

## Composting Food Waste and Recycling in the Classroom

### Contact Information

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### Introduction and Description

This service-learning activity, a multi-modal, cross curriculum project, involves the collection and measure of waste on campus; mainly unsold cafeteria food and paper waste, group discussion and brainstorming on ways to improve the recycling and elimination of this waste, and the implementation of the project.

### Preparation

The students gathered in small groups to identify different problems on campus. The main problems the students identified: The school throws away 2-thirty gallon trash cans of unsold food every day. Two to three pounds of paper per classroom are tossed out each day. Every baseball season, trash increases on campus.

The students then proposed the collection of the waste on campus, develop different ways to recycle the collected waste, and distribute the recycled products throughout the community. The students display and inform the school and public about their lessons in pamphlets, posters, and journals.

### California State Academic Content Standards

- (7th Science 7c) Students compare similarities and differences in types of paper, including those made from recycled fibers, after they observe them with a magnifying lens
- (7th Science 7c) Students draw and write descriptions on how to make recycled paper and hypothesize the outcome.
- (7th Science 7b) Students Create original artwork for posters and fliers regarding the project and results. Information used before the project begins comes from data collected from various media sources
- (6th Science 7b: 7th Science 7a, 7d) Students will use various tools (rulers, calculators, etc.) to make the plans and scaled drawings for the bins. Students will construct the bins under close supervision
- (6th Science 6a) We must reuse and renew our resources. Natural resources are in limited supply. The worms and plants create a loop for recycling. Recycling paper, using it for mulch and seed cards creates a loop
- (6th Science 5a, 5b: 7th Science 1a, 1c, 1d, 5a, 5b: 8th Science 6a) Plants give us oxygen and sugars, worms (animals) use oxygen and sugars in respiration. Both are dependant on each other to carry out their complex internal chemical reactions. We also discuss which parts of the cell carry out these chemical reactions
- (6th Science 5e: 8th Science 6a, 6b) The interaction of plants and animals with the environment. Worms create nutrients for the plants, vice versa. Living things need nutrients, carbon, nitrogen, oxygen, etc.
- (6th Science 5a,b,c,d,e: 8th Science 6a,6b) Worms will exchange nutrients with plants, matter is transferred from one organism to another in a food web

### Action

Students divide themselves up into different groups; the number of groups depends on the size of the class. Each group is given a different area of waste to recycle: food, paper, and newspaper.

Each group will research different ways to recycle their assigned waste and discuss the most practical and feasible way to recycle the waste during class (during the small groups the instructor can guide the students towards the “practical” methods). The students then come up with a presentation to teach the rest of the class/classes their recycling method.

The three recycling projects used were recycling food waste by vermicomposting, recycling newspapers by turning them into composting flower pots, and turning waste paper into seed greeting cards.

### **Project One – Vermicomposting**

Bin “Blueprints” - The Students create a scale drawing of the main board and the pieces that will be cut out to make the bins. The students are given the original dimensions of the board and the dimensions of the pieces needed to construct the worm bins. The object of the scale drawing is to see how many pieces they can cut out of one board.

Construction of the bin – The students are given the directions and the supplies. Using the blueprints the students created they cut out the pieces and build the bins.

Prep the bins to get them ready for the worms. Create a bedding and introduce the worms to their new house. After a few weeks of the worms getting used to their new house the food collection can begin.

Earlier in the lesson the students research and discover what the worms can eat and what they can not eat. The students set special garbage cans in the kitchen to collect the unsold food everyday. At the end of lunch the designated group collects the cans, weighs the total amount collected, and separates the food into three groups: food the worms can eat, can't eat, and trash/wrappers. The students then weigh the three groups and record the results on the class chart. The worms are then fed the daily amount they can handle, the trash is disposed of, and the rest of the food is sent to the composting facility or you can set up regular compost bins in the garden.

### **Project Two - Newspaper pots**

The students found a plan to create “peat” pots out of newspaper. The group in charge of newspaper recycling taught the class how to build the pots. The pots can be used to start new plants or cuttings and when the plants begin to grow the whole pot can be planted in the ground. The newspaper eventually breaks down into compost.

