student answer the guiding questions with their partner.
4. Assign a case study to each pair to present back to the class.

Note: This activity complements the *How to Monitor a Compost Pile* activity in *The Practice of Composting* module. It is recommended that this activity be done after the monitoring activity. However, it can also be completed on its own.





Materials List:

- Case studies
- Activity sheet
- Packet of resources (Refer to *Materials for Printing* section)

Materials for Printing:

Resources:

Suggestion: Create a packet for students to take home.

1.  1 Bin Compost System Overview - English.pdf
 - a. *Source:* Central Valley Community Composting Collaborative
2.  ILSR-Composting-101-Training-Guide.pdf
 - a. *Source:* Institute for Local Self-Reliance
3.  Browns and Greens.pdf
 - a. Graphic with a list of Feedstocks
4.  Compost Glossary - English.pdf

Case Studies:

Suggestion: Replace the current names with the names of your students!

→ Scenario 1: The compost pile is dry and unproductive

- ◆ **Problem:** Not enough water added
- ◆ **Solutions:** Add more water, add more green material

Scenario #1

Addison earns money by mowing her neighbor's lawns on the weekend. She read online that yard clippings can be composted so she decides to start a pile with a wheelbarrow of grass clippings. Compost piles should have a green-to-brown ratio of 1:2, so she adds shredded newspapers and dried-up leaves. During the first week of her composting process, she adds 5 gallons of water. She turns the pile twice a week to promote airflow. In the second week, Addison has to study for her biology exam and does not have time to add water to her compost pile. She does manage to turn her pile twice a week. In week 3, she notices that her pile is very dry and adds 10 gallons of water. Addison goes on a family vacation for three weeks. Before she leaves, she puts her friend Xander in charge of maintaining her pile and only asks him to water it once a week because it is still very wet. Xander knows nothing about compost; even though he notices the pile drying up, he doesn't think to water more.

→ Scenario 2: Rotten Odor

- ◆ **Problems:** Too much green material, not enough brown material
- ◆ **Solutions:** Add brown material, increase aeration, use a cover

Scenario #2

David loves cooking and often generates a lot of vegetable scraps. He decides to start composting and adds his kitchen scraps, including vegetable skins and fruit rinds, to his compost bin. To balance out the green materials, he also adds some shredded newspaper and dry leaves from his backyard. During the first two weeks, he adds his kitchen scraps and yard waste daily. In the second week, David hosts a big birthday party with over 50 guests. Excited to involve his friends in his composting project, David encourages everyone to dispose of any fruit or vegetable scraps in his compost pile. The party is a great success and he ends up with an overwhelming amount of kitchen scraps in his pile. However, amidst the fun of opening birthday gifts and spending time with his friends, he forgets to add more brown material to balance the sudden influx of green material. By the end of the week, his compost pile becomes very smelly and attracts flies.

→ Scenario 3: Slow decomposition

- ◆ **Problem:** Not enough oxygen
- ◆ **Solutions:** Turn the pile to aerate

Scenario #3

Carlo loves to garden in his backyard. He decided to start a compost pile so he could improve the health of his soil to grow his own vegetables. He gathers a mix of grass clippings from his weekly mowing, vegetable scraps from his kitchen, and wood chips from a recent tree trimming. Carlo carefully layers his feedstocks in an unshaded area of his backyard. Carlo reads that he has to keep his compost pile moist for the microorganisms responsible for breaking down feedstocks to be able to move through the compost pile. He waters the pile regularly to keep it moist but does not turn it. After a month, Carlo realizes the pile looks very dense but the feedstocks are not breaking down as expected. The greens and browns look the same as they did when he put material in his compost pile.

→ Scenario 4: Unbalanced pile

- ◆ **Problems:** Incorrect green-to-brown ratio and insufficient turning
- ◆ **Solutions:** Aerate the pile by turning more frequently and add more brown material

Scenario #4

Selah learns about composting during an Earth Day event at school and decides to start a compost pile in her backyard. She gathers materials including grass clippings, vegetable peels, and coffee grounds to start her compost pile. Wanting to ensure her pile had enough brown material, she added shredded newspaper, dry leaves, and cut-up cardboard. She carefully measures each feedstock to ensure she sticks to the ideal composting ratio of 1 part green to 2 parts brown. During the first week, Selah adds material and water to her pile every few days making sure that it feels like a wrung-out sponge. However, Selah joins the swim team and has no time to turn her pile after school. She does not turn her pile for the first two weeks. She notices that her pile is getting smaller and assumes that the material is starting to break down and proceeds to add more material on top. In the third week, Selah notices a strong odor coming from her compost pile and decides to investigate. As she digs into the pile, she notices that the inner layers are slimy and wet but the outer layers are dry and have not broken down. The smell becomes stronger the deeper she digs.

→ Scenario 5: Exposed food scraps

- ◆ **Problem:** Too many exposed food scraps lead to pests
- ◆ **Solutions:** Layer feedstocks and cover any exposed food

Scenario #5

Lily volunteers at her community garden. During the summer months, they grow a lot of tomatoes. Her neighbors stop by to take some home but there is still a wheelbarrow full of tomatoes. They begin to go bad, so Lily decides to start a compost pile in the garden so they do not end up in the landfill. She reads an article about how to start a compost pile and realizes she needs to add brown material to her pile as well. She decided to add a wheelbarrow of fresh garden clippings and straw at the base of her pile. She adds the rotting tomatoes to the top of her compost pile and adds some water. She turns her pile leaving the tomatoes exposed. After a couple of days, Lily hears soft chewing noises coming from her compost pile. When she gets closer, she notices little mice eating the tomatoes!

Composting Case Studies Activity Sheet

In this activity, you will read different composting scenarios, identify the problems, and brainstorm solutions. Use the guiding questions below to help analyze each scenario and identify ways to improve the composting process.

Scenario # _____

Summary

1. What materials were used in the student's compost pile? Identify whether they are a carbon (browns) or nitrogen (greens) source.

Identify the Problem

2. What issue is occurring in the compost pile?

3. What signs indicate that a problem was occurring?

Determine the Cause

4. What actions, or inactions, may have led to the problem?

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