

# Selling Your Students on Spreadsheets

An engaging, real-life project for exploring spreadsheets with middle school students



PHOTO BY JOANNE FORTUNATO

*By Joanne Fortunato*

**Subject:** Math, tech ed, art

**Audience:** Teachers, teacher educators

**Technology:** digital camera, scanner, color printer; spreadsheet, drawing, and word processing software

**Grade Level:** 5–8 (Ages 11–14)

**Standards:** *NETS•S* 3, 4, 6; *NETS•T* II ([www.iste.org/standards](http://www.iste.org/standards))

**Supplement:** [www.iste.org/L&L](http://www.iste.org/L&L)

*Students work in teams to create a product to sell.*

Spreadsheets can lend themselves to real-life experiences in unique ways. When most people think about spreadsheets, their first thought is boring number crunching. However, spreadsheets can be stimulating and fun for students when they are given an exciting, meaningful reason to crunch numbers. I wanted to help students understand the power and value of spreadsheets as a “what if” tool in the business world.

To simulate a real business, I wanted students to create and sell a product. But what product could students realis-

tically create and sell? One day at my local office supply store, I discovered an incredible selection of papers for inkjet printers, such as magnetic, decal, bumper sticker, and variety stickers. Once I discovered the paper, I immediately thought of numerous products students would enjoy creating, such as refrigerator magnets, bumper stickers, and window decals.

But how could we fund this project given that there was no money in the school budget for such an endeavor? Specialty inkjet paper is expensive. The average specialty paper costs about \$10



a package and comes in packages of four to six sheets. Then I realized that if students are actually designing and selling products for a profit, funding this project was not an issue. I would buy all the supplies for this project using school purchase orders. By the time the money was due for the supplies, students would earn enough to pay the bill for the supplies they used and have enough left over to use for other purposes. (The students decided to use the profits to buy a new color inkjet printer for the lab. Although this was not originally the goal of the project, it was a

wonderful unexpected benefit. It also made up for the wear and tear on the existing lab printer.)

### Starting the Project

For the first step, students were taught basic spreadsheet skills. After that lesson, they created their own spreadsheets to determine how much it would cost to make a product using specialty inkjet paper. Then using the spreadsheets they created as a guide, students designed and marketed real products. The thought of actually making and selling the product motivated the students to play “what if” with the spreadsheet they created. I noticed that as students discussed their plans for the design and sale of their product, they were engaged in this process on many levels. They discussed everything from popular culture and what would sell to the size of the product and how much profit they could make on each item.

Although the main goal of this project was to teach students how spreadsheets are used to determine profit and loss, this project offered many other educational opportunities that allowed me to integrate a variety of other curricula, such as art and language arts. Students used PowerPoint to design and produce their products, but nearly any painting or drawing tool would work as well. They also used Word to create order forms to help sell and deliver the items they created. Students used poster board and a combination of computer art and original art to make ads to help promote sales. (See Copyright Concerns on p. 30.)

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### Teaching Basic Spreadsheet Skills

If your students are learning about spreadsheets for the first time, you will need to spend approximately three 45-minute periods teaching them basic spreadsheet skills. The part of the unit that introduced basic spreadsheet concepts followed a specific sequence.

First, students gained experience using an existing spreadsheet. This provided them with fundamental spreadsheet skills and a comfort level with spreadsheets. For example, in the first lesson, students used an existing spreadsheet about a lemonade stand. They were asked a series of questions about the spreadsheet to make sure they understood basic concepts.

Next, students worked with a partially completed spreadsheet to learn how to add information to an existing file. Once again, students were given an existing spreadsheet; but this time, they had to add formulas and other information. The lessons used in both of these sections of this project are from my book *Building Technology Skills: A Middle School Portfolio Program* (Fortunato & Humphrey, 1996).

Finally, students created their own spreadsheet for a product that would be made from specialty inkjet paper. I spent two class periods teaching this segment of the project. In this part of the unit, students were given a handout with the labels of the spreadsheet so that all the students' spreadsheets had some degree of consistency (Figure 1). Students were required to start a spreadsheet from scratch and type in the labels they were given on the hand-