### **Project Three – Seed cards**

The students researched and found the directions for recycling paper by grinding the paper into pulp. Placing water and waste paper in the blenders the students grind the paper into pulp. The pulp is placed on framed window screens and drained. As the pulp is drained the seeds are mixed into the pulp. The students flatten out the pulp and squeeze out the excess water. The screens are flipped over and the pulp is set out to dry. The paper dries within a day or two and the students spend the next period decorating the cards for an upcoming occasion.

The students packaged the seed cards with bags of compost and newspaper pots. They gave the plant starter kits to their families and parents with the pamphlets they created showing all the hard work and lessons they learned while saving our resources. The pamphlets also let the community members know how they can recycle at home.

### **Reflection**

In the beginning, the students had to reflect on their school community. They had to really think about how they, as young students, could impact their school. They also reflected on what the school was providing them. Once they agreed upon a need, then they had to reflect on how it

might affect the school and the garden. When that was established, the students were able to begin their project.

We as a class decided to create a rubric. Having a rubric gave the students a focus and clarity. While the students were busily working on their project, they had to keep reflecting on their progress, the quality of their work, the facts gathered, etc. The students were continually reflecting on their pages throughout the process. Reflection was kept in their composition books that were purchased out of the class budget. Once the project was complete the students reflected on the entire experience.

The students also used Posters, fliers, and journal writings to show the campus and community the intentions and goals of the project. Class discussions evaluate implementation of and improvements to the recycling program. Students look back on what they have learned and how it applies to real world activities by incorporating all they learned in a power point presentation. The 7<sup>th</sup> grade students then “adopted” a 6<sup>th</sup> grade class to present the material to and teach them the recycling program.

We had a huge discussion about the impact they made on their community and what they learned from this service-learning project. We discussed what was fun for them, what was difficult, if they would like to do another service-learning project again, etc.

### **Student Assessment**

Students will be assessed through informal and formal observations during class time. Informal observations consist of teacher circulating, observing, and asking questions during class time. Students will also be assessed based on the quality and accurateness of their field notes, research notes, and final product. Group effort and cooperation will also be assessed. The written reflections and project logs were the secondary assessment tools. Students completed self-evaluations halfway through the project and again at the end.

### **Project Evaluation and Expansion**

Student grades based on:

- Demonstration of knowledge of graphing and data analysis
- Creativity of pamphlets/posters
- Following directions
- Working well in groups
- Understanding of general concepts of recycling and the interaction of living organisms and the environment

After completion of all portions of the project, the participating teachers get together and discuss all the different aspects of this service-learning lesson. They look at student evaluations and participation, success of various parts, final product, and value of time used.

Evaluations determined by the students’ ability to look back on what they have learned and how it applies to real world activities through a documentary and related projects. I would do this project again with my students if I felt that they had a true understanding of the material and if they had a desire to continue into the next semester or year.

### **Celebration/Public Recognition**

A message placed in the school bulletin announces the project; regular updates periodically show the progress. They post posters and charts in class, and the regional newspaper covered their work and story. They make the student-made brochures available in other classrooms and libraries.

### **Materials and Staff Development Needs**

Materials needed:

- Books
- Calculators
- Colored Pencils
- Drawing paper
- Graph Paper
- Markers
- Paper
- Pencils
- Poster Board
- Poster Paper
- Rulers
- Still Camera.
- Trash Bags
- Rubbermaid bins

Foodservice Staff needs to know about student participation and how they will handle the waste. Staff can also make other classes aware of the ongoing project. Other classes can read or distribute the flower pots, compost, seed cards, or pamphlets.

#### **Funding and Resource Support/Sustainability**

Initial funding is needed for the purchase of: worms, worm bin material, blenders, screens, wood frames, seeds, and garbage cans (Approximately \$200.00). After the initial investment the program is self sustaining and most materials are used year after year. The only consumable is the flower seeds which is less than \$20.00 a year. Compost was sold at a significant amount to help contribute to the sustaining of this project and the garden club.

