

# Let Worms Recycle Our Garbage

## **Summary:**

This project seeks to instill understanding of the concept of composting and provide actual hands-on experience in applying that knowledge for students and their teachers. An educator familiar with vermicomposting helps to install single worm bins and worms in individual classrooms and to guide each class in system maintenance, ending with harvest of vermicompost, castings, and worms at the end of the school year. An active worm bin is clean, odor-free, and takes up little space. Monthly feedback from the class to the facilitator provides a structure for solving problems with the systems.

## **Costs:**

No cost to participating schools is anticipated. The Solid Waste Institute provides a two-cubic-foot plastic worm bin, live redworms, and basic instructions as well as useful reference materials at the initial demonstration visit. The teacher and students supply old newspaper and organic food wastes for recycling. Free follow-up visits by the facilitator are available as requested.

## **Goals:**

1. Students and teachers directly involved gain an understanding of the process of composting as a form of recycling.
2. Students and teachers directly involved are introduced to an example of bioremediation: use of living organisms to improve soil quality.
3. Students examine solutions to larger environmental problems, in this case, recycling of a valuable resource (waste food) instead of disposing of it in a landfill.
4. Students use group decision-making and problem-solving skills in maintaining their working systems.

## **Indirect Benefits:**

1. Other interested people in the school system (other teachers, students in other classes, parents) are also exposed to the concept of composting.
2. If the teacher so chooses, many opportunities for study of worm biology, ecosystems, other compost organisms, and supplementary science experiments are easy to incorporate. Resources and suggestions are provided.
3. Final products can be used in school gardens or on class plants, building interest in outdoor classrooms.

**Background:**

Vermicomposting is the process of having redworms and other decomposer organisms process organic waste and turn it into a natural fertilizer. Classroom vermicomposting projects have been successful in Oklahoma, the United States, and internationally for more than ten years. Resources are abundant both in state (ODEQ, OSU Extension Service) and on the web.

**Detailed Description:**

An environmental educator from the Solid Waste Institute of Northeast Oklahoma, with experience in vermicomposting as well as familiarity with facilitating hands-on solid waste management activities in local classrooms, provides all equipment necessary to set up and maintain a single worm bin (2 cubic feet) into a classroom. During the initial visit, a single class period, the components of the system are introduced (bin, bedding, worms, food waste). Students shred newspaper for bedding as the process is discussed. After aerating and moistening the bedding, about 1/2 pound of worms is added. With the lid off and lights on, worms begin to disappear below the surface. Meanwhile, the class is examining adult worms, cocoons, and finished compost. A discussion of appropriate waste food items is initiated. By the end of the period, worms have disappeared and a selected student buries a small amount of food waste (banana peel) correctly. The lid is replaced and a maintenance/feeding schedule is decided on.

The teacher is left with a flyer of condensed instructions, a copy of the classic reference book Worms Eat My Garbage by Mary Appelhof, a handout on the broader concept of composting to send home, a list of references from both library and Internet, including a free interactive computer game "The Adventures of Vermi", and brief feedback forms to send in by phone, mail, or e-mail every month.

Once the worm bin is set up, minimal maintenance is required. The bin will remain clean and odor-free, as the worms process the food wastes. Students will gain direct appreciation of the recycling concept as garbage disappears and a useful product (worm castings) accumulates. There are opportunities for many simple additional experiments and for direct exploration of worm biology which can be included or not, depending on how the teacher chooses to use the resource.

The educator calls back after one week to help the class (through the teacher) fine-tune the system or answer class questions. After about 8-12 weeks, a follow-up visit is offered. During this class period, the students will do an initial harvest by hand-sorting worms (hands-on fun), find and learn about cocoons (worm reproduction), and view a video showing magnified images of other compost organisms at work in their bin.

Throughout the spring semester, the final product, vermicompost, will become available. It may be used for mini-experiments with classroom plants or in schoolyard or outdoor classroom flower beds.

[Click here for a list of foods that worms like.](#)