

# MATH BEHIND THE MARKET

## Teaching Tools for The Stock Market Game

Curriculum Developers:

Hilary Hunt  
Educational Program Consultant  
Camp Hill, PA

Thomas D. Anderson  
Mathematics Education Consultant  
Pottstown, PA

Funded by The McGraw-Hill Companies  
Produced by The Stock Market Game Program



*The McGraw-Hill Companies*



# Math Behind the Market

## UNIT TWO:

### Single Step Problem Solving

INTRODUCTION.....	5
ACTIVITIES.....	5
CORRELATION TO MATH CONCEPTS.....	6
CORRELATION TO SMG CONCEPTS.....	7
CORRELATION TO CONNECTIONS AND EXTENSIONS.....	8
UNIT 2: SINGLE-STEP PROBLEM SOLVING.....	9
UNIT FOCUS.....	9
UNIT CONTENTS.....	9
ACTIVITY 2A: ADD 'EM UP.....	9
Description.....	9
Math Objectives.....	9
SMG Concepts.....	9
Connections and Extensions.....	9
ACTIVITY 2B: WHAT'S THE DIFFERENCE?.....	10
Description.....	10
Math Objectives.....	10
SMG Concepts.....	10
Connections and Extensions.....	10
ACTIVITY 2C: CHANGES AND MORE.....	10
Description.....	10
Math Objectives.....	10
SMG Concepts.....	10
Connections and Extensions.....	10
ACTIVITY 2D: CHANGES AND MORE - FIGURE IT OUT!.....	11
Description.....	11
Math Objectives.....	11
SMG Concepts.....	11
Connections and Extensions.....	11
ACTIVITY 2E: DIVIDEND HAPPY.....	11
Description.....	11
Math Objectives.....	11
SMG Concepts.....	11
Connections and Extensions.....	11
ACTIVITY 2F: BIG, BIG NUMBERS.....	12
Description.....	12
Math Objectives.....	12
SMG Concepts.....	12
Connections and Extensions.....	12
ACTIVITY 2G: CURRENCY CONVERSIONS.....	13
Description.....	13
Math Objectives.....	13
SMG Concepts.....	13
Connections and Extensions.....	13
ACTIVITY 2A: ADD 'EM UP.....	15
ACTIVITY 2A: ADD 'EM UP (ANSWER KEY).....	16
ACTIVITY 2B: WHAT'S THE DIFFERENCE?.....	17
ACTIVITY 2B: WHAT'S THE DIFFERENCE? (ANSWER KEY).....	18
ACTIVITY 2C: CHANGES AND MORE.....	19

ACTIVITY 2C: CHANGES AND MORE (ANSWER KEY).....	20
ACTIVITY 2D: CHANGES AND MORE - FIGURE IT OUT! .....	21
ACTIVITY 2E: DIVIDEND HAPPY .....	22
ACTIVITY 2E: DIVIDEND HAPPY (ANSWER KEY) .....	23
ACTIVITY 2F: BIG, BIG NUMBERS.....	24
ACTIVITY 2F: BIG, BIG NUMBERS (ANSWER KEY) .....	25
ACTIVITY 2G: CURRENCY CONVERSIONS.....	26
ACTIVITY 2G : CURRENCY CONVERSIONS (ANSWER KEY).....	27
<b>APPENDIX A.....</b>	<b>28</b>
<b>APPENDIX B.....</b>	<b>29</b>
<i>Build new mathematical knowledge through problem solving.....</i>	<i>30</i>
<i>Organize and consolidate their mathematical thinking through communication.....</i>	<i>30</i>

# INTRODUCTION

The purpose of *Math Behind the Market* is to provide a tool for teachers to reinforce mathematical concepts using The Stock Market Game™ (SMG) Program. Designed to be flexible and easy to use, this module on *Fractions and Decimals* is divided into two units based on mathematical content:

Unit 1: Comparing, Ordering and Converting Fractions, Mixed Numbers, and Decimals

Unit 2: Single-Step Problem Solving

## ACTIVITIES

The activities may be used separately or together. Each activity allows for flexibility in its use. The following are examples of how to use the activities:

As a Class: The teacher or a student can complete the answers using a transparency.

In a Group: Have students work in cooperative learning groups to complete the activity. The group may or may not be organized according to SMG teams.