## Recycle Questions

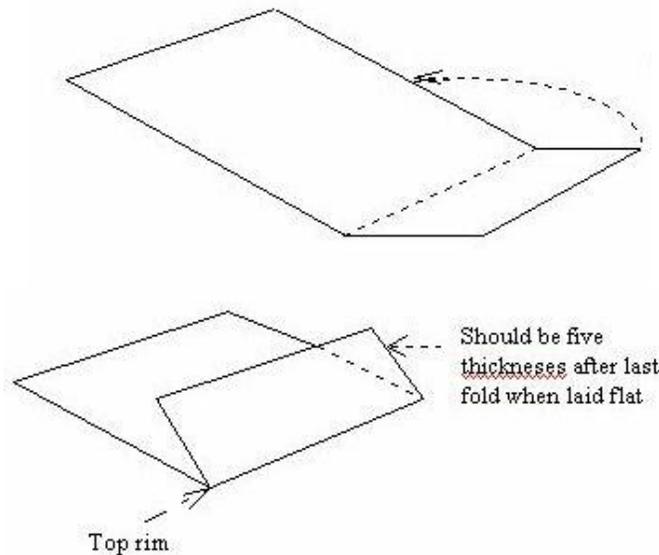
Answer Questions 1 through 7 on a sheet of paper, these first 7 questions are due at the end of the period. Answer questions 8, 9, and 10 on another sheet of paper. 8, 9, and 10 are due next Friday along with #11. Follow the directions for the pamphlet, question #11. Have fun ☺

- 1) Do you know the meaning of the term "recycle"?
- 2) Do you recycle? Why do you or why don't you recycle?
- 3) What materials do you recycle?
- 4) How do you recycle?
- 5) Where do you recycle?
- 6) How much time is devoted to recycling each day or week?
- 7) Do you think you could recycle more?
- 8) Think of a household item that you would normally not recycle and think of a new use for it when you are finished using it.
- 9) Calculate the total food recycled from 4/17/02 to 5/02/2002
- 10) Calculate the average amount of food we recycle a day
- 11) We will not be able to attend the computer lab to create a pamphlet. Your job is to create a pamphlet that either informs people about the worm composting, the recycled paper seed cards, or the newspaper flower pots.
  - Grading for the pamphlet is as follows:
    1. A: It must be a Tri fold pamphlet, at least three colored drawings, describe one of the tasks (composting, the card, or flower pots), directions on how to create it, the benefits of it for yourself and the planet, why you should do it. On the back, your name, the date, and 7<sup>th</sup> grade life science.
    2. B: Missing the colored drawings
    3. C: No drawings, no directions on how to create it.
    4. D: No drawings, no directions on how to create it, missing one more item
    5. F: No drawings, no directions, missing two more items
    6. Zero: Anything less than an F pamphlet

## 'JANDORR' Newspaper Plant Pots

If you're concerned with keeping costs low, or simply want to be more environmentally - friendly, you can make bio-degradable plant pots from newspaper. One sheet (two pages) of tabloid makes a pot about 65mm square and 77mm high. One sheet of a broadsheet gives 100mm square by 95mm high. Here, with thanks to Maurice Larcombe for the original text and diagrams, is how...

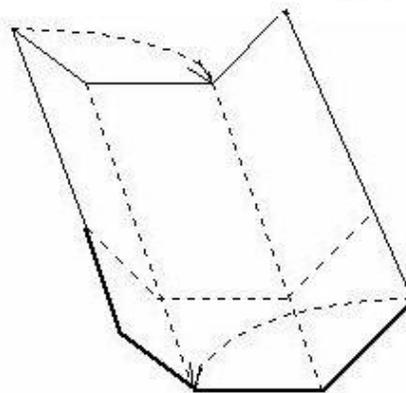
1. Paper flat in front of you short edge toward you. (Call this the top).



