

# Boxes for Water: We Can Make a Difference

*Nancy Espetveidt*



This activity has excellent potential to incorporate aspects of all core subjects. Most important, though, it offers students the opportunity to start a project and follow through to a very tangible end: they will create a significant difference in the lives of others. The activity is based on the collaborative efforts of the group, thereby building communication skills and cohesion (especially if the activity is shared with other classrooms) as they learn together the potential of socially responsible citizenship. The students will immerse themselves in the project and will learn to appreciate the ways in which they use mathematics in their daily lives. This is an exceptional way to teach the concepts indicated because they are used authentically and meaningfully. Through this experience, the mathematical vocabulary will become a part of students' daily lives. There is great potential with this project—the sky is the limit! This article serves as an introduction and explains math processes the students will practise (possible crosscurricular connections are attached as Appendix A).

## 2007 Mathematics Curriculum, Grade 3

**Strand: Number**

**General Outcome**

Develop number sense

**Specific Outcomes**

8. Apply estimation strategies to predict sums and differences of two-digit numerals in a problem-solving context.
11. Demonstrate an understanding of multiplication to  $5 \times 5$  by
  - creating and solving problems in context that involve multiplication and
  - relating multiplication to repeated addition.

**Strand: Statistics and Probability (Data Analysis)**

**General Outcome**

Collect, display and analyze data to answer questions

**Specific Outcomes**

1. Collect first-hand data and organize it using tally marks and charts to answer questions.
2. Construct, label and interpret bar graphs to solve problems.

—Alberta Learning 2007

## Required Materials

- Chart paper and markers for running tally
- Calculators to help figure out year-long results
- Chart with jobs and names (to be decided each Monday by drawing popsicle sticks with students' names)
- Questions to get students thinking about the task
- Handout: How Many Boxes?
- Book: *One Well: The Story of Water on Earth* (Strauss 2007)

## Overview

In this project, students collect juice boxes, clean them out and save them for recycling. The class will keep a running tally of the juice boxes recycled and the amount of money that has consequently been saved (each juice box is worth \$0.05). The application is a daily task with weekly rotating duties for different class members. The goal of the application is to raise enough money to sponsor a potable water site through Ryan's Well Foundation ([www.ryanswell.ca](http://www.ryanswell.ca)). The students will start with their own classroom and, hopefully, the initiative will spread to include the collection of juice boxes from other classes in the school.

## Introductory Project

- Begin by reading *One Well: The Story of Water on Earth*, by Rochelle Strauss. Reflect with the students on the issue of potable water. Many people in the world don't have access like we do to clean water; but there are ways we can help.
- Explain to the students that, while it is part of our responsibility to the Earth, recycling can also help us to earn money. "Each juice box is worth five cents. How many of you bring juice boxes in your lunches?" Introduce the idea that we could use the money from recycled juice boxes to help a community gain access to clean, drinkable water.
- Following are some sample questions to help students meet curricular objectives:
  - For estimation strategies
    - Number strand, objective 8:  
If Room 11 uses 9 drinking boxes a day and Room 15 uses 23, how many drinking boxes would that total in a day?
    - Number strand, objective 11:  
If our classroom uses 5 drinking boxes a day, how many would that be in a school week (5 days)? Each box is worth 5 cents. How much money would we have collected at the end of the week?  
If we collect 50 juice boxes on each of Monday, Tuesday, Wednesday, Thursday and Friday from the whole school, how many juice boxes would we have at the end of the week?
- Hand out the worksheet "How Many Boxes?" and work with the students to answer the questions. (The math is fairly advanced and requires decoding. Discussion is to be ongoing). Discuss time frame and class average of juice boxes: Who has a juice box today? Let's say that you bring the same number every day. How many days/weeks would it take for us to save \$10.00? How will \$10.00 make a difference?

If the class averages about 15 boxes a day, or 75 cents a day:

$$15 \times 5 = 75 \text{ juice boxes/school week}$$

$$75 \times .05 = \$3.75/\text{week}$$

$$\$10.00 = 1,000 \text{ cents}$$

$$1000 \text{ cents} = 13.3 \text{ days (just over 13 days)}$$

$$75 \text{ cents}$$

Students are encouraged to use their own strategies to solve this problem; eg, repeated addition, tens charts, students could use 5 cents instead of \$0.05, and so on.

