

K-12 PUBLICATIONS AND HANDOUTS BY MARY CARLA CURRAN
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PEER-REVIEWED K-12 PUBLICATIONS

Aultman, T. **M.C. Curran**, and M. Partridge. 2010. Bringing scientific inquiry alive using real grass shrimp research. *NSTA Science Scope* 33(7):54-60.

Hoover, K.M. and **M.C. Curran**. 2010. Trash Pie: Is your school serving. *NSTA: Science and Children* 47(7):54-57.

Mace, M.M., and **M.C. Curran**. 2009. Fiddlin' around with fiddler crabs. *Current: The Journal of Marine Education* 25(2):39-46.

Aultman, T. and **M.C. Curran**. 2008. Grass shrimp: Small size but big role in food web. *Current: The Journal of Marine Education* 24(3):29-33.

Fogleman, T. and **M.C. Curran**. 2008. How accurate are student-collected data? *NSTA The Science Teacher* 75(4):30-35.

Fogleman, T. and **M.C. Curran**. 2007. Making and Measuring a Model of a Salt Marsh. *NSTA Science Scope* 31(4):36-41.

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Fogleman, T. and **M.C. Curran**. 2006. Save our salt marshes! Using educational brochures to increase student awareness of salt marsh ecology. *Current: The Journal of Marine Education* 22(3):23-25.

Curran, M.C. 2003. Learning the metric system: Calculating fish distributions, densities, and means using candy fish. *Current: The Journal of Marine Education* 18(4):28-31.

PEER-REVIEWED K-12 PUBLICATIONS IN PRESS:

Hoover, K.M. and **M.C. Curran**. It's easy being green. *Current: The Journal of Marine Education*.

K-12 PUBLICATIONS IN REVIEW

Bowen, S.R., T.M. Cox, and **M.C. Curran**. What are bottlenose dolphins doing on land? An activity teaching the scientific method through the unique behavior of strand feeding.

WEB PUBLICATIONS

Schaffner, H., and **M.C. Curran**. 2005. Flatfish in motion: A movement activity.
<http://www.lessonplanspage.com/SciencePEArtLAMDFlatfishMovementActivityK2.htm>

Schaffner, H., and **M.C. Curran**. 2007. Don't Eat Your Flatfish Before they are Counted - A Flatfish Data Collection Activity.
<http://www.lessonplanspage.com/SciencePEArtLAMDFlatfishDataCollectionActivityK2.htm>

Schaffner, H., and **M.C. Curran**. 2007. Each One Teach One Flatfish Fun Activity.
<http://www.lessonplanspage.com/SciencePEArtLAMDFlatfishEachOneTeachOneActivity35.htm>

Making the most out of trash: Teaching math and language arts through recycling
Krista Hoover and Mary Carla Curran

Abstract

For Earth Day, elementary school students assessed the amount of trash generated in the cafeteria and compared school vs. home lunches. Food scraps was the highest component of home lunches, while plastic was the dominant component of school lunches. Students were dismayed by the amount of potentially recyclable material that was being discarded and wrote letters to request that a recycling program be started, which is now one of the first student-driven recycling efforts in our county. Students now collect classroom recyclable material on a weekly basis. Weights are obtained and we compare variability across grade levels. Students have learned math skills, language arts, and problem solving while working together to lessen the footprint created by a school. We'll work through this activity together.

Table 1. Cafeteria Trash Survey Handout (per count)

The percent of total is calculated by dividing the total number of items within a category (ex. food scraps) by the overall total number in the lower right of the table. Then, multiply by 100.

Please circle lunch choice: School or Home	4-17-06	4-18-06	4-19-06	4-20-06	4-21-06	Total	% of Total
Food Scraps							
Paper							
Cardboard							
Aluminum							
Plastic							
TOTALS							

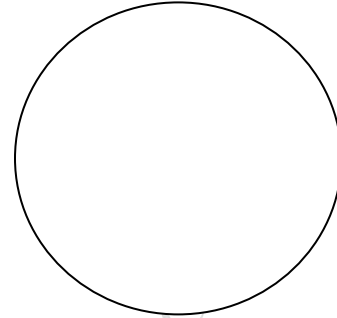
Courtesy of NSTA Science and Children (2010) by Curran (2010)

Trash Pie My Oh My

Name: _____ Date: _____

1. Create a pie chart in the circle provided.

2. What two values are most similar to the overall classroom pie chart? Why do you think that is?



3. Which two values are the most different? Why do you think that is?

4. How did your data collection (trash counting) change over the course of the week? What did you notice later in the week that didn't occur to you sooner? Did your lunch packing or eating habits change?

5. What percent of the trash is biodegradable? What percent is not?

6. What did you like about this activity?

7. What could be improved?

8. In your letter to discuss recycling, what was your strongest argument/best sentence? What do you hope will come out of your effort?

