

# Making Compost

## Lesson Description

In this lesson, students understand the concepts of decomposition and compost. They make compost columns so that they can watch change over time as materials go from their original state to compost. They learn about conducting experiments by changing variables in each compost column to see what the impact is on the compost.

- Time required: 60 minutes
- Location of lesson: Classroom or garden

## Learning Objectives

- Understand the concepts of decomposition and composting.
- Identify materials needed to make compost.
- Describe the impact of different variables in scientific experiments.

## Materials and Preparation

- Rotten fruit or vegetable – 1 to show the class
- Fresh fruit or vegetable (same type as the rotted one) – 1 to show the class
- Empty and clean 2-liter plastic soda bottles – 6 per class to make 3 compost columns (2 bottles are needed for each column)
  - Prior to class, cut the bottles and assemble them as directed in the instructions in the workbook
- Cheesecloth – 3 squares (1 for each compost column)
- Rubber bands – 3 (1 for each compost column)
- Scissors – 1 pair sharp enough to cut the soda bottles
- Thermometer – 3 (1 for each compost column)
- “Browns” and “greens” for the compost columns – enough to fill 3 columns
  - Browns: dry/dead leaves, top soil, straw, paper, cardboard, wood chips or ashes
  - Greens: vegetable scraps and peels (no animal materials such as meat, bones, fat), coffee grounds, green/alive leaves, plants and plant cuttings, grass clippings
-  **Making a Compost Column**
-  **Pictures of Compost** – printed out
-  **Do the Rot Thing** – printed out
- Prepared vegetable snack of the week – 1 for each student
- Water to drink during the Class Warm-up – water dispenser in the classroom and 1 cup or a water bottle for each student

### Class Warm-up: Champion Cheer and Veggie Taste Test (5-10 minutes)

- Give each student a cup of water or ensure that they have a filled water bottle in front of them.
- Give each student the prepared veggie snack of the day.
- Lead the students in enthusiastically reciting the  **Champion Cheer**.
- At the end of the cheer, drink water and eat the veggie snack together.
- Have students complete their  **Taste Test Observations** about the vegetable snack of the week.

### Review of Last Lesson (2-3 minutes)

- Review the evaluation questions from last week's lesson. Evaluation questions from all lessons are listed at the end of the workbook .

### Class Discussion (10 minutes)

Write the word 'compost' on the board. *Who has heard of the word compost? What is compost?* (A mixture of decomposed items that is used to help our soil). *Compost comes from a natural process of decay (or rotting) and re-birth. It is nature's way of recycling.*

*How do we use compost in our garden?* (We add it to our garden soil to make it healthier)

*Here are some pictures of compost.* Show students the  **Pictures of Compost** teacher resource. If you have a compost pile in your school garden, refer to that during this discussion.

*We said that compost is a mixture of decomposed items.* Write the word 'decompose' on the board. *What does decompose mean?* (Answer: to break down and decay, or rot). *What kinds of things can decompose?* (some examples - food waste, paper scraps and yard waste). *What kinds of things do NOT decompose?* (some examples - metal, glass, plastic)

Show the students the piece of fresh fruit or vegetable. Then show them the piece of rotten fruit or vegetable.

*What is the difference between these pieces of fruit/vegetable? Which one is rotting or decomposing?*

*What has happened to the rotting piece? How does it look different from the fresh piece?*

*What is causing it to rot or decompose?* (Answer: air, moisture, light, temperature) Write these words on the board: air, moisture, light, temperature.

*This rotten food is an example of food decomposing. This happens to all of our food waste over time. After food gets rotten, there are still nutrients in the food that can help our soil. Our food can go back into the soil to make it healthier! Let's look again at pictures of compost.* Show the  **Pictures of**

**Compost**, and refer to the compost pile in the school garden if you have one. *This rotten food can go into a compost pile so that it can be put back in our garden soil to make it healthier.*

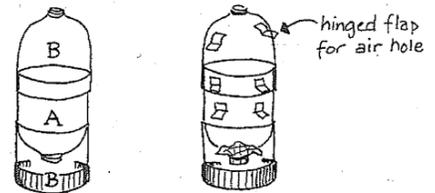
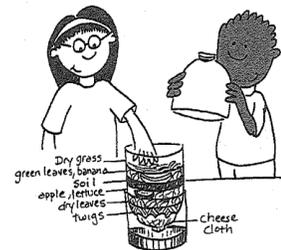
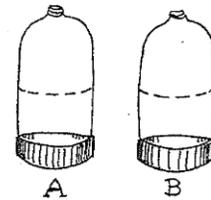
*Today we are going to be making our own compost and we'll watch it change and break down over the next few weeks.*

**Activity (40 minutes)**

-   **“Making a Compost Column”**: Students make compost columns and monitor them over time to see how the compost changes and breaks down. They change a variable in each column to see the impact of that variable on the compost.
  1. Prior to the class, make 3 compost columns (unfilled) following steps 1-3 that are listed in the workbook  **Making a Compost Column**.

