

B5.3 Recycling organic waste

Just try to imagine this: Over one trillion (that's a 1 with 12 zeroes!) living organisms inhabit a piece of ground measuring 1 square meter across and 30 centimeters deep. That's an incredibly large number! A great deal of these living organisms must be extremely small, so small that you cannot see them.

Of course, you can immediately recognize the larger ones, for example, earthworms. What do these living organisms do in the ground? They feed on organic waste and produce humus, a type of soil that contains a lot of minerals. Plants grow particularly well on this humus.



Figure 1: Compost pile.



Find out how fertile soil is produced in a compost pile.



Write down your ideas and guesses:

You need the following for the experiment:

- ☐ 1 compost container (without a bottom and with air holes or slits on the sides)
- ☐ 1 container with lid, 100 ml
- ☐ gloves
- ☐ 1 magnifying glass
- ☐ 1 trowel
- ☐ various kinds of yard and kitchen waste



Figure 2: Required materials.

**How to set up the experiment:**

Lay out all the materials as shown in the photo.

**How to conduct the experiment:**

Have your teacher show you a suitable place where you can create your own compost pile. It must be set up in a partially shaded location protected from the wind. It should not be exposed to direct sunlight. In addition, it should be located a short distance away from your and your neighbors' houses because it might smell a little. It must also be open to the ground below so that living organisms can migrate upward.

1. Set up your compost container and start filling it: It is important that you alternate dry and moist materials and leave room for air in between. Each layer can be about 10 centimeters thick.
 - First layer (dry): small branches (maximum 20 centimeters long)
 - Second layer (moist): soil or finished compost (a few handfuls)
 - Third layer (dry): branches, twigs, brushwood
 - Fourth layer (moist): grass, leaves, kitchen waste (cut as small as possible)The teacher will give you a list of waste that is suitable for a compost pile.
2. Add a new layer every week. It should be created like the fourth layer.
Tip: Earthworms especially like coffee grounds and onion skins.
3. If you observe that the organic waste starts to stink or that all layers look almost unchanged for many days, this means that the decomposition has not started correctly. You can help the process by aerating the compost pile. This allows air to reach the lowest layers.
You can aerate the pile by digging in the waste with a trowel. Wear garden gloves when you do this. You can mix in compost soil during this activity to support decomposition. Be careful that you don't injure the earthworms and other small organisms!
4. Observe the compost pile for three months. Once a week, spend ten minutes looking at the compost pile. If the compost container has a window, you can also look inside. Use the trowel to take a sample, put it in the container, and look at it with the magnifying glass.

**Write down your observations:**

Keep a log of all observations, such as changes in size, shape, and appearance of the soil and waste. Also write down when you discover living organisms.

Week, date	Appearance of the waste/new soil (size, shape, decomposition)	Discovered organisms
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		

**Evaluate your observations:**

1. Summarize your observations over the three months and write down your summary.

2. Indicate the kind of waste that decomposed rather quickly. What kind of waste took a particularly long time to decompose?

Fast: _____

Slow: _____

3. Describe how the overall appearance of the compost pile changed.

**Doing further research:**

Does it make a difference whether the waste is whole or chopped when you toss it on the compost pile? Find out!

1. Place the next organic waste, for example, two apple cores, on the compost pile as follows:
 - Place one whole core on top.
 - Chop one core into small pieces beforehand.
2. Now observe whether it makes a difference in the decomposition process.
3. Write down your observations. Do you have an idea of why this could be?



What is your opinion?

Your classmate Paul's birthday is today. His mother gave him small bags of gummy bears for his classmates. He collects all the "trash" in one bag. After recess, you watch as Paul throws the whole bag into the organic waste bin.

Think about it: What would you do?
