



Grade 7/8 Math Circles

February 16-17, 2016

Create your own Business

Rules of the Game

1. Each group starts with \$50 to buy items from the warehouse (*ie. me*).
Note: You **must** spend all of this \$50 at the warehouse by the end night.
2. Once you've bought all the items you want from the warehouse, as a group, decide on a price for each of your items. Then ask me and I will give you the price labels.
3. If you have 5 people in your group, pick 2 people to be the sales people, 2 others to be the consumers (who will go around and buy items from the other businesses) and 1 person in charge of buying items from the warehouse. If you have 6 people in your group, just have 3 salespeople.
4. I will give each group a "debit card" with \$50 on it, and every time you buy an item, give your 'card' to the seller and they will record the transaction.
Note: You **must** finish all the money on the debit card by the end of the night.

Things to keep in mind

- **Goal:** Your goal by the end of the class is to maximize your profit.
- **Tax:** All items you sell and buy from each other have 10% tax on top of the label price (not when you buy them from me though).
- **Discounts:** Once you put a price on an item, you can't change it, so be cautious not to over- or under-price your items. However, each group is allowed a maximum of 5 discounts throughout the night. This is just in case after many tries you cannot get a certain item to sell, so you can reduce the price and hopefully that'll help you sell it.
Like the price labels, you also get the discount labels from me.
- Once you buy an item, it's yours, you can do whatever you want with it – you can choose to keep it or sell it.

- You don't want to make your items too cheap because then you won't make enough profit once they're sold. But at the same time, you don't want to make anything too expensive because then it won't sell. Remember the other groups only have \$50 to spend on all the businesses.
- You can only sell what you buy, so if you don't buy enough, it's unlikely that you make any sales.
- Also, the warehouse price is most probably lower than that of other businesses.

Before we start the sales, let's do a little bit of a review on a few concepts you need to know.

1 Percentages, Taxes and Discounts

Percentages

When calculating a certain percentage of a number, just multiply it by the decimal form of the percentage. To get the decimal form, divide the percentage by 100 (*ie. move the decimal space 2 spaces to the left*).

For example, 10% of \$20 is just $\frac{10}{100} \times \$20 = 0.1 \times \$20 = \$2$.

There are many ways to approach multiplying a number by a percent without the use of a calculator (which is what we will be doing today).

- If you're multiplying a number by 10%, just 'move over the decimal place' one space to the left.
- If you're multiplying a number by a multiple of 10% (like 20%, or 30% etc.) multiply it by 2, or 3 etc, correspondingly, and then divide it by 10.
- If you're multiplying a number by a multiple of 25%, (so 25%, 50% or 75%), multiply it by $\frac{1}{4}$, $\frac{1}{2}$ or $\frac{3}{4}$ correspondingly.

Taxes

When adding 10% tax to a price, you must multiply it by 1.1, which is equivalent to multiplying it by 0.1 and then adding it to the original price.

For example: Adding 10% tax to an item worth \$2, we would do the following:

$$\$2 \times 1.1 = \$2 \times (1 + 0.1) = (\$2 \times 1) + (\$2 \times 0.1) = \$2 + \$0.2 = \$2.2$$

Discounts

When applying a discount to a price, similar to what we did above, we will multiply the price by $(1 - x)$, where x is the discount in percent.

For example: Applying a 20% discount on an item worth \$10, we would do the following:

$$\$10 \times (1 - 0.2) = \$10 \times 0.8 = \$8.$$

2 Income, Expenses and Profit

Remember that the goal of this activity is to maximize your profit. But what does that really mean?

Income is any money recieved, basically your total income is going to be the sum of all the money on your 'sales card'.

Expenses are the cost required for something, which is basically the total amount of money that you spend on buying items tonight, including those items you buy from the warehouse as well as those you buy from the other businesses. This should be a constant \$100 for each group.

Profit (a.k.a. 'Net Income') is equal to your Income minus your Expenses.

What that means for you is that you want to make sure that you don't spend your money on items that you don't think would sell for higher than that price.