

# A STOCKMARKET SPREADSHEET FOR TEACHING PERCENT APPLICATIONS

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Recently, mathematics teachers began to explore the teaching potential of computer spreadsheets (Dubitsky, 1989). Spreadsheets can be used to manage budgets; for example, to monitor a class sales campaign. Another example of data management is provided by Bright (1989), who described how spreadsheet formulas could be created to assist students to become better estimators of linear measurements.

Computer created spreadsheets can also help middle school students to investigate ratio and percent topics. Students can select a small number of stocks and monitor their investment progress (see Figure 1). Appleworks has provided the software for this spreadsheet.

	A	B	C	D	E	F	G
	<u>Company</u>	<u>No. of Shares</u>	<u>Purchase Price</u>	<u>Total Cost</u>	<u>Current Price</u>	<u>Current Value</u>	<u>Pct of Purchase Price</u>
7	McDonalds	100	\$29.25	\$2925.00	\$30.75	\$3075.00	5.13%
9	Disney	50	\$93.00	\$4650.00	\$112.00	\$5600.00	20.43%
11	Boston Celtics	100	\$14.00	\$1400.00	\$12.00	\$1200.00	-14.29%
13	Ford	75	\$48.75	\$3656.25	\$55.00	\$4125.00	12.82%
15	Tandy	50	\$45.00	\$2250.00	\$82.00	\$4100.00	82.22%
17			Total Cost	\$14881.35	Total Current Value	\$18100.00	

Figure 1

Entries can be made in columns A, B, C, and E while others are generated by the formulas shown in Figure 2.

	A	B	C	D	E	F	G
	<u>Company</u>	<u>No. of Shares</u>	<u>Purchase Price</u>	<u>Total Cost</u>	<u>Current Price</u>	<u>Current Value</u>	<u>Pct of Purchase Price</u>
7	McDonalds	100	\$29.25	+B7*C7	\$30.75	+B7*B7	(E7-C7)/C7
9	Disney	50	\$93.00	+B9*C9	\$112.00	+B9*B9	(E9-C9)/C9
11	Boston Celtics	100	\$14.00	+B11*C11	\$12.00	+B11*B11	(E11-C11)/C11
13	Ford	75	\$48.75	+B13*C13	\$55.00	+B13*B13	(E13-C13)/C13
15	Tandy	50	\$45.00	+B15*C15	\$82.00	+B15*B15	(E15-C15)/C15
17			Total Cost	©SUM(D7..D15)	Total Current Value	©SUM(F7..F15)	

Figure 2

Rapid calculations are done simultaneously in columns D, F, and G. Students may estimate the new entries in columns F and G which occur as a result of varying the current price entered in column E. They can then see how well they estimated.

Let's develop some "what if" situations to show how students can use this spreadsheet to estimate percents. For example, suppose McDonald's current price is \$55. What percent of increase from the purchase price occurred? A student might reason that a price of \$55 is almost double the purchase price of \$29.95. A percent increase of about 90% might be estimated. Entering \$55 for the current price yields a percent gain of 88.03%. (Figure 3 focuses on the result.)

	A	B	C	D	E	F	G
	<u>Company</u>	<u>No. of Shares</u>	<u>Purchase Price</u>	<u>Total Cost</u>	<u>Current Price</u>	<u>Current Value</u>	<u>Pct of Purchase Price</u>
7	McDonalds	100	\$29.25	\$2925.00	\$55.00	\$5500.00	88.03%

Figure 3

Another estimation or "what if" question might be to consider the following: in order to obtain a 15% gain from the purchase price, what current value would each of your stocks need to reach? Taking McDonald's as an object lesson for reasoning, a student might say that McDonald's purchase price was about \$30. So, \$3 is 1/10 or 10% of 30 and \$1.50 is thus 5%. Therefore, \$4.50 as an increment would give us \$34.50 as a target for a 15% gain. We can then play around with various entries close to \$34.50 until the spreadsheet results yield a 15% gain. Figure 4 shows the results for all five of our stocks.

	A	B	C	D	E	F	G
	<u>Company</u>	<u>No. of Shares</u>	<u>Purchase Price</u>	<u>Total Cost</u>	<u>Current Price</u>	<u>Current Value</u>	<u>Pct of Purchase Price</u>
7	McDonalds	100	\$29.25	\$2925.00	\$33.65	\$3365.00	15.04%
9	Disney	50	\$93.00	\$4650.00	\$107.00	\$5350.00	15.05%
11	Boston Celtics	100	\$14.00	\$1400.00	\$16.10	\$1610.00	15.00%
13	Ford	75	\$48.75	\$3656.25	\$56.10	\$4207.50	15.08%
15	Tandy	50	\$45.00	\$2250.00	\$51.75	\$2587.50	15.00%
17			Total		Total		
18			Cost	\$14881.35	Current	\$17120.00	
19					Value		
20	(Less Tax and Commissions)						

Figure 4

There are several other "what if" questions which induce students to estimate ratio and percents and check by making entries into the spreadsheet. Some of these are the following:

1. Suppose all your stocks tripled in price. What would be your percent of increase? Discuss whether you would sell or hold the stock.
2. What if Disney fell 24 points from its purchase price? Estimate the percent loss then use the spreadsheet program to check your estimate. What news event might influence a drop such as this?

3. Suppose each of your stocks shows a 30% loss from the purchase price. Estimate what each of the stock's price is. Now use your spreadsheet program to check your estimate. Play with the spreadsheet program until your entries yield a 30% loss.

Computer spreadsheets have profoundly affected business, particularly accounting and brokerage firms. Growth of software to manage investments to perform bookkeeping functions and to control budgets and payrolls has been phenomenal. Having students use a spreadsheet such as this gives them a mathematical connection to real world work. Also, estimation and number sense experiences can be enhanced for percent concepts.

#### References

- Aron, A., and E. Aron. *Using Appleworks*. Indianapolis, IN: Que, 1987.
- Bright, G. "Teaching Mathematics with Technology: Mathematics and Spreadsheets." *Arithmetic Teacher* 36(April 1989), 52-53.
- Dubitsky, B. "Making Division Meaningful with a Spreadsheet." *Arithmetic Teacher* 36(November 1988), 21.
- Luehrman, A., and H. Peckman. *Computer Applications: A Hands On Approach*. New York, NY: McGraw-Hill, 1986.
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A school should be the most beautiful place in every town and village – so beautiful that the punishment for undutiful children should be that they should be debarred from going to school the following day.

Oscar Wilde  
(In Conversation)  
*The Wit and Humor  
of Oscar Wilde*  
Dover Publications, Inc.  
New York, 1959, p. 159