



TAKE CARE OF TEXAS: EDUCATOR MATERIALS

LESSON PLAN

Create Your Own Compost

Objectives:

Students will learn what composting is, the ingredients for a successful compost pile, and the environmental and societal benefits it provides.

Prerequisites:

- Before starting the lesson, set up the compost container in an approved area on campus. Avoid placing the container on concrete or paved surfaces, near wooden fences or buildings, or in highly trafficked areas. Be aware that if placed in direct sunlight, the compost pile will require water more often but may compost faster.

Note: It may take several days to gather enough materials to initiate the composting process.

Duration:

45 minutes

Materials:

For Introduction:

- Compost Sort Challenge page (per student or small group)
- How to Compost in our Backyard video
 - <https://www.youtube.com/watch?v=-d-SARq7GCQ>
- Guide to Yard Care
 - <https://takecareoftexas.org/resources/guide-yard-care>

For Composting:

- Gloves (one pair per student)
- Yard stick or shovel
- Source of water
- Bags or reusable containers to collect “green” and “brown” materials
- Large container, bin, or chicken wire to create your own compost container (at least 3 feet wide and 3 feet tall).
- Brown material (dried leaves, wood chips, dried grass clippings, paper, pine needles, or other plant material)
- Green material (fresh grass clippings, flowers, fruit and peels, tea bags, vegetables and peels, coffee grinds)



Note: Do not compost animal bones, animal meat, fats such as animal fats or cooking oils, cat litter, coal, charcoal, colored paper, dairy products, diseased plants, pet droppings, insecticides, pesticides, weeds, or toxic chemicals.



LP18 (8/25)

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Introduction:

TEACHER BACKGROUND INFORMATION:

Composting is the natural process of turning organic matter (such as leaves) into nutrient-rich soil. This process requires “decomposers” which are organisms (microorganisms and/or macroorganisms) that break down organic matter. In just a few steps, you can create your own compost at home or school.

Composting has many benefits, including:

- **You use less landfill space** by reusing your organic materials instead of sending them to a landfill.
- **Plants receive nutrients slowly** unlike chemical fertilizers, which could damage your plants if applied incorrectly.
- **Organic matter in soil increases** because compost improves vitamin and nutrient content in food grown in compost-rich soils.
- **Soil retains more moisture** as a layer of compost on top of your soil reduces the amount of moisture that evaporates.
- **Saves money** since you are using your waste to make compost, it’s practically free! And when you use it, you don’t have to buy as much garden soil or water as much.

The four main components in the composting process are decomposers, water, oxygen, and organic matter. Just like us, decomposers need water and organic matter to survive. When they “eat” organic matter, decomposers release heat and certain molecules that plants can use as nutrients. They also release carbon dioxide; however, they might release other molecules that smell like rotten eggs if there isn’t enough oxygen in the compost pile for them to “breathe.”

There are two main types of organic matter for composting: “brown materials” and “green materials” (see the materials section for examples of each). Along with an adequate supply of oxygen, sufficient water, and a good balance of brown materials and green materials, you can create an ideal environment for decomposers and create ready-to-use compost in one to three months. Composting can take longer depending on the technique used, seasonal temperatures, moisture levels, and the ratio of brown to green materials. Regardless, the compost is ready-to-use when it is dark brown or black, crumbly, and has an Earth-like aroma.

Tips for composting in 1-3 months:

- The best composting temperature is reached when the pile is at least 3 feet tall.
- Break the materials into smaller pieces to help speed up the composting process.
- Maintain dampness—moisture of the pile should be similar to that of a wrung-out sponge.
- Mix the materials frequently to maintain oxygen throughout the pile.
- Maintain equal amounts (by weight) of green and brown materials.
- Make cuts in stems and leaves to provide entry for microorganisms.



Introduction Activity:

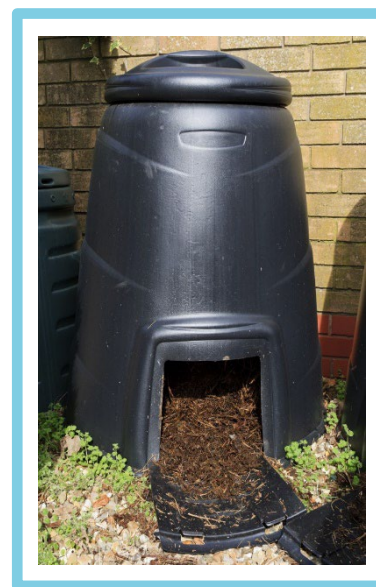
1. Ask your students what they think happens when leaves, fruits, or branches fall on the ground. Explain to students that those things naturally decompose because of decomposers. The decomposed materials can then be used to help trees, shrubs, and other plants grow.
2. Pass out the **Compost Sort Challenge words** and explain that students either individually or as a small group will sort these materials into 3 categories- compost, recycling, and trash. As students sort, monitor and pose the question: *Are there materials that can be put into multiple categories and why?*
3. Review the sorts with students and discuss their answer to the question posed during the sort. See below for correct answers to the sort.
 - **Compost:** Banana peel, eggshell, grass clippings.
 - **Recycling:** Plastic bottle, glass.
 - **Trash:** Greasy Box, meat scraps.
 - **Both (composting and recycling):** Newspaper, Cardboard.
4. Show students [Take Care of Texas How to Compost in Your Backyard video](#). Afterwards, ask the following questions to assess understanding.
 - a. What is composting?
 - b. Why is aeration important in composting?
 - c. What is the role of microorganisms in composting?
5. Show students the [Guide to Yard Care](#), pgs. 7-9, and explain if they would like to learn more they can read through those pages.

