

BETTER SHOP AROUND

*an inquiry based mathematics lesson from the laptop*¹ of Alan Thomas

Objectives :

The purpose of this exercise is to familiarize students with fractions, decimals, proportional thinking and surface area in a relevant context. Furthermore, the exercise should demonstrate for students the importance of mathematical literacy and quantitative decision making.

Content Standards Addressed :

This problem may be used to address, at least in part, the following South Carolina Curriculum Standards (grade levels indicated in parentheses):

- α) Solve real-world problems involving fractions, decimals, and percents. (8^{th})
- β) Compare and order rational and irrational numbers and find their approximate locations on a number line. (8^{th})
- γ) Create and write ratios and proportions from applied situations and explain the reasoning used. (7^{th})
- δ) Select appropriate methods and tools to solve problems requiring the use of rational numbers. (8^{th})
- ϵ) Compute with rational numbers to solve a variety of applied and mathematical problems. (8^{th})
- ζ) Determine the changes in volume and surface area of three-dimensional figures that can be built with cubes when one or more measurements are changed. (8^{th})
- η) Use appropriate units of measure to label surface area and volume. (8^{th})
- θ) Use measurements and formulas to solve real-world and mathematical problems. (7^{th})
- ι) Determine the unit rate. (7^{th})
- κ) Use measurements and formulas to solve real-world and mathematical problems. (8^{th})

Materials and Preparation:

Go to your local grocery store and buy two boxes of different sizes of your favorite cereal. Record the respective prices of the cereal. Walk around the store and record the prices and amounts of different types of foods, beverages, et cetera. For each item you record, find the same item packaged in a different amount and record its price and amount also. For example, one might write:

10 lbs Acme long grain rice..... 4.99

5 lbs Acme long grain rice..... 3.29

It is preferable that you pick one item measured by quantity, one measured by weight (or mass), and one measured by volume. You will most likely find that the unit price

¹created using LaTeX

is less on the package with the greater amount. Now search the store and find an item for which the unit price is greater on the package with the greater amount (it may take awhile, but there is always one there). You might wish to buy this item also but it is not crucial to the exercise so long as the item, the amounts, and the respective prices are recorded. After purchasing the cereal, measure out the unit amount of the cereal (most likely ounces) and put it in a bag.

A pair of rulers will also be needed for this exercise.

Activity:

Present the students with the two boxes of cereal and the price of each. Tell them to work in groups to answer the question: *Which box of cereal is a better deal?* Give the students several minutes to think about the question and allow them to examine the boxes if they so desire. After the students have had ample time to ponder the question, show them the unit measure of cereal and guide them to the idea of unit price.

After having answered the previous question, ask the students: *Are larger packages always a better deal?* Give students the amounts and prices of two or three other items and ask them to decide which package is a better deal. (Note: save your instance of an item for which the unit price is greater on the package with the greater amount for later.) Talk about the results from these examples. Then ask the students: *Why do larger packages tend to be a better deal?*

At this point we can introduce the role the packaging itself might play in the cost of items. Have the students work in groups to measure the sides of each of the two cereal boxes. Have them then determine the volume and surface area of each of the two boxes. Ask the students in each of the two cases: *How much cardboard (as an area) do we need for each unit of cereal?*

The last part of this activity is to present students with the example of an item for which the unit price is greater on the package with the greater amount. Have them determine the unit price of the item and ask them which package is a better deal. Ask the students: *Why might the smaller package be a better deal?* Strongly suggest to students that companies might wish to take advantage of people that are not as quantitatively savvy as they.

Review:

Review the mathematics involved in the activity and take time to discuss with students the importance of mathematics in making every day decisions.