On Their Own: Students can complete the activity on their own either in class or as a homework assignment.

Each unit contains specific information on its activities including:

- Description
- Math Objectives
- SMG Concepts
- Connections and Extensions

Definitions of SMG concepts are included in the Glossary at the end of the module. As needed, answer keys are included directly following the corresponding activity. Answer keys are not provided for the *Figure it Out!* activities. Use of a calculator has been left to the teacher's discretion.

Within each unit there is at least one *Figure it Out!* activity. These activities are intended to provide the teacher with maximum flexibility. The following are examples of how the *Figure it Out!* activities may be used:



As a Class: Find the information needed using a newspaper or the Internet. Complete the activity as a class or assign various groups to complete specific problems or sections.

In a Group: Have teams of students use the information from their SMG portfolio or other stocks of interest to complete the activity.

On Their Own: Have students select the stocks or other information needed based on their interests or ones they have researched for SMG.

If the class is not actively making trades in their SMG portfolios, another option is to assign a stock category to each team. For example, the teacher may assign one group to use information from "NASDAQ companies only" while another group may have a "technology companies only" assignment. Other categories may include:

- NYSE companies
- Companies that make foods or drinks we like
- Companies on the Dow Jones Industrial Average
- Local companies

Let your creativity inspire you or allow students to determine their own list of categories.

# CORRELATION TO MATH CONCEPTS

	Unit 1									Unit 2							
Math Concepts	A	B	C	D	E	F	G	H	I	A	B	C	D	E	F	G	
Decimals:																	
• Add										❖							
• Compare		❖		❖		❖	❖						❖				
• Convert								❖	❖								
• Divide															❖	❖	
• Multiply														❖	❖	❖	
• Number Line			❖		❖												
• Order		❖	❖	❖	❖	❖	❖										
• Integers		❖	❖	❖	❖												
• Rounding								❖	❖						❖	❖	
• Subtract											❖	❖	❖				
Fractions:																	
• Compare	❖						❖										
• Convert								❖	❖								
• Mixed Numbers							❖		❖								
• Number Line	❖																
• Order	❖						❖										
Problem Solving:																	
• Solve Word Problems										❖		❖	❖	❖		❖	
• Use Formulas														❖	❖	❖	
• Write Word Problems														❖			
• Tables																	
• Complete				❖	❖								❖				
• Interpret	❖	❖	❖	❖	❖								❖		❖		
• Writing Mathematically		❖		❖			❖					❖		❖			
<b>Math Concepts</b>	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>	<b>G</b>	<b>H</b>	<b>I</b>	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>	<b>G</b>	
	Unit 1									Unit 2							

# CORRELATION TO SMG CONCEPTS

SMG Concepts	Unit 1									Unit 2						
	A	B	C	D	E	F	G	H	I	A	B	C	D	E	F	G
52-Week Highs and Lows		❖	❖	❖	❖						❖	❖	❖			
Annual Earnings															❖	
Basic Cost																
Broker's Fee																
Daily Highs and Lows											❖					
Decimalization						❖	❖									
Dividends		❖	❖	❖	❖									❖		
Earnings per Share															❖	
Equity																
Foreign Currency																❖
Gains & Losses																
Long Positions																
Market Capitalization															❖	
Net Change (Daily)	❖	❖	❖	❖	❖			❖				❖				
Net Cost																
P/E		❖	❖	❖	❖											
Shares Outstanding															❖	
Short Positions																
Stock Prices		❖	❖	❖	❖	❖	❖		❖	❖		❖	❖		❖	❖
Unrealized Gains & Losses																
Volume		❖		❖	❖											
Yield		❖	❖	❖	❖											
<b>SMG Concepts</b>	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>	<b>G</b>	<b>H</b>	<b>I</b>	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>	<b>G</b>
	Unit 1									Unit 2						

# CORRELATION TO CONNECTIONS AND EXTENSIONS

	Unit 1									Unit 2						
<b>Connections and Extensions</b>	A	B	C	D	E	F	G	H	I	A	B	C	D	E	F	G
Creative Writing		1	1	1	1											
Economics																1
Guest Speaker															1	
Math		1	1	1	2		1			1				2	2	2
Personal Finance														1		
Research	2	1	1	1	1		1									2
SMG	1							1					1	1	2	2
Technology																1
Writing	1		1		1	1	1		1	1	2	5	1	1	2	
<b>SMG Concepts</b>	A	B	C	D	E	F	G	H	I	A	B	C	D	E	F	G
	Unit 1									Unit 2						

# UNIT 2: SINGLE-STEP PROBLEM SOLVING

## UNIT FOCUS

This Unit provides activities for use in adding, subtracting, and multiplying decimals.