## Making It Happen

The next step is to make it happen—we can do it! Explain the process, including descriptions of jobs. You may wish to put up a job description sheet on the overhead while you describe each job (ask why these jobs are important as you go through the descriptions; ask for any input the students might have regarding organization and expectations). Distribute tally sheets and let the students know that the sheets are to be kept up to date with all information filled in each week.

### Job Descriptions

- **Box Collector:** Picks up boxes after lunch and takes them to classroom sink. This job may need more students depending on how many classrooms become involved. It will be better organized if one person is in charge.
- **Box Cutter:** Carefully cuts off the top of each box so that it can be easily rinsed.
- **Box Rinsers:** Rinses each box to make sure there is no juice left inside. This is important to avoid the boxes getting mouldy.
- **Squisher/Packer:** Flattens all of the juice boxes and packs them into bags for the recycle depot. (If we flatten them, more will fit in each bag.)
- **Tallier:** Counts the boxes and tallies them on the classroom chart. Note: all students will have their own tally charts, in project folders, which they are expected to update daily and keep current.

### Extensions

Hopefully, this activity will extend to other classrooms as well, which raises the students' level of responsibility as well as the level of mathematics (larger numbers). If that is the case, it might be helpful to create a bar graph that tracks the juice boxes contributed by each class.

Problems can be extended to include the school year (197 days) and can be worded in a way that requires more decoding. For example:

If there are 25 students in the class and an average of 15 students bring juice boxes every day for lunch, how many juice boxes will there be at the end of the week? How much money will that be?

### Modifications

- Do the project on a smaller scale—perhaps proceeds could be donated to a local charity.
- Start the project as a hypothetical application to gauge students' ability and to generate interest.

## Vocabulary

Bar graph: A graph that uses bars to show data

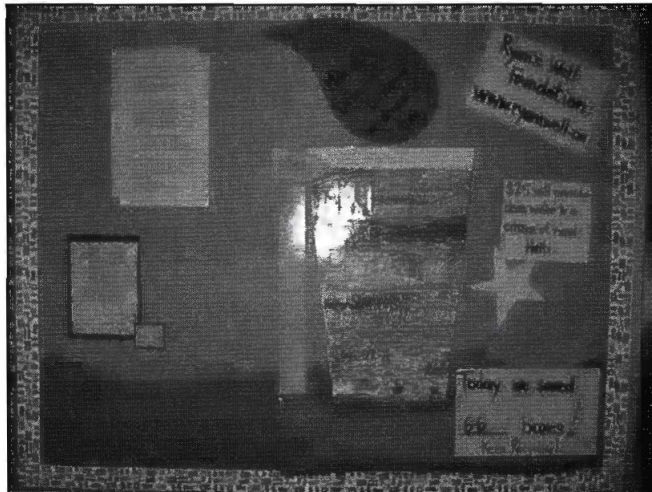
Tally table: A table that uses tally marks to record data

Data: Information collected about people or things

## Assessment

The aim of this project is to demystify mathematics by using it daily to reach a certain goal. The mathematics is not an end in itself but a means to achieving an end that is meaningful. Nevertheless, it is important that students understand the mathematics involved. Following are some ways in which you may assess students' understanding and whether or not the curricular objectives set out at the beginning of the lesson are being met.

- Check on the students' tally charts once a week:
  - Are the sheets being kept up to date?
  - Is there a total dollar amount for each week?
  - Can the student explain to you the significance of the tally marks?
    - What do the marks represent?
    - What is the purpose of keeping the chart?
- Mark the "How Many Boxes?" worksheets or have the students discuss them, in groups. During the discussion, move through the classroom and take note of students' responses.
  - How did they figure out the answers?
  - Are they making the connection between repeated addition and multiplication?
  - What tactics are they using? (For example, estimation strategies? Invented strategies? If so, can they explain them?)