	A	B	C	D
9	<b>Profit Analysis</b>			
10	<b>Your Cost per item</b>	<b>Price Sold at:</b>	<b>Profit per item</b>	<b>Number Sold</b>
11	formula	formula	formula	formula
12				
13	<b>Total Expenses</b>	<b>Total Collected</b>	<b>Total Profit</b>	
14	formula	formula	formula	
15				
16	<b>Expenses</b>			
17	<b>Price/Package Paper</b>	<i>given</i>	<b>Camera/Scanner Picture</b>	\$ 0.05
18	<b># of Sheets/Package</b>	<i>given</i>	<b>Total cost of pictures</b>	<i>formula</i>
19	<b>Cost/Sheet</b>	formula	<b>One Time Ad Fee</b>	\$ 2.00
20	<b>Ink/Sheet</b>	\$ 0.50		
21	<b># of Products/Sheet</b>	Team Decision	<b>Total Additional Expenses</b>	formula
22				
23	<b>Basic Cost/Product</b>	formula		
24	<b>Additional Cost/Product</b>	formula		
25	<b>Total Cost/Product</b>	formula		
26				
27	<b>Sales</b>			
28	<b># sold</b>			
29	<b># Pictures Needed</b>	Team Decision		
30	<b>Price of your product</b>	Team Decision		
31				
32				
33	<b>Paper</b>	<b>Cost/Package</b>	<b>Sheets/Package</b>	
34	Magnetic	\$ 12.00	5	
35	Decal	\$ 10.50	6	
36	Bumper Sticker	\$ 10.00	6	
37				

Figure 1. A section of the spreadsheet students used to find costs and set profitable prices



Samples of student projects.

out. Then, students were responsible for putting in the formulas and adding any other labels they felt they needed.

Students were given some parameters to help with the design and marketing of their product. The limit that students could charge for a product was set between \$.50 and \$2. I came up with these figures based on the fact that students could realistically create between four and six items on a page. At \$2 per sheet of specialty paper, less than \$.50 per item would not be enough for students to make a profit. I set the maximum at \$2 because I did not think students would pay more than that for an item. Also, I did not want students dealing with large amounts of money. Students were required to make at least \$.25 per product to make it worth creating and selling.

In addition, a charge of \$.50 per page for ink and \$.05 per digital or scanned picture was built into the spreadsheet. These figures were added in for a token amount so that the project was more realistic. In the business world, all materials have some cost, and I wanted students to understand that concept. Students also had to pay a \$2 fee if they wanted supplies for advertising. This was set as a standard one-time fee to simplify the spreadsheet, as it was already developmentally and educationally as complicated as it should be for middle school students. Students were limited to creating five posters for their one time fee of \$2.

Name \_\_\_\_\_ Section \_\_\_\_\_

**Product Spreadsheet Questionnaire**

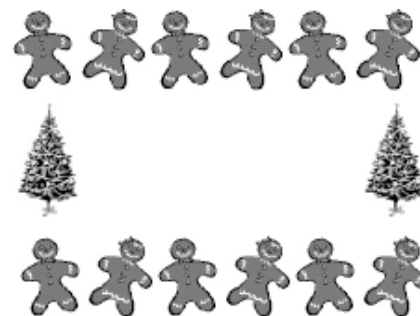
The team is selling magnets. They have decided to print 6 magnets on each page. They are not going to take any digital pictures with the camera and they decide to spend the \$2.00 and advertise. The team sells 20 magnets.

- How much did it cost for the team to make each magnet? \_\_\_\_\_
- How much profit will the team make on each magnet they sell it for \$1.50 per magnet?  
\_\_\_\_\_
- What is the minimum number of magnets the team has to sell to make a profit of a \$50.00? (the profit will actually be a little more than \$50.00 - it is impossible in this scenario to make exactly \$50.00)  
\_\_\_\_\_
- The team has changed plans and decides to let 10 customers have pictures from the camera. How much is their total profit? (keep all the current information in place - do not change the number sold or the price they plan to charge)  
\_\_\_\_\_

Figure 2. The questions from one of the student scenarios. (Find other scenarios at [www.iste.org/L&L/](http://www.iste.org/L&L/))

### Copyright Concerns

Although it is easy to use the Internet to get graphics and pictures for the products, there are copyright issues with using graphics from the Web. I had to ensure that the pictures students used were not copyright protected. It's better to encourage students to create original artwork. A digital camera and/or a scanner can solve some of the copyright issues. For example, many students, teachers, and staff wanted magnets of their friends or families for their lockers and/or their refrigerators. Some students scanned family photographs from home and others took pictures with the digital camera, eliminating copyright issues. In addition, some students made decals with school slogans or team names.



### Motivating Students to Use Spreadsheets

Once students completed their spreadsheet, they were given a questionnaire with four scenarios similar to what was going to be expected of them when they made and sold their products. The scenario was completed in one class period. (Figure 2 shows one scenario. Find the complete questionnaire in the article supplement at [www.iste.org/L&L/](http://www.iste.org/L&L/).) They had to test their spreadsheets by plugging in the numbers from the scenarios. This gave them an opportunity to make sure their spreadsheets worked. It also gave me a way to measure students' understanding of spreadsheet concepts. Students were not allowed to create and sell a product until they successfully completed this section of the lesson.

Then, it was time to begin creating a product to sell. Students worked in teams of two or three. Each team had to choose a specialty paper for their product from the following choices: magnetic, decal, and bumper sticker. These three types of paper are the easiest and most flexible to use. They can be used with any drawing or painting program because the paper is standard sized (8.5" × 11") and doesn't require special software for layout or printing.