## UNIT CONTENTS

- 2A *Add 'Em Up* (Adding Decimals)
- 2B *What's the Difference?* (Subtracting Decimals)
- 2C *Changes and More* (Adding & Subtracting Decimals)
- 2D *Changes and More - Figure it Out!* (Subtracting Decimals)
- 2E *Dividend Happy* (Multiplying Decimals)
- 2F *Big, Big Numbers* (Multiplying & Dividing Decimals)
- 2G *Currency Conversions* (Multiplying Decimals)

## ACTIVITY 2A: ADD 'EM UP

### Description

Students determine the total value of stocks in a portfolio given the value of their holdings in individual stocks.

### Math Objectives

The student will be able to:

- Find the sum of numbers in decimal form
- Solve word problems
- Distinguish between relevant and irrelevant information in a mathematical problem

### SMG Concepts

Stock Prices

### Connections and Extensions

**Math:** Students write additional word problems using a similar format as those in the activity. Students create a separate answer key with the problem worked out in full. Students trade problems and solve their partner's problem. Students correct the work of their partner.

**Writing:** Students write a short letter to a friend who has not studied decimal addition and explains how to perform the operation.

## ACTIVITY 2B: WHAT'S THE DIFFERENCE?

### Description

Students determine the difference between 52-week highs/lows and daily highs/lows.

### Math Objectives

The student will be able to:

- Find the difference between two numbers in decimal form

### SMG Concepts

52-Week High and Low  
Daily High and Low

### Connections and Extensions

**Writing:** Students respond to the prompt, "Why is it important for an investor to know the difference between a stock's 52-week and low or daily high and low?"

**Writing:** Students respond to the prompt, "What other differences or ranges might an investor wish to know?"

## ACTIVITY 2C: CHANGES AND MORE

### Description

Students determine closing prices, daily net changes, and difference between current price and 52-week highs/lows by subtracting various values.

### Math Objectives

The student will be able to:

- Find the difference between two numbers in decimal form
- Solve word problems

### SMG Concepts

52-Week High and Low  
Net Change  
Stock Prices

### Connections and Extensions

**Writing:** Students respond to the prompt, "Which of the three stocks would you rather include in your portfolio? Justify your response mathematically."

Students respond to the prompt, "Why is it important to know how the current price of a stock relates to its 52-week high or 52-week low?"

Students respond to the prompt, "Why does the range between the 52-week high and the 52-week low vary from stock to stock?"

Students respond to the prompt, "Would you rather buy a stock when its price is near the 52-week high or the 52-week low? Why?"

Students respond to the prompt, "There is a popular investment slogan: *Buy Low ~ Sell High*. How does finding the difference between a stock's current price and its 52-week high and 52-week low apply to this saying?"

## **ACTIVITY 2D: CHANGES AND MORE - FIGURE IT OUT!**

### **Description**

Students collect information for three stocks of their choosing, complete a table with their data, and determine the difference between current prices and 52-week highs and lows.

### **Math Objectives**

The student will be able to:

- Find the difference between two numbers in decimal form
- Solve word problems
- Determine the least and greatest value in an answer set

### **SMG Concepts**

52-Week High and Low  
Stock Prices

### **Connections and Extensions**

**SMG:** This activity can be used during the process of selecting stocks for SMG in coordination with a lesson on "Buying Low and Selling High."

**Writing:** See suggestions for Activity 2C.

## **ACTIVITY 2E: DIVIDEND HAPPY**

### **Description**

Students calculate dividend payments given the number of shares and the dividend amount per share. Students write two problems of their own.

### **Math Objectives**

The student will be able to:

- Multiply a decimal by a whole number
- Use a formula to solve a problem
- Write word problems
- Round decimals to the nearest hundredth

### **SMG Concepts**

Dividends

### **Connections and Extensions**

**Math:** Students write their own problems involving dividends and exchange with a classmate. Students work and then check each other's problems.