9. What would you like to do for Earth Day next year?

10. What can you do to reduce waste at home and at school?

Survey Handout

1. Where does your trash go after you throw it away?

2. What can you do to reduce waste?

3. Do you eat school lunch or home lunch the majority of the time?

4. What affects your lunch decision?

5. What materials do you recycle?

6. Do you think recycling is worthwhile? Why or why not?

7. How many aluminum cans do you use in a week? _____ About what % do you recycle? _____%

Courtesy of NSTA Science and Children (2010) OR Current (2010)



Recycling, It Really Does Add Up! Name: _____

We collected recyclable materials from each grade level, Kindergarten-5th, at White Bluff Elementary to determine the amount of recycling generated in a week.

1. Which grade level do you think generated the most recycling?

Circle: Kindergarten 1st 2nd 3rd 4th 5th

Here are the data from each grade level.

Table 1. Total recycling weight by grade from White Bluff Elementary School on 6-5-09.

Grade level	Container + contents (lbs)	Container weight (lbs)	Recycling weight (lbs)	Recycling weight (kg)
K	303.4	283.8		
1	272.0	254.5		
2	60.6	58.2		
3	575.3	541.8		
4	232.6	221.5		
5	133.0	122.3		
Total				

2. For each grade level, calculate the amount of recycling in lbs and fill in the chart above (use the space below to show your work).

3. Now convert each grade level's total from pounds (lbs) to kilograms (kg).

[HINT: 1 lb = 0.45 kg (use the space below to show your work)]. For example: 26 lbs x 0.45 kg/lb = 11.7 kg.

4. Which grade level recycled the largest amount? _____ Why do you think that is?

What was the average amount of recycling per grade? (Hint: take the total recycling weight and divide by the number of grades.) _____ lbs _____ kg

5. We collected data from more than one classroom (or teacher) for each grade level. Why do you think we did this?

6. Are the actual results different than what you predicted in question 1? Why?

7. What is the total amount generated by this school in one week? _____ lb _____ kg

8. If there are 36 weeks of school per year, what is the estimated amount of recycling that would have been collected from this school in 2009?

_____ lbs _____ kg

9. If there are 48 public schools in Chatham County, how much recycling would be collected from these schools in one week and one year? Use the total amount of recyclable material from White Bluff Elementary.

week: _____ lbs _____ kg year: _____ lbs _____ kg

10. The average person throws away 4.4 lbs of trash per day, but only 3.1 lbs can be recycled. What percentage of the trash can be recycled?

_____ %

Lights, Camera, Action! Name: _____

You will be creating a 30-60 second Public Service Announcement on recycling. Break up into groups of 3-5.

Here is some information from: **Recycling Benefits and Facts** (to be used for your public service announcement) *Information supplied by: National Recycling Coalition and www.bringrecycling.org/benefits.html*

- ♻ Well-run recycling programs **cost less** to operate than waste collection, landfilling, and incineration.
- ♻ Recycling creates 1.1 million U.S. jobs.
- ♻ Every ton of paper that is recycled saves 17 trees.
- ♻ The energy we save when we recycle one glass bottle is enough to light a light bulb for four hours.
- ♻ It is important to reduce our reliance on foreign oil. Recycling helps us do that by saving energy.
- ♻ It takes 95% less energy to recycle aluminum than it does to make it from raw materials. Making recycled steel saves 60%, recycled newspaper 40%, recycled plastics 70%, and recycled glass 40%.
- ♻ A national recycling rate of 30% reduces greenhouse gas emissions as much as removing nearly 25 million cars from the road.
- ♻ Recycling prevents habitat destruction, loss of biodiversity, and soil erosion associated with logging and mining.
- ♻ Americans discard enough aluminum to rebuild our entire commercial air fleet every 3 months.
- ♻ One recycled aluminum can saves enough electricity to operate a TV for 3 hours.
- ♻ Recycling a glass bottle saves enough energy to light a 100-watt bulb for 4 hours.
- ♻ If you stacked up all the paper an average American uses in a year, the piles would be as tall as a two-story house.
- ♻ Every American uses almost 200 pounds of plastic in a year.
- ♻ Americans use 4 million plastic bottles every hour-yet only 1 bottle out of 4 is recycled.
- ♻ Americans use 100 million steel cans a day. We throw away enough steel every year to build all the new cars made in America.
- ♻ The world's forests are being destroyed at the rate of one acre per second.
- ♻ In a lifetime, the average American will throw away 6500 times his or her adult weight in garbage. For example, a 150 lb adult will leave a legacy of 90,000 lbs of trash.

Courtesy of NSTA Science and Technology (2010)

Waste not, want not. Name: _____

One third grade class was able to initiate a recycling program for an entire school in Savannah, GA. Now it's your turn to create a waste reduction plan for your home or school. The purpose of this plan is to minimize or reduce the amount of waste generated.

For home, think about:

- Water
- Electricity
- Heating/cooling
- Food habits (fresh vs. prepackaged foods)

For school, think about:

- Recycling/trash
- Lunch room waste
- School supplies
- Energy conservation

What's your Waste Reduction Plan?

1. What problems do you foresee in putting this plan in motion?

2. What help or assistance would you need?

Courtesy of NSTA Science and Children (2010) OR Current (2010)