



Lesson: Composting In A Jar

Grade: K-3

Subject: Science, Arts
(extension)

Objectives:

Students will:

- examine how some wastes are recyclable through composting
- learn vocabulary words: decompose and composting

Teaching Time: 20-30 minutes; then variable observing and questioning time

Materials: Large clear plastic or glass jar (optional: one jar for each student); food scraps (fruit peels, bread), leaves, grass clippings, and soil (garden, NOT potting). Except for the soil, you might want students to collect these materials from home or the cafeteria; worksheet, Will I Compost?

(Optional:) magnifying lens;
Video: "Worm Bin Creatures Alive Through a Microscope" (see Teacher Resource section for availability)

REDUCE
REUSE
RECYCLE

Background:

Composting organic wastes is a natural process of aerobic decomposition, which allows nutrients in organic material to return to the soil and enrich it for plant growth in the future. Bacteria, fungus, and worms all help in the composting process. In the presence of air and moisture, these organisms decompose plants, releasing energy in the form of heat. (Prerequisite: "Cycles in Nature.") Vermicomposting is a special form of composting in which Red Wiggler worms are used to break down food waste into organic material that can be returned to the soil.

Composting is an excellent way of "recycling" organic waste at homes and at schools in order to keep this valuable carbon-rich material from entering the landfill where it can no longer be utilized by nature. In fact, organic material entering a landfill will gradually break down, but under anaerobic conditions, which causes a by-product of methane gas to be formed. Methane is a gas known to contribute to global warming and is a problem at landfills because it can cause fires and explosions. Thus, keeping organics out of our wastestream is not only beneficial to the environment, it also makes landfills much easier and safer to manage.

Procedures:

- **Do you know what happens to the leaves that are on the ground in the fall? Where do they go next summer?** Make the connection that a tree's leaves fall on the ground, decay into the soil, and nourish the tree by making the soil richer. Thus helping the tree to grow and make more leaves. **This is called decomposition.**
- **When people help food and natural materials decompose, this is called 'composting.' Composting is a natural way to recycle! Today, we are going to build a model of a compost pile that will help plants and food to decay or 'compost' into the soil.**
- (Optional: Assign students or teams to do this activity along with you as a model.) Place two inches of soil in the bottom of a clear or plastic jar. Moisten for best results. Place food, leaves, and grass scraps on top of the soil in several, repeating layers.
- Leave the jar open and place on a window sill or other location where it will not be disturbed. Observe the jar daily, noting any changes. WATER a little every week and stir contents to keep it slightly moist.
- On the second day-**What do you think is happening to the materials?** If the students don't mention it, introduce the word decompose again. **When items break down and rot they are decomposing.** Ask the students to theorize "how" the items break down. Write their theories on the board. Then explain how little bugs called "microorganisms" live in the soil and help break down natural materials.
- (Optional) Show the video "Worm Bin Creatures Alive Through a Microscope." See Resources section to obtain the video from DEQ.
- After a few weeks of observing the different items, show students the decomposition times using the transparency "When will these things Decompose?" in Lesson: Look at a Landfill.

Reflection/Response:

- Have students draw and record the results of the decomposing in a daily log for several weeks.
- Using one or more magnifying lenses, have students take turns looking at the compost and trying to find the small bugs that live in the soil. Ask the students to draw pictures of the microorganisms in their daily log.
- **Does anyone have a compost bin in their yard at home? What are the benefits of a backyard compost bin?** (Reduces waste going to the landfill or incinerator, provides nourishment for plants when we add it to the soil for home gardens.)
- Help students make the connection that natural items can usually decompose, while man-made objects such as steel or plastic cannot and have students complete the worksheet “Composting in a Jar”.

Extensions K-1:

- Use several jars, have students compare how different material decompose. Put food scraps, yard wastes, paper, plastic pieces, etc. in separate jars. Have students observe how these materials vary in the way they decompose.
- Sing “Banana Peel Blues” to the tune of “Take Me Out to the Ballgame” in the Lesson: Fun with Songs.

Reflection/Response (cont. for 2-3):

- Create a chart or graph illustrating the decomposition times of the items composted.
- Complete the worksheet “Composting in a Jar”.

Extensions 2-3:

- Develop a mural or class skit that shows demonstrates The 3 R's and its benefits.
- Draw a picture or tell a story about the new life of an apple core after it decomposes.
- Build a worm bin for your class or school and/or build a composting system for your school yard waste. (See reference materials for Vermicomposting and Composting in the Teacher Resource section).

Note: Materials in landfills take much longer to decompose (if they ever do!) because they are not exposed to air, water or sunlight, all of which aid decomposition. If we practice the 3 R's: Reduce our waste that we generate, Reuse everything we can, Recycle as much as possible and only throw things away as a last resort, fewer resources will enter our landfills and we'll help preserve our environment for many years to come!

Common Curriculum Goal:

Science: Unifying Concepts and Processes, Physical Science, Scientific Inquiry

- Apply comparison concepts of gradient, scale, symmetry, quantification, and invariance.
- Apply explanatory concepts of model, system, theory, probability, and replication.
- Understand chemical and physical changes
- Formulate and express scientific questions and hypotheses to be investigated.

Grade 3 Benchmark:

- Identify examples of change over time.
- Describe how some things change and some things remain the same.
- Describe changes that occur in matter.
- Ask questions about objects, organisms, and events that are based on observations and can be explored through simple investigations.



Worksheet: Will I Compost?

Student Name: _____

Draw a Circle around each picture that represents something that is natural such as plants and foods. These types of things can be "composted" or broken down and returned to the earth and are called "Organic".

Draw a Square around each picture that represents something that is artificial or made by people, also known as "Inorganic". These types of things cannot be composted, but sometimes they can be recycled. Put an "X" through the square of the objects that can be recycled.