**Math/Personal Finance:** Students write checks to the person named in the problems for the amount of the dividend payment using the sample checks provided in the Appendix.

**Writing:** Students respond to the prompt, "Would you rather invest in a company that regularly pays dividends? Why or why not?"

**SMG:** Reinforce the concept of dividends using "Declaring Dividends" (*In The News*, Volume 21, Issue 1)

## **ACTIVITY 2F: BIG, BIG NUMBERS**

### **Description**

Students use current price, number of shares outstanding, and latest annual earning to calculate earnings per share and market capitalization.

### **Math Objectives**

The student will be able to:

- Divide two numbers and get a decimal answer
- Multiply a whole number by a decimal
- Use a formula to solve a problem
- Round decimals to the nearest hundredth
- Interpret and apply information from a table

### **SMG Concepts**

Annual Earnings  
Earnings per Share  
Market Capitalization  
Shares Outstanding  
Stock Prices

### **Connections and Extensions**

**Math:** Students express Number of Shares Outstanding, Latest Annual Earnings, and Market Cap in expanded form and scientific notation.

Students read answers for Market Capitalization aloud.

**Writing:** Students respond to the prompt, "When researching a stock would you rather invest in a company with a high or low EPS? Why?"

Students respond to the prompt, "If a company loses money, how will that effect the EPS? Explain your answer in a paragraph."

**Guest Speaker:** Invite a stockbroker to visit the class and share additional information about Earnings per Share and Market Capitalization.

**SMG:** Students classify the companies using their market capitalization values as large, middle, or small cap using the following classifications:

Small Cap = 250 million - 1 billion  
Mid Cap = 1 billion - 5 billion  
Large Cap = 5 billion - 25 billion (and up)

Reinforce the concept of market capitalization using "Market Capitalization" (*Market Mentor*, Issue 8, Spring 2001)

## ACTIVITY 2G: CURRENCY CONVERSIONS

### Description

Students convert the prices of stocks to foreign currency.

### Math Objectives

The student will be able to:

- Multiply decimals
- Use a formula to solve a problem
- Solve word problems

### SMG Concepts

Foreign Currency

Stock Prices

### Connections and Extensions

**Math:** Students determine the formula for the reverse operation: converting a foreign currency into American dollars.

Students use current exchange rates to determine current values.

**Economics:** Divide the class into groups of 2-3 students each. Assign each group to represent a country (one should represent the United States). Groups decorate a "booth" (table or desk) with symbols of their assigned country. Decorations might include a flag, sign with country name, etc. Each group will research the current exchange rate for their country's currency and design play money for the currency. Conduct a simulation in which students visit the exchange booths of other countries and exchange currency. Students should keep records of their exchanges showing the calculations needed for each. Conclude with students writing about which transactions were easiest and which were the most difficult.

**Research:** Students research the European Union. Questions to consider: Which countries are members? Why and how was it created? How is it governed? How has the European Union affected each of its members' currencies and economies? How does the European Union compare with the United States economically?

Students locate current exchange rates in the newspaper or online.

**SMG:** Students convert values from their SMG portfolio to foreign currencies.

Introduce the concept of Overseas Markets and their influences on U.S. investors using "Effects of Overseas Market on U.S. Investors" (*Market Mentor*, Issue 6, Spring 2001).

**Technology:** Students create a spreadsheet that converts a stock price into other currencies.





## ACTIVITY 2A: ADD 'EM UP (ANSWER KEY)

Solve each of the following problems. Show your work in the space provided or on a separate sheet of paper. Circle your final answer.

1. Keri has three stocks in her portfolio. The value of her technology company stock is \$3,412.72. Her utility company stock is worth \$1,208.26, while her publishing company is valued at only \$763.31. What is the total value of her three stocks?

Answer: \$5,384.29.

2. Jovon wants to invest in four companies. 500 shares of the transportation company he is interested in would cost \$3,526.43. 1250 shares of a cell phone manufacturer would cost \$16,873.76. 805 shares of an electronics manufacturer would cost \$4,721.43. 715 shares of a drug company would cost \$4,301.18. If Jovon purchases all of these stocks, how many shares would he own and what would the total cost be?