Procedure:

1. Explain students will be working on creating their own compost pile at school. Discuss safety procedures for using gloves, tools and checking the pile for animals before working.
2. As a class, collect enough brown material outside to completely fill the container. Store extra materials.
3. Assign students to do the following each day until the compost pile is 3 feet tall:
 - a. Throw any green material (from their lunches) into the container.
 - b. Cover greens with browns and maintain an equal ratio of materials.
4. As soon as the compost pile is 1 foot tall, add water to the pile and mix the materials with a stick or shovel to ensure uniform dampness and aeration.
5. Now that students have seen how much water to add and how to mix the pile, assign as a task. This task will need to be done routinely for the next 1 to 3 months until the compost is ready for use. *Remind your students to check the pile before watering it to determine how much water (if any) to add.*
6. Adjust the watering schedule to maintain appropriate dampness, like a wrung-out sponge, throughout the pile.
7. Mix the materials every few times scraps are added or when the pile looks matted.
8. Use the compost in a school garden, for a class activity to pot small plants, or separate equally into gallon-sized bags and give to students to take home for potting plants or landscape.

Some things to note:

- If your compost pile ever has fruit flies or has an odor, add brown material and mix.
- The pile will decrease in volume by 35-50% in a week or so. If desired, you can continue to add more browns and greens to it; however, you will need to sift/remove un-composted greens from the pile before using it.
- If you get a lot of rain in your area, you may need to cover your composting bin. Too much water can slow down the process and make it slimy.



- Compost will break down faster once the pile has equal amounts of green and brown materials and the pile is at least 3 feet tall in the container.

Glossary:

- **Compost** – a mixture of various decayed organic matter that is used for soil enriching and conditioning
- **Composting** – natural process of decomposition and recycling of organic material into a humus-rich soil
- **Organic** – derived from living matter
- **Decomposers** – animals, bacteria, and fungi that break down organic matter
- **Carbon-rich (Browns)** – a substance, material, or environment that contains a high concentration of carbon
- **Nitrogen-rich (Greens)** – contains a high proportion of nitrogen, an essential element for plant growth and the synthesis of organic compounds like proteins
- **Aeration** – introduction of air into material
- **Nutrient** – any molecule that an organism may need to grow, reproduce, and maintain health
- **Biodegradable** – waste material that is capable of being broken down by decomposers
- **Microorganisms** – microscopic organisms such as bacteria and fungi

Applicable TEKS:

- **4th Grade** – §112.15.b. 1A-E; 2B; 3B-C; 5A,B; 12A-B
- **5th Grade** – §112.16.b. 1A-E; 2B; 3B-C; 5A,B; 11; 12A-C.
- **6th Grade** – §112.18.b. 1A-D; 3B-C; 5A,B; 12A.
- **7th Grade** – §112.19.b. 1A-D; 3B-C; 5A,B; 12B.
- **8th Grade** – §112.20.b. 1A-D; 3B-C; 5A,B; 12C.

References:

- Take Care of Texas – **Guide to Yard Care**. <https://takecareoftexas.org/resources/guide-yard-care>
- Take Care of Texas – **Compost Recipe**. <https://takecareoftexas.org/resources/create-your-own-compost-0>
- Take Care of Texas – **How to Start Composting in Your Own Backyard**. <https://www.youtube.com/watch?v=-d-SARg7GCQ&t=4s>

For more teacher background information use the following references:

- Environmental Protection Agency – **Composting at Home**. www.epa.gov/recycle/composting-home
- Texas A&M AgriLife Extension – **Don't Bag It, Compost It**. aggie-horticulture.tamu.edu/earthkind/landscape/dont-bag-it/

Note: Some of these references are from external sources and may not reflect the views of the TCEQ. Before using a reference, please verify that it is appropriate for your students.

Supplement Material:

COMPOST SORT CHALLENGE

COMPOST

NEWSPAPER

GREASY
BOX

RECYCLING

EGGSHELL

CARDBOARD

TRASH

MEAT
SCRAPS

BANANA
PEEL

GRASS
CLIPPINGS

PLASTIC
BOTTLE

GLASS