Supplies needed: 2 empty, clean 2-liter plastic soda bottles; 1 square of cheesecloth, 1 rubber band

1. Cut the bottom off bottle A. Cut bottle B in half. Set aside the top half of bottle B.
2. Fasten the cheesecloth over the top of bottle A with the rubber band.
3. Turn the top part of bottle A upside down. Put it in the bottom half of bottle B, so that it hangs upside down. Now the compost column is ready to fill!
4. Use the top half of bottle B to cover your compost column after you fill it.
5. Cut hinged flaps for air.



2. Direct students to the workbook pages  **Making a Compost Column**. Show them the 3 unfilled columns that you’ve made, following steps 1-3 in the workbook.
3. *Now we will fill each column to make compost. How would you design a compost column that will decompose ingredients as quickly as possible? What would you put in the compost column?*
4. *Compost usually includes layers of “green” and “brown” ingredients.*

- a. *Greens are fresh or live ingredients: vegetable scraps and peels (no animal materials such as meat, bones, fat), coffee grounds, green/alive leaves, plants and plant cuttings, grass clippings*
  - b. *Browns are dry/dead ingredients: dry/dead leaves, top soil, straw, paper, cardboard, wood chips or ashes*
5. *We layer compost like a layer cake (green/brown/green/brown, etc.). Brown materials always go on top.*
6. Show the teacher resource  **Do the Rot Thing** for a visual of the greens and browns within compost.
7. Show the students the “greens” and “browns” that you brought to fill the compost columns.
8. *What can we do that will help the compost decompose?*
  - a. *Does air help? (yes)*
  - b. *Does moisture help? (yes)*
  - c. *Is there anything we can add? (soil)*
9. Divide the class into three groups so they can each fill one compost column.
10. *Each of our columns will have the same ingredients in the same order (greens, browns, greens, browns, etc.), however we are each going to choose one variable to change in each column so we can see the impact on the compost. A variable is something that we change in an experiment while everything else stays the same.*
  - a. *One column will have air holes and soil but no moisture.*
  - b. *One will have soil and moisture but no air holes.*
  - c. *One will have moisture and air holes but no soil.*
11. Have each group choose one variable that they will test in their column: either no air, no moisture or no soil.
12. Have students fill each column using greens and browns, plus soil, moisture and/or air holes depending on which variable they are testing.
13. If you have the time and supplies to make a fourth column, make one that has air, moisture and soil in it. This would be the control column.
14. Have students record their compost “recipe” in their workbook  **Making a Compost Column**. Have them note their variable.
15. Give each group a thermometer to record the temperature of their column and note this in their workbook  **Making a Compost Column**.
16. *Let’s think about what will happen to our compost over the next few weeks.*
  - a. *How do you think your column will look in 2 weeks?*
  - b. *How will it look in 4 months?*
  - c. *Which things will decompose the fastest? Why?*
  - d. *What purpose do you think air and water play in helping things decompose?*
  - e. *What about worms – can we add those to compost?*

f. *What do you think causes decomposition?*

17. Put the compost columns in a place where they will be undisturbed but still accessible over the next few weeks. Make sure they are each getting equal amounts of direct sunlight and are sitting at the same temperature. Both light and temperature will impact the process of decomposition.
18. Have students observe their compost columns once a week and note their observations in their workbooks .

**Evaluation Questions (5 minutes)**

1. *What does decompose mean?* (Answer: break down or rot)
2. *What is compost?* (Answer: a mixture of decomposed items that is used to help our soil)
3. *What types of things should you put in a composting pile?* (Answer: “browns” – dry/dead leaves, top soil, straw, paper, cardboard, wood chips or ashes; “greens” – vegetable scraps and peels, coffee grounds, green/alive leaves, plants and plant cuttings, grass clippings)
4. *What three things does a composting pile need to grow?* (Answer: moisture, air, soil)
5. *How much water should you drink every day?* (Answer: at least 6 cups of water a day)
6. *How many fruits and vegetables should you eat every day?* (Answer: at least 5 fruits and vegetables a day)
7. *Does gardening connect you to your culture and help you learn new words in your language?* (Answer: yes)

**Preparation for Future Lessons – Reminder for the Instructor**

- Review the materials and preparation needed for the next lesson.
- Remember that an Elder guest instructor is needed for these Spring lessons: lesson 1 (Eating A Rainbow), lesson 4 (The Water Cycle), and lesson 9 (Plant Parts: Pollination).

**Notes**

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