Answer: 3,270 shares of stocks with a total cost of \$29,422.80.

3. Sally invested in three companies. She purchased stock in Irish Eyes Are Smiling for \$2,805.00, Tartan Ties for \$1,896.32, and Bagpipes R Us for \$3,217.26. What was the total cost of these investments?

Answer: \$7,918.58.

4. Wade wants to purchase 100 shares of stock in each of three companies that are closely related to his favorite pastime. Motorcycle Mania stock will cost \$736.45. Helmets and More stock will cost \$1,238.84. Riding Gear Incorporated stock will cost \$2,643.56. What will his total investment be?

Answer: \$4,618.85.

## ACTIVITY 2B: WHAT'S THE DIFFERENCE?

Find the difference between each of the 52-Week Highs and Lows.

52-Week High: \$58.04      52-Week Low is \$38.53      Difference: \_\_\_\_\_

52-Week High: \$35.17      52-Week Low is \$21.60      Difference: \_\_\_\_\_

52-Week High: \$37.00      52-Week Low is \$27.85      Difference: \_\_\_\_\_

52-Week High: \$29.48      52-Week Low is \$20.71      Difference: \_\_\_\_\_

52-Week High: \$17.49      52-Week Low is \$8.12      Difference: \_\_\_\_\_

Find the difference between each of the Daily Highs and Daily Lows.

Daily High: \$14.06      Daily Low: \$13.80      Difference: \_\_\_\_\_

Daily High: \$31.27      Daily Low: \$29.88      Difference: \_\_\_\_\_

Daily High: \$47.26      Daily Low: \$43.15      Difference: \_\_\_\_\_

Daily High: \$8.29      Daily Low: \$8.12      Difference: \_\_\_\_\_

Daily High: \$27.32      Daily Low: \$26.35      Difference: \_\_\_\_\_

## ACTIVITY 2B: WHAT'S THE DIFFERENCE? (ANSWER KEY)

Find the difference between each of the 52-Week Highs and Lows.

52-Week High: \$58.04      52-Week Low is \$38.53      Difference: \$19.51

52-Week High: \$35.17      52-Week Low is \$21.60      Difference: \$13.57

52-Week High: \$37.00      52-Week Low is \$27.85      Difference: \$9.15

52-Week High: \$29.48      52-Week Low is \$20.71      Difference: \$8.77

52-Week High: \$17.49      52-Week Low is \$8.12      Difference: \$9.37

Find the difference between each of the Daily Highs and Daily Lows.

Daily High: \$14.06      Daily Low: \$13.80      Difference: \$0.26

Daily High: \$31.27      Daily Low: \$29.88      Difference: \$1.39

Daily High: \$47.26      Daily Low: \$43.15      Difference: \$4.11

Daily High: \$8.29      Daily Low: \$8.12      Difference: \$0.17

Daily High: \$27.32      Daily Low: \$26.35      Difference: \$0.97

## ACTIVITY 2C: CHANGES AND MORE

Solve each of the following problems. Show your work in the space provided or on a separate sheet of paper. Circle your final answer.

1. Mom's Pie Company (YUMM) started the week with an opening price of \$22.35. It increased in value by \$1.14 on Monday. The price then decreased by \$0.95 on Tuesday.

A) What was the closing price on Monday?

B) What was the closing price on Tuesday?

C) What was the change in price from YUMM's open on Monday to its close on Tuesday? Was this an increase or decrease?

2. Old McDonald's Chicken Farm (CLUCK) has been experiencing turbulent times. The stock's 52-week high is \$38.72 while its 52-week low is \$8.88. Yesterday's closing price was \$13.45.

A) What is the difference between the 52-week high and 52-week low?

B) What is the difference between yesterday's close and the 52-week high?

C) What is the difference between yesterday's close and the 52-week low?

3. The price of Santa's Toy Factory (HOHO) stock increased \$2.33 during the week. Its closing price on Friday was \$41.62 and was also the stock's 52-week high. This is \$5.22 higher than its 52-week low.

A) What was the opening price on Monday?

B) What is the stock's 52-week low?

4. On a separate sheet of paper, answer the following question in a complete paragraph. Be sure to justify your response mathematically.

A) Which of these three stocks would you rather include in your portfolio?

