

Worm Composting for a School Garden

A San Leandro Service-Learning Project

Contact Information

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Introduction and Description of the Lesson

McKinley Elementary is an urban, K-5 school in the San Francisco Bay Area with approximately 500 students. Half of the students qualify for the federally subsidized lunch program.

The school administration worked with the Alameda County Office of Education's Service-Learning Waste Reduction Project (SLWRP) over the last two years to develop a waste reduction program for the school. Worm composting became an easy way to teach students that waste is in the eye of the beholder. The worms intrigued the students in the 2nd grade, as well as the notion that such small and slimy creatures can be so beneficial.

The students provided a service to the school community through reducing the school's waste stream and providing nutrient rich soil for the school's garden. Students learned the needs of the garden as they learned the needs of the worms and how composting supports both.

Instructional Process

Preparation

The students toured school garden and elicited from students that the garden needed a lot of care and brainstormed ways they have used/supported garden in past; identified worm composting as beneficial to the soil and resource conservation. The team of teachers involved in the SLWRP worked with other staff in the school community to identify areas of waste reduction and composting was among the activities recommended.

The teacher increased the knowledge of the students about worms through discussions at the onset of the project relating previous waste reduction and Cesar Chavez activities to this worm composting project, students' prior knowledge of gardening, composting and agriculture became the basis from which they added this new knowledge of worm composting. The teacher then gave them a concrete example of worms at work, by making mini-habitats using plastic jars. When presented the worm bin for the garden, the students devised a plan to care for the worms, including deciding how to collect the vegetable and fruit scraps at school, and later, the use of the compost, near year's end. (For food????)

Students play a role in sustaining an important process (worm composting) and help sustain an even larger process (the school garden), that provides the school community with a source of learning and beauty.

The teacher demonstrated to the students the tasks/skills that were required for the project before they began each activity

Issues and needs that must be addressed prior to the service

Recruit a volunteer, if possible; a high-school student worked with our class

Begin collecting the plastic jars with lids at the beginning of the school

Drill small air holes in the plastic lids before you begin student work

Best to do this lesson as a learning station with a volunteer to assist students

Cut black paper to a size that fits around exterior of jar in a ring that slides up and down

Set up worm measurement center with rulers and a balance scale. Students will use small metal washer for non-standard unit to measure weight of worms

Partner work will be necessary for worm-phobic students Respect individual's fears about creepy crawlies while encouraging exploration

California State Academic Content Standards

2nd Grade Science

Investigation and Experimentation 4b, 4d

2nd Grade Language Arts

Writing 2.1

Action

Visit school garden with class and ask students to recall observations made of soil sample

Explain the soil's need for nutrients

Ask students to think about a good use for worms in garden; expand on worm compost when mentioned

Introduce class worm bin to students

Discuss needs of worms (proper food, appropriate moisture, dark)

Brainstorm for ideas on how to decide who will care for worms and on what schedule

Write paragraphs explaining the garden's needs, the worms' needs and the role each student is willing to play

Share writing in small groups

Articulate, clarify and then implement the students' plans and then monitor ongoing process

Students were involved in assessing the need for worm composting at the school which ensured that this project was meeting an authentic need. Students prepared for the activity by brainstorming and discussing the benefits of worms to the soil, the needs of worms, and the ideas about caring for the worms.

Students addressed the Science standards through measuring the length and weight of worms students, and drawing pictures of the worm habitat and recording observations of the worms

made with magnifying glasses. Students addressed the Language Arts by writing paragraphs about the needs of the garden, worms and the role each student was willing to play.

Students identified the civic responsibility areas addressed in this lesson through class discussions of their roles in sustaining worm composting as an important process building soil and reducing waste and sustaining an even larger process – the school garden that provides our school community with a source of learning and service.

Students participated in the service during the school day both individually and in groups by
Examining soil samples from the garden and writing observations in learning log for project
Labelling lab sheet, as a whole group, identifying worm anatomy and adding to learning log

Placing an empty, clean soda can in the center of plastic jar (see Materials)

Spooning soil around the can, centering the can with soil filling the area around it

Misting the soil

Setting up worm measurement station where students measured and recorded length and weight and recorded on lab sheets

Adding worms carefully to soil in new habitat

Drawing a picture in learning log of worm habitat

Decorating one side of black paper with colored chalk, including students' name

Wrapping black paper around jar, design facing out; taping to form ring; adult assistance required

Adding a few compost-friendly food scraps to worm habitat

Recording observations, made with and without magnifying lenses, in learning logs

No supervision outside of regular supervision required during the school day.

