

RAFT IDEAS

Topics: Environments,
Natural Resources,
Microbes, Data Collection
and Analysis

Materials List

- ✓ 2 or more bulk CD containers
- ✓ Test samples (e.g.- plant pieces, non-meat food scraps, packaging materials)
- ✓ Masking tape or adhesive labels
- ✓ Plastic bag (storage-sized) or equal
- ✓ Lab notebook for data collection
- ✓ Optional: hand lens and/or microscope

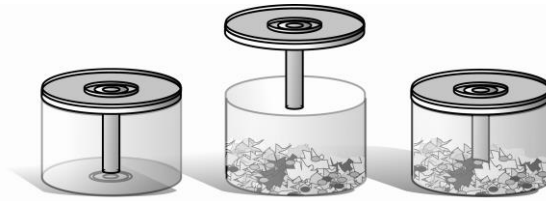
This activity can be used to teach:

- Cycles of matter and energy (Next Generation Science Standards: Grade 5, Life Science 2-1; Middle School, Life Science 2-3)
- Ecosystems and populations (Next Generation Science Standards: Middle School, Life Science 2-1)
- Science & Engineering Practices (Next Generation Science Standards: Grades 4-12)



Let it ROT

Exploring Nature's Recycling Team



Students can observe how natural and man-made materials break down and decompose by experimenting with different materials and environmental variables.

To Do and Notice

1. Place test samples into pairs of bulk CD containers to test for decomposition. Each experimental pair should contain the same type and size of sample material.
2. Decide on the variable to test for each pair. For example, one sample could contain added water while the second sample remains dry. Excellent variables to test include: light, temperature, added moisture, and added disinfectant.
3. Label the containers as to the original contents and test variable (light, moisture) by writing on masking tape or adhesive labels.
4. Make observations and notations every day for at least 7 – 10 days. Look for dark, fuzzy-looking circles on the surface of the samples. These circles are a type of fungi called molds, multi-cellular organisms that grow from spores.
5. Take careful notes of the changes observed each day. Include variations in color, number of mold colonies, and the appearance of the surfaces (e.g., smooth, fuzzy, bumpy, deflated).
6. At the end of the experiment, place each bulk container into a plastic storage bag, close, and throw the bag away. **Do not open the containers!**

The Science Behind the Activity

All living and non-living components of an environment are interconnected. Plant varieties, animal populations, rock types and sizes, water levels, and microbial life all contribute to a healthy and thriving ecosystem. Organic matter decomposes over time; materials are broken down, “recycled” and re-used by other parts of the environment. Decomposers (including molds and other fungi, bacteria and insects) feed on the non-living organic material. The time required to decompose any given item depends on environmental factors such as temperature, moisture, and the local population of decomposers.

Microbes were the first life on planet Earth (first appearing as early as 3.8 billion years ago); they or their spores can survive in the harshest of environments. The combined microbial biomass outweighs the total animal biomass hands-down! Most microbes either help us or live in harmony with us, but some are harmful. Many microbes are actually used by humans, such as the yeasts that we use to make bread and beer, and the molds that make certain cheeses and antibiotics. Fungi were once thought to be plants. We now know fungi have more in common, genetically, with animals. Unlike plants, fungi do not use photosynthesis; but unlike animals, however, fungi absorb rather than ingest their carbohydrates.

Web Resources (Visit www.raft.net/raft-idea?isid=188 for more resources!)

Fun facts can be found at:

- <http://commtechlab.msu.edu/sites/dlc-me/zoo/>
- <http://www.ucmp.berkeley.edu/archaea/archaea.html>
- <http://www.microbeworld.org>