They used the spreadsheet to determine how many products to put on a page. Students quickly discovered that if they only put one or two products on a page, they would have to charge a high price to make a profit. Students thought the high price would deter sales. They also discovered that though

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they could make more money with smaller products, they thought other students would feel "ripped off." So the first step was finding the balance between product size and profitability. Once the size was determined, students had to make a sample product for me to approve. I allowed my students two class periods to plan and create a sample product.

### Selling the Product

Students created order forms in Microsoft Word. They had to make sure their product samples were labeled and that the order form corresponded to the labels. The printer samples were on plain paper to avoid wasting the specialty paper. They also provided a space on their order form to check off when products were completed and delivered.

Students were only allowed to sell during lunch. They were clearly told to take orders only from customers who paid in advance. Students were prohibited from selling to anyone outside the school, except for immediate family. The limit was three lunch periods. Once the time limit was up, students had to fill orders.

With only one color printer in the lab, the logistics of filling the orders were tricky. I recommend you start another lesson once the orders have been taken, because with the exception of printing and cutting products, this

project is complete. Then, some students can print and cut orders while the rest of the class works on the next assignment. That way, it was possible to rotate all groups through and have the products printed in a short period of time. Students delivered the products during lunch and/or homeroom.

### Conclusion

This experience was rewarding and positive for students. They enjoyed using spreadsheets for an authentic purpose. The unexpected benefits from this project made the effort worthwhile. Students were so excited about creating a real product that many of them worked above and beyond class time. Now, when students come to the computer lab and see the new color printer, they are reminded of how their hard work paid off.

### Reference

Fortunato, J., & Humphrey, K. (1996). *Building technology skills: A middle school portfolio program*. Portland, ME: J. Weston Walch.



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## Product Spreadsheet Questionnaire

### *Scenario #1 — questions 1 - 4*

The team is selling magnets. They have decided to print 6 magnets on each page. They are not going to take any digital pictures with the camera and they decide to spend the \$2.00 and advertise. The team sells 20 magnets.

1. How much did it cost for the team to make each magnet? \_\_\_\_\_
2. How much profit will the team make on each magnet they sell it for \$1.50 per magnet?  
\_\_\_\_\_
3. What is the minimum number of magnets the team has to sell to make a profit of a \$50.00? (the profit will actually be a little more than \$50.00 - it is impossible in this scenario to make exactly \$50.00)  
\_\_\_\_\_
4. The team has changed plans and decides to let 10 customers have pictures from the camera. How much is their total profit? (keep all the current information in place — do not change the number sold or the price they plan to charge)  
\_\_\_\_\_

### *Scenario #2 — questions 5 — 8*

The team has decided to make decals. The plan is to print 3 on each page. The team decides that decals will be so popular that there is no need to advertise. The team also decides that digital pictures would be a waste of time. The team sells 15 decals.

5. How much did it cost for them to make each decal? \_\_\_\_\_
6. What does the team need to charge for each decal to make a *profit* equal the cost making the decal?  
\_\_\_\_\_
7. If the team is able to sell 30 decals at the current value, how much is their total profit?  
\_\_\_\_\_
8. The team decides to put 4 decals on a page instead of 3 — Did the profit go up or down and by how much?  
\_\_\_\_\_

### *Scenario 3 — questions 9 — 12*

The team plans to do all sport team logo stickers and let the customer order the team logo of his/her choice. The plan is to print 9 on each page. The team decides they will have to advertise to beat the competition. They don't need to take pictures, the logos will be taken from the Internet. They decide that the stickers will sell better if they can be removed and reused. The team sells 15 stickers.

9. How much did it cost for the team to make each sticker? \_\_\_\_\_

10. How much profit will the team make if they charge \$1.25 for each sticker?

\_\_\_\_\_

11. The team realizes that these stickers are popular. They are able to sell 10 more stickers for \$1.50. How much additional profit do they make?

\_\_\_\_\_

12. The team's goal was to earn at least \$20.00 profit, what would they need to do to achieve that goal? Be specific and creative in your response — just writing sell more stickers is not an acceptable answer.

\_\_\_\_\_

### *Scenario 4 — questions 13 - 16*

This team decides to make tattoos. They plan to sell rows of 5 tattoos. They can only fit 4 rows per sheet. They decide to advertise, but they can't take pictures, the tattoos are way too small for this. They are able to sell 18 sets of tattoos

13. How much did it cost for the team to make each row of tattoos?

\_\_\_\_\_

14. How much profit will the team make if they charge \$1.30 per set of tattoos?

\_\_\_\_\_

15. What is the most the team would be able to make if they charge \$1.50 for the tattoos? Remember each team is only allowed to use 3 packages of their chosen paper.

\_\_\_\_\_

16. The tattoos are very popular. The team is able to sell 15 more tattoos at \$1.75 per set. What is their total profit including the 18 they sold before they raised the price?

\_\_\_\_\_