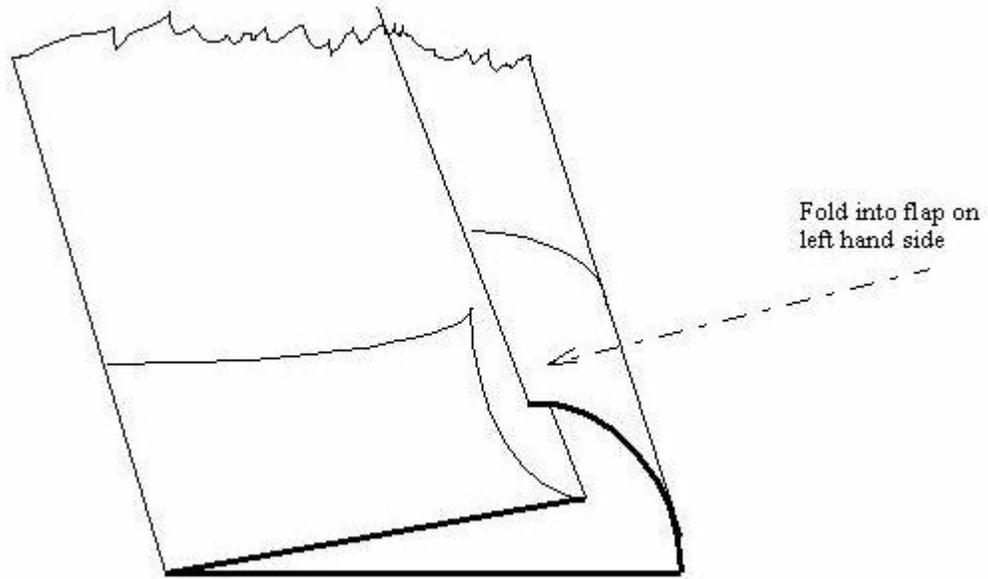
2. Fold nearest edge to centre. Fold nearest edge to centre again. Make a third fold the same size which should be half way down the sheet. This crease will be the top rim of the pot.

3. Turn paper over keeping top rim toward you.

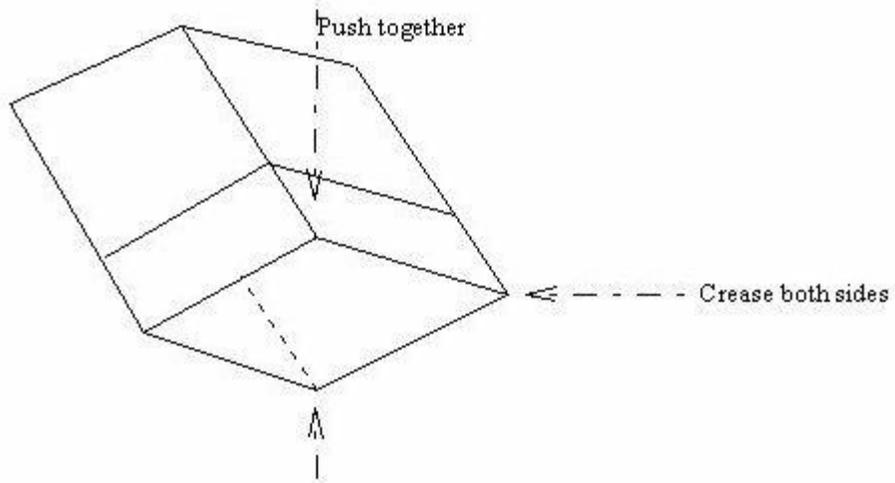
4. Divide paper into thirds; fold left third over first then right third. Make good creases down the folds.



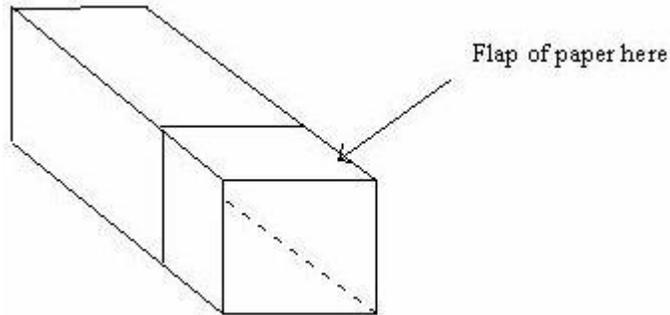
5. Tuck right hand flap into left hand. You should now have a flat tube with your original folds on the outside; top toward you.



