

RAFT IDEAS

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

Materials List

- ✓ 30 Zip-close plastic bags, small ~7.6 cm x 7.6 cm (3" x 3")
- ✓ 30 caps for samples
- ✓ Test samples (e.g. - Packaging scraps, waste food scraps)
- ✓ Adhesive Strip
- ✓ Zip-lock bag (storage-sized)
- ✓ Lab notebook for data collection
- ✓ Optional: hand lens and/or microscope

This activity can be used to teach:

Next Generation Science Standards:

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



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Breaking it Down

Exploring Decomposition



Image from microbeworld.org

Students explore how organic materials break down and decompose in this lab experiment that investigates materials, environmental factors, and variables.

To Do and Notice

1. Place pairs of small item samples into caps to test for decomposition. Each experimental pair should contain the same sample material.
2. Decide on the variable to test for each pair. For example, one sample can contain added water while the second sample remains dry. Excellent variables to test include: light, temperature, added moisture, and added disinfectant.
3. Place each cap with a sample inside a small baggie. Zip close the bag and secure the closure with an adhesive strip. (**Safety Note:** Once sealed, the bags should **NOT** be opened again!) Repeat steps 1 – 3 for each sample pair.
4. Label the adhesive strip with date, contents, and an identification number.
5. Place the plastic bag in an appropriate location. Make observations and notations every day for at least 7 – 10 days. Look for dark, fuzzy-looking circles on the sample surface. These circles are types of fungi called molds, multi-cellular organisms that grow from highly resistant spores.
6. Take careful notes of observed sample changes each day. Include variations in appeared texture, number of mold colonies, and overall appearance.
7. After experiment completion, place all the zip-lock samples into a zip-lock storage bag, close it, and throw it away. **DO NOT OPEN THE CULTURES!**

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 components of the environment. Decomposers, including insects, molds and fungi, and bacteria feed on the non-living organic material. The time required to decompose any given item depends on environmental factors, including temperature, moisture, and local population of decomposers. Microbes were the first life on planet Earth (first appearing as early as 3.8 billion years ago); they can survive in the harshest environments; and the microbial biomass outweighs the animal biomass hands-down! Most microbes either help us or live in harmony with us, but some are harmful. Many microbes actually help humans, such as yeasts that we use to make bread and beer and molds that we use to make antibiotics. Fungi were once mistaken as plants, but we now know that they are more closely related to animals.

Web Resources (Visit www.raft.net/raft-idea?isid=7 for more resources!)

Fun facts and information about microbes can be found at:

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

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