Reflection

Students will reflect through student learning logs, during the preparation and action for the service, and through class discussion throughout the entire project.

Students will be asked to reflect upon a good use for worms in the garden, the needs of worms (proper food, appropriate moisture, dark), and the role each student is willing to play in the project.

Student Assessment

Students were assessed on their academic learning through lab sheets on worm anatomy and size, including length and weight, worm observations and their paragraphs on worm composting. Civic Responsibility Outcomes were assessed on how well they learned that they play a role in sustaining worm composting and their specific contributions to the service activity.

Project Evaluation and Expansion

The project was evaluated based on the successful outcome of the production of worm compost and the creation of a worm composting program at our school. The demands of a school garden are never-ending. The school garden needs active stewards and this project develops just that.

The project gave students a fun, exciting way to keep the garden as a focal point of their schooling. Collecting the vegetable and fruit scraps provided an ongoing practice for the students; it showed them that the leavings are not necessarily garbage.

This project could be expanded if students in my class trained students in other classes in the “how tos” of worm composting and if the teacher trained other teachers every classroom in the school could maintain a worm bin and integrate the garden into their curriculum.

Celebration and Public Recognition

This project was started at the beginning of the school year so that by late May, the compost could be sifted through and ceremoniously added to the soil around one or more special garden plants. We invited a few classes to the garden to watch and ask questions about the composting process. This gave students the opportunity to share informally, in a pleasant setting, about their year-long endeavor. Refreshments were a welcome addition and added a festive tone.

Materials and Staff Development Needs

Per student

Soil- 2 cups

Large, wide-mouthed plastic jar with lid (Grey Poupon or peanut butter are sold in plastic jars)

Soda pop can

Black construction paper

Colored chalk

Newspaper to protect work surface

2 earthworms – year: Red Wigglers are a small, lively worm, available at bait shops, that won't crowd the jar

Learning log (small booklet) in which to record at least 10 observations

For group

Tape

Drill (for adult use)

Spray mister

Magnifying lenses

Balance scale

Washers

Rulers

Large worm bin

Staff development in waste reduction was provided through the Alameda County Office of Education's SLWRP.

Funding and Resource Support/Sustainability

This project doesn't require much in the way of funding. Ten dollars covers cost of worms. Our class worm bin was made available through Alameda County Waste Management Authority but a class could create one from a large plastic tub w/holes poked into the lid and set on a large tray for drainage. Interest and commitment of class time on the part of the teacher were required to develop students' civic understanding and sustain the project.

Lesson Plan Profile

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Abstract

McKinley Elementary is an urban, K-5 school in the San Francisco Bay Area with approximately 500 students. As a teacher of primary students, I look for ways to develop their understanding of the connection between each individual's responsibility and community goals. Our school has worked with the Alameda County Office of Education's Service-Learning Waste Reduction Project (SLWRP) over the last two years to develop a waste reduction program for our site. This lesson gives second grade students the opportunity to enrich the school garden, both literally and figuratively, through worm composting. After students learn and apply skills that satisfy California State Academic Standards, through the study of worms, composting with the aid of worms allows garbage to become worm food. The students, in organizing themselves into worm care teams, take on the responsibility of providing an optimal habitat for the worms. Such responsibility is an important component of student development.

Degree of Complexity for Implementation

Medium

Educational Setting and Participant Information

Educational Institution

Public

Comprehensive Schools

K-3

Participant Configuration

Whole Class Project

School Schedule

Traditional 9 month

Kinds of Service Provided

Level of Service

Direct Service

Service Issue Area

Environment

Duration of Service Activity

Long Term (all year)

Specific Service Activity Areas

Environment

Recycling/Conservation

Lesson Content

Subject Area(s)

Reading/Language Arts

Science

California State Academic Content Standards

2nd Grade Science

Investigation and Experimentation 4b, 4d

2nd Grade Language Arts

Writing 2.1

Civic/Social/Personal Responsibility Standards

Students play a role in sustaining an important process (worm composting) and help sustain an even larger process (the school garden), that provides the school community with a source of learning and beauty.

Collaborating Partners

Educational Institutions

Elementary

Reflection

Journals

Oral Presentation