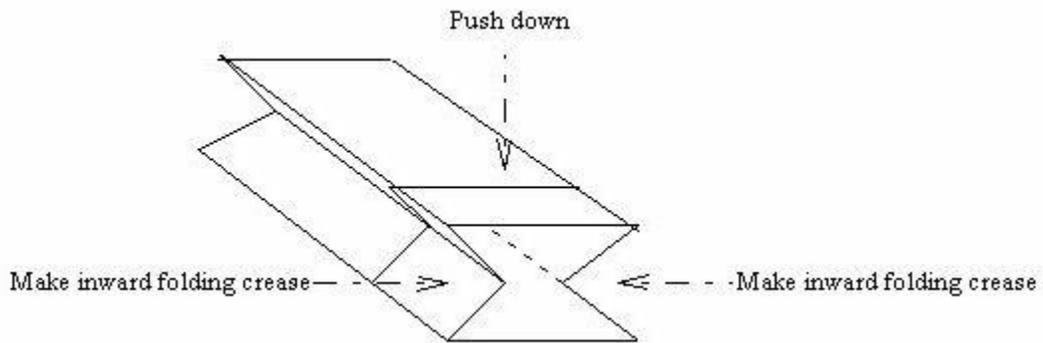
6. Turn paper on edge and push lengthways creases inwards together and make two more lengthways creases down the paper.



7. Open out top to form a square and place facing you. One of the sides will have a flap. Have this flap on the top.

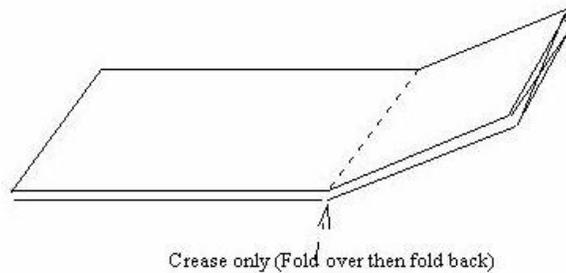


8. Push two of the opposite sides inwards pushing down on top of the square at the same time. Make inward creases down the length of the tube.

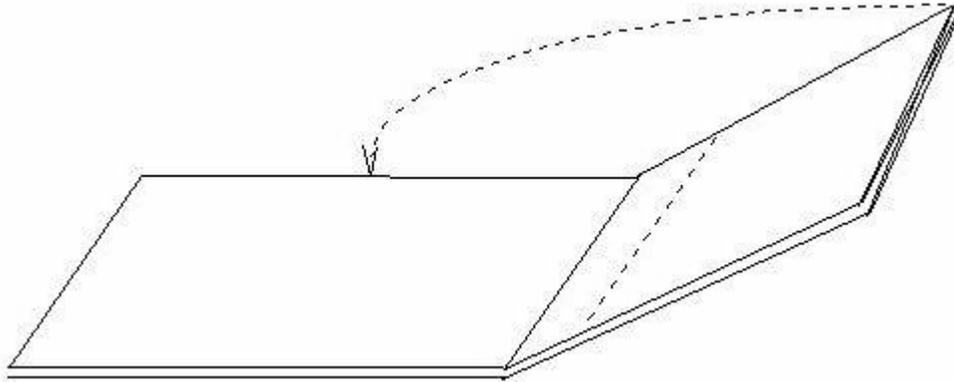


Having the top of the pot toward you up to this stage is to make explanation and illustration easier. Once you have the folds mastered there are numerous ways of making them.

9. Turn paper so that the top is to your right (left handers may find it easier with the top to the left) and make an upward crease, under the folds.