*Bulletin board: each day the water level rose in the glass based on the number of juice boxes collected. The scale on the slide is counted in dollar amounts, one notch per dollar.*

*Presentation at whole-school assembly. Glenna Haig and Nancy Espetveidt.*



- Fill in the Job Duties Checklist for each student as he or she performs the assigned role for the week. This could aid in assessing attitude as well as gauging interest in the project.
- As a conclusion to the project, have the students reflect on their experience, their feelings, the math they used daily and so on. Students could write letters addressed to themselves or write journal entries, among many other possibilities.
- A rubric is included for consideration.

## Reflection

Boxes for Water was successfully implemented as a whole-school project, with Grade 6 students taking turns collecting, counting, and tallying the juice boxes. To date, more than \$150 has been raised and sent to Haiti through Ryan's Well Foundation. Ryan's Well sponsors several projects that need assistance; however, keep in mind that there are other organizations as well. Research the organization and project you would like to contribute to, or do the research and decide as a class. I chose Ryan's Well because it is Canadian, it was started by a student (students can relate to this) and it has a comprehensive website.

The goal of the project was to show students that by directing their energy and being aware, they could make a difference in the world. The students did not have to change their habits—they had always recycled their juice boxes, but now the proceeds were redirected and the results were astounding. The entire school was involved and was kept up to date with

weekly announcements, daily updates to a bulletin board in the main hallway (managed by the Grade 6 students) and announcements at whole-school assemblies.

From the mathematics to the students' genuine interest, this project was a great success. Although it is time consuming to dedicate a part of each lunch hour (about 20 minutes) to counting, tallying and updating the bulletin board, the students were enthusiastic and the whole process became smoother as they became familiar with each job. I suggest that the bulletin board be updated daily, because it garners interest from passersby. Often, students of all grades and classes would gather around the board and discuss our progress. It was an excellent schoolwide team-building experience.

## References

- Alberta Learning. 2007. *Mathematics Kindergarten to Grade 9 Program of Studies*. Edmonton, Alta: Author.
- Strauss, R. 2007. *One Well: The Story of Water on Earth*. Toronto, Ont: Kids Can.

---

*Nancy Espetveidt graduated from the University of Alberta, where she is still involved in research projects. She is passionate about instructional design and enjoys sharing strategies to deliver curricular material in unique and engaging ways. Nancy is currently teaching Grade 4 at Bears paw Elementary School, in Edmonton, Alberta.*

## Appendix A: Crosscurricular Connections

### English Language Arts

- **General Outcome:** Discover and Explore
  - **Specific Outcomes:** Express ideas and develop understanding
    - Explain understanding of new concepts in own words
    - Explore ideas and feelings by asking questions, talking to others, and referring to oral, print, and other media texts
- **General Outcome:** Students will listen, speak, read, write, view and represent to manage ideas and information.
  - **Specific Outcome:** Plan and focus
    - Use self-questioning to identify information needed to supplement personal knowledge on a topic.
    - Identify facts and opinions, main ideas and details in oral, print and other media texts.
  - **Specific Outcome:** Determine information needs
    - Ask topic-appropriate questions to identify information needs.

### Science

- **General Learner Expectation:** Demonstrate positive attitudes for the study of science and for the application of science in responsible ways.
  - **Specific Learner Expectation:** Students will show growth in acquiring and applying the following traits:
    - A willingness to work with others in shared activities and in sharing of experiences
    - Appreciation of the benefits gained from shared effort and cooperation
    - A sense of responsibility for personal and group actions
    - Respect for living things and environments, and commitment for their care

### Social Studies

- **General Outcome:** Students will enrich their awareness and appreciation of how people live in other places.
  - **Specific Outcome:** Students will examine the geographic characteristics that shape communities in other parts of the world by exploring and

reflecting upon the following questions for inquiry:

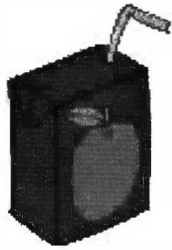
- In what ways do the people in the communities depend on, adapt to and change the environment in which they live and work? (Economics and Resources; The Land, Places and People)
  - In what ways do the communities show concern for their natural environment? (Global Connections; The Land, Places and People)
  - How does the physical geography influence the human activities in the communities (eg, the availability of water, climate)? (Culture and Community; The Land, Places and People)
- **Global Citizenship General Outcome:** Students will demonstrate an understanding and appreciation of Canada's roles and responsibilities in global citizenship.
    - **Specific Outcomes—Values and Attitudes:** Students will
      - appreciate elements of global citizenship:
        - recognize how their actions might affect people elsewhere in the world and how the actions of others might affect them (Citizenship; Global Connections)
        - respect the equality of all human beings (Citizenship; Global Connections; Identity)
    - **Specific Outcomes—Knowledge and Understanding:** Students will
      - explore the concept of global citizenship by reflecting upon the following questions for inquiry:
        - What are some environmental concerns that Canada and communities around the world share? (Economics and Resources; Global Connections)
        - In what ways can individuals and groups contribute to positive change in the world? (Citizenship; Global Connections; Power, Authority and Decision Making)

*Editor's note: Material in this appendix is from the Alberta Education programs of studies:*

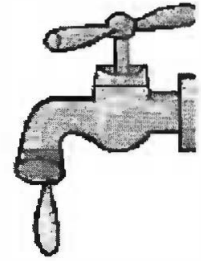
Alberta Education. 1996. *Science (Elementary) Program of Studies*. Edmonton, Alta: Author.

———. 2005. *Social Studies K–12 Program of Studies*. Edmonton, Alta: Author.

Alberta Learning. 2000. *English Language Arts (K–9) Program of Studies*. Edmonton, Alta: Author.



## Appendix B: Project Worksheets and Rubric



### How Many Boxes?

Each juice box is worth 5 cents. If our class saves 10 boxes in one day, how much money will we collect?

If we saved the same number of boxes each day, how many boxes would that be in a school week?

How much money would that be in a school week?

How many juice boxes will we need to save in order to collect \$1.00?

How many juice boxes will we need to save in order to provide:

\$10 = 1 person's weekly access to water

\$50 = 1 household's daily needs

\$100 = 1 household + 1 farm's needs

Week: _____	
Job	Name
<b>Box Collector</b> Picks up boxes after lunch and takes them to classroom sink.	
<b>Box Cutter</b> Carefully cuts off the top of each box so it can be easily rinsed.	
<b>Box Rinser</b> Rinses each box to make sure there is no juice left over.	
<b>Squisher/Packer</b> Flattens all of the juice boxes and packs them into bags for the recycle depot.	
<b>Tallier</b> Counts the boxes and tallies them on our classroom chart.	

Week: _____	Number of Juice Boxes
Monday	
Tuesday	
Wednesday	
Thursday	
Friday	

Total: \_\_\_\_\_  
           × \$ 0.05  
 = \$ \_\_\_\_\_

	<b>Wow! That was amazing!</b>	<b>Great job!</b>	<b>Good work!</b>	
<b>How Many Boxes?</b>	Your work is detailed and your answers are correct.	Your work is somewhat detailed and your answers are mostly correct.	Your answers are correct but you did not show your work.	Your answers need some correcting and you need to show your work.
<b>Keeping a Tally Chart</b>	Your project folder is very organized and complete. You kept your tally charts up to date and they are in order.	Your project folder is organized and mostly complete. Most of your tally charts up to date and they are in order.	Your project folder is somewhat organized and mostly complete. Some of your tally charts are up to date and they are in order.	Your project folder is incomplete and not organized. Your tally charts are not up to date and they are not in order.
<b>Solving the Problem/ Repeated Addition</b>	You are able to explain the math in our project very clearly, using your own words and ideas. You have made the connection between repeated addition and multiplication.	You are able to explain the math in our project fairly clearly and you give reasons for your answers. You show evidence of the connection between repeated addition and multiplication.	You are able to answer questions about the math in our project and you begin to share your ideas with the teacher's help. You show repeated addition, but do not connect it to multiplication.	You explain the math in our math project in a disorganized fashion that is difficult to follow. There is no evidence of repeated addition or its connection to multiplication.
<b>Math Reflection</b>	Excellent reflection. You communicated your feelings about the project and the math we practised very clearly.	Great reflection. You communicated your feelings about the project and the math we practised.	Good reflection. You wrote about the project and the math we practised.	Your reflection does not communicate your feelings about the project or the math we practised.

# We can do it!