## ACTIVITY 2C: CHANGES AND MORE (ANSWER KEY)

Solve each of the following problems. Show your work in the space provided or on a separate sheet of paper. Circle your final answer.

1. Mom's Pie Company (YUMM) started the week with an opening price of \$22.35. It increased in value by \$1.14 on Monday. The price then decreased by \$0.95 on Tuesday.

A) What was the closing price on Monday?

Answer: \$23.39.

B) What was the closing price on Tuesday?

Answer: \$22.54.

C) What was the change in price from YUMM's open on Monday to its close on Tuesday? Was this an increase or decrease?

Answer: Increased by \$0.19.

2. Old McDonald's Chicken Farm (CLUCK) has been experiencing turbulent times. The stock's 52-week high is \$38.72 while its 52-week low is \$8.88. Yesterday's closing price was \$13.45.

A) What is the difference between the 52-week high and 52-week low?

Answer: \$29.84.

B) What is the difference between yesterday's close and the 52-week high?

Answer: \$25.27.

C) What is the difference between yesterday's close and the 52-week low?

Answer: \$4.57.

3. The price of Santa's Toy Factory (HOHO) stock increased \$2.33 during the week. Its closing price on Friday was \$41.62 and was also the stock's 52-week high. This is \$5.22 higher than its 52-week low.

A) What was the opening price on Monday?

Answer: \$39.29.

B) What is the stock's 52-week low?

Answer: \$36.40.

4. On a separate sheet of paper, answer the following question in a complete paragraph. Be sure to justify your response mathematically.

A) Which of these three stocks would you rather include in your portfolio?

ANSWERS WILL VARY

## ACTIVITY 2D: CHANGES AND MORE – FIGURE IT OUT!



Locate the Current Price, 52-Week High, and 52-Week Low for three stocks of your choosing.

Stock Symbol	Current Price	52-Week High	52-Week Low
A.			
B.			
C.			

1. Calculate the difference between the 52-week high and 52-week low for each stock. Circle the largest difference. Put a box around the smallest difference.

Stock A:

Stock B:

Stock C:

2. Calculate the difference between the current price of each stock and its 52-week high.

Stock A:

Stock B:

Stock C:

3. Calculate the difference between the current price of each stock and its 52-week low.

Stock A:

Stock B:

Stock C:

## ACTIVITY 2E: DIVIDEND HAPPY

Companies sometimes share their profits with investors in the form of dividends. Most stock tables will list the amount of a company's dividends. Use the formula below to determine the payment in each situation below.

Dividend Payment = Number of Shares x Dividend Amount per Share

1. Carol has 3,250 shares of a stock that is paying a dividend of \$0.75 per share.
2. Rich owns 1,375 shares of More Money, Inc stock. Their dividend amount per share is \$0.38.
3. Betsy was given 450 shares of a stock paying a dividend of \$1.44 per share.
4. \$0.15 per share is being paid in dividends to owners of Pretty Pens Company (INK). Roberto owns 3,422 shares of INK stock.
5. Snail Landscaping Corp. (SLOW) shareholders are receiving \$0.97 per share in dividends. How much will Sean receive if he owns 980 shares?
6. Heather owns 688 shares of Putter's Golfing Equipment (PAR) stock. PAR is paying dividends of \$0.74 per share.
7. Ashley just learned that School Supplies, Inc. is paying a dividend of \$0.26 per share. She owns 2,185 shares. How much will her dividend payment total?
8. United Bubblegum Company is paying dividends of \$1.27 per share. If you owned 350 shares, how much will your dividend payment total?
9. Write two dividend word problems. Include the complete solution.

## ACTIVITY 2E: DIVIDEND HAPPY (ANSWER KEY)

Companies sometimes share their profits with investors in the form of dividends. Most stock tables will list the amount of a company's dividends. Use the formula below to determine the payment in each situation below.