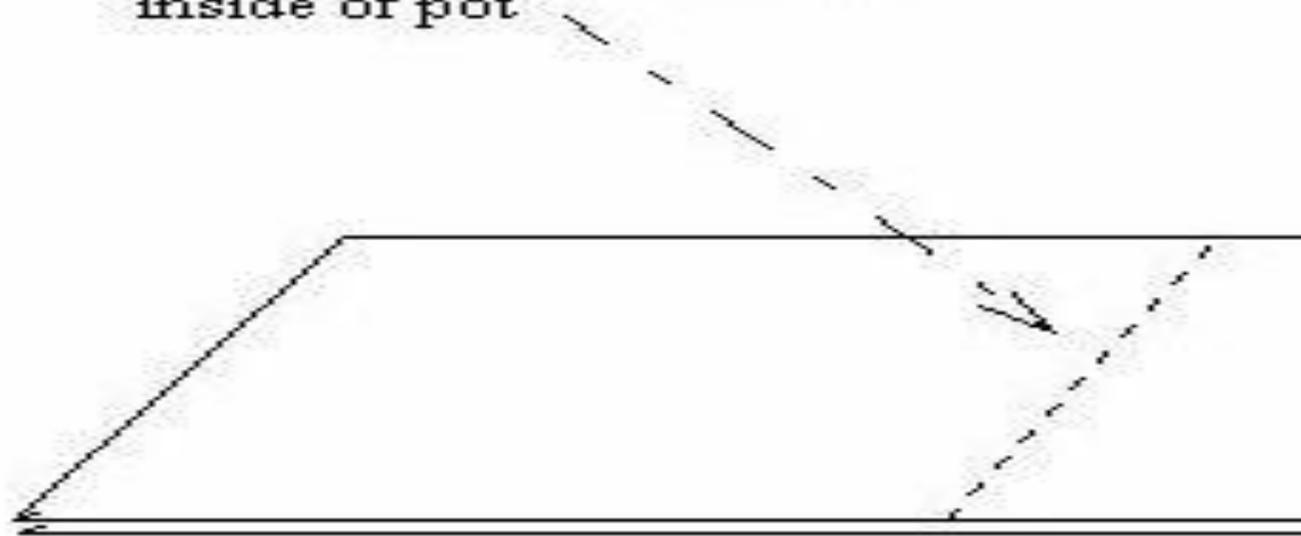


10. Make an upward fold, (half of pot size) to the left of the last crease, fold down flat and make a good crease.



11. Open up the last fold; stand the pot upright and open up the square at the top of the tube, pushing the inwards folds outwards and creasing bottom of pot into a square. Finally fold the 'tail' up the side of the pot, over the rim and into the inside of the pot.

C. Crease and fold into  
inside of pot



**California Native Plant Coloring Book**  
**A Service Learning Project**  
**Lesson Plan Profile**

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**Abstract**

The 7<sup>th</sup> grade students at Monte Vista Middle School gathered in small groups to identify different problems on campus. The main problems the students identified: The school throws away 2- thirty gallon trash cans of unsold food every day. Two to Three pounds of paper per classroom are tossed out each day. Every baseball season, trash increases on campus.

The students then proposed the collection of the waste on campus, develop different ways to recycle the collected waste, and distribute the recycled products throughout the community. The students display and inform the school and public about their lessons in pamphlets, posters, and journals.

**Degree of Complexity for Implementation**

Medium

**Educational Setting**

**Educational Institution**

Public

**Comprehensive Schools**

6-8

**Alternative Settings**

Resource classes, Special Day Classes

**School Schedule**

Traditional 9 month

**Service Provided**

**Overview of Service**

**Level of Service**

Direct Service

**Service Issue Area**

Education  
Science  
Social Needs  
Environmental

**Duration of Service Activity**

Long Term Entire School Year

## **Specific Service Activity Areas**

### **Educational**

Teaching Activities  
Environmental Education  
Life Science

### **Social Needs**

Environmental Protection

### **Lesson Content**

### **Subject Area(s)**

Science

### **California State Academic Content Standards**

6<sup>th</sup> Grade Science 5a,b,c,d,e, 6a, 6b  
7<sup>th</sup> Grade Science 1a, 1c, 1d, 5a, 5b, 7a, 7b, 7c, 7d  
8<sup>th</sup> Grade Science 6a, 6b

### **Collaborating Partners**

#### **Educational Institutions**

High Schools

#### **Individual Partners**

Friends  
Parents

### **Reflection**

Journals  
Questions  
Oral presentation  
The Finished Product  
Pamphlets