Dividend Payment = Number of Shares x Dividend Amount per Share

1. Carol has 3,250 shares of a stock that is paying a dividend of \$0.75 per share.  
Answer: \$2,437.50
2. Rich owns 1,375 shares of More Money, Inc stock. Their dividend amount per share is \$0.38.  
Answer: \$522.50
3. Betsy was given 450 shares of a stock paying a dividend of \$1.44 per share.  
Answer: \$648.00
4. \$0.15 per share is being paid in dividends to owners of Pretty Pens Company (INK). Roberto owns 3,422 shares of INK stock.  
Answer: \$513.30
5. Snail Landscaping Corp. (SLOW) shareholders are receiving \$0.97 per share in dividends. How much will Sean receive if he owns 980 shares?  
Answer: \$950.60
6. Heather owns 688 shares of Putter's Golfing Equipment (PAR) stock. PAR is paying dividends of \$0.74 per share.  
Answer: \$509.12
7. Ashley just learned that School Supplies, Inc. is paying a dividend of \$0.26 per share. She owns 2,185 shares. How much will her dividend payment total?  
Answer: \$568.10
8. United Bubblegum Company is paying dividends of \$1.27 per share. If you owned 350 shares, how much will your dividend payment total?  
Answer: \$444.50
9. Write two dividend word problems. Include the complete solution.  
ANSWERS WILL VARY

## ACTIVITY 2F: BIG, BIG NUMBERS

Detailed stock quotes provide more information about a stock than the newspaper. Earnings per share (EPS) is a company's total profit or earnings divided by the number of shares outstanding. Market capitalization (Market Cap) is the current market value of all outstanding shares of the company. It is calculated by multiplying the stock's current price by the number of shares outstanding.

Use the following formulas to find the EPS and Market Cap of each stock. Round answers to the nearest cent or hundredth. Complete the table with your answers. Show your work on a separate sheet of paper.

Earnings per Share = Latest Annual Earnings ÷ Number of Shares Outstanding

Market Cap = Number of Shares Outstanding x Current Stock Price

*Hint:* Convert large numbers into expanded format (1.2 million = 1,200,000) before performing the calculations.

	Number of Shares Outstanding	Current Price	Latest Annual Earnings	Earnings per Share	Market Cap
1	\$8.4 million	\$32.41	\$12.4 million		
2	\$78 million	\$21.65	\$66.3 million		
3	\$2 billion	\$18.26	\$603 million		
4	\$371 million	\$9.77	\$89 million		
5	\$471.2 million	\$16.34	\$735 million		
6	\$150 million	\$33.52	\$306 million		
7	\$52 million	\$26.78	\$92 million		
8	\$564 million	\$8.07	\$676.8 million		
9	\$90 million	\$10.19	\$32.4 million		
10	\$821 million	\$19.23	\$525.4 million		

## ACTIVITY 2F: BIG, BIG NUMBERS (ANSWER KEY)

Detailed stock quotes provide more information about a stock than the newspaper. Earnings per share (EPS) is a company's total profit or earnings divided by the number of shares outstanding. Market capitalization (Market Cap) is the current market value of all outstanding shares of the company. It is calculated by multiplying the stock's current price by the number of shares outstanding.

Use the following formulas to find the EPS and Market Cap of each stock. Round answers to the nearest cent or hundredth. Complete the table with your answers. Show your work on a separate sheet of paper.

Earnings per Share = Latest Annual Earnings ÷ Number of Shares Outstanding

Market Cap = Number of Shares Outstanding x Current Stock Price

*Hint:* Convert large numbers into expanded format (1.2 million = 1,200,000) before performing the calculations.

	Number of Shares Outstanding	Current Price	Latest Annual Earnings	Earnings per Share	Market Cap
1	\$8.4 million	\$32.41	<i>\$12.4 million</i>	\$1.48	\$272,244,000
2	\$78 million	\$21.65	\$66.3 million	\$0.85	\$1,688,700,000
3	\$2 billion	\$18.26	\$603 million	\$0.03	\$36,520,000,000
4	\$371 million	\$9.77	\$89 million	\$0.24	\$3,624,670,000
5	\$471.2 million	\$16.34	\$735 million	\$1.56	\$7,699,408,000
6	\$150 million	\$33.52	\$306 million	\$2.04	\$5,028,000,000
7	\$52 million	\$26.78	\$92 million	\$1.77	\$1,392,560,000
8	\$564 million	\$8.07	<i>\$676.8 million</i>	\$1.20	\$4,551,480,000
9	\$90 million	\$10.19	\$32.4 million	\$0.36	\$917,100,000
10	\$821 million	\$19.23	<i>\$525.4 million</i>	\$0.64	\$15,787,830,000

## ACTIVITY 2G: CURRENCY CONVERSIONS

Country	Currency Name	Foreign Currency Units
Australian	Dollar (\$A)	1.544
Canada	Dollar (\$)	1.378
China, P.R.	Yuan (NT\$)	8.2769
India	Rupee (Re)	47.0500
Ireland	Euro (€)	0.8688
Japan	¥en (¥)	116.2
Mexico	Peso (\$)	10.1820
Turkey	Lira (TL)	1,483,000
United Kingdom	Pound (£)	0.6181
Venezuela	Bolivar (B)	1,596

**Amount of Foreign Currency = American Dollars x Foreign Currency Unit**

Use the formulas and information above to answer the questions. Round to the nearest hundredth.

1. How much would a stock costing \$45.22 cost in Venezuelan Bolivar?
2. How much would a stock costing \$13.21 cost in Mexican Pesos?
3. How much would a stock costing \$24.10 cost in Chinese Yuan?
4. How much would a stock costing \$8.63 cost in Indian Rupee?
5. How much would a stock costing \$18.26 cost in Turkish Lira?
6. How much would a stock costing \$21.75 cost in Euros?
7. How much would a stock costing \$11.14 cost in British Pounds?
8. How much would a stock costing \$10.00 cost in Australian Dollars?
9. How much would a stock costing \$7.75 cost in Japanese ¥en?
10. How much would a stock costing \$9.35 cost in Canadian Dollars?

## ACTIVITY 2G : CURRENCY CONVERSIONS (ANSWER KEY)

Country	Currency Name	Foreign Currency Units
Australian	Dollar (\$A)	1.544
Canada	Dollar (\$)	1.378
China, P.R.	Yuan (NT\$)	8.2769
India	Rupee (Re)	47.0500
Ireland	Euro (€)	0.8688
Japan	¥en (¥)	116.2
Mexico	Peso (\$)	10.1820
Turkey	Lira (TL)	1,483,000
United Kingdom	Pound (£)	0.6181
Venezuela	Bolivar (B)	1,596

**Amount of Foreign Currency = American Dollars x Foreign Currency Unit**

Use the formulas and information above to answer the questions. Round to the nearest hundredth.

1. How much would a stock costing \$45.22 cost in Venezuelan Bolivar? **72,171.12 B**
2. How much would a stock costing \$13.21 cost in Mexican Pesos? **\$134.50**
3. How much would a stock costing \$24.10 cost in Chinese Yuan? **NT\$199.47**
4. How much would a stock costing \$8.63 cost in Indian Rupee? **406.04 Re**
5. How much would a stock costing \$18.26 cost in Turkish Lira? **27,079,580 TL**
6. How much would a stock costing \$21.75 cost in Euros? **18.90 €**
7. How much would a stock costing \$11.14 cost in British Pounds? **6.89 £**
8. How much would a stock costing \$10.00 cost in Australian Dollars? **\$15.44**
9. How much would a stock costing \$7.75 cost in Japanese ¥en? **900.55 ¥**
10. How much would a stock costing \$9.35 cost in Canadian Dollars? **\$12.88**

# APPENDIX A

 0010

Date \_\_\_\_\_

Pay to the order of \_\_\_\_\_

\_\_\_\_\_ dollars

For \_\_\_\_\_ 

000000000: 0000000000000000: 0010

 0011

Date \_\_\_\_\_

Pay to the order of \_\_\_\_\_

\_\_\_\_\_ dollars

For \_\_\_\_\_ 

000000000: 0000000000000000: 0011

# APPENDIX B

Correlation of *Math Behind the Market* to *Principles and Standards for School Mathematics* by the National Council of Teachers of Mathematics, 2000

Standards	Unit 1									Unit 2						
	A	B	C	D	E	F	G	H	I	A	B	C	D	E	F	G
<b>Number and Operations</b>																
Understand numbers, ways of representing numbers, relationships among numbers, and number systems																
Understand the place-value structure of the base-ten number system and be able to represent and compare whole numbers and decimals (Gr.3-5)		❖		❖		❖	❖							❖		
Recognize equivalent representations for the same number and generate them by decomposing and composing numbers (Gr.3-5)									❖	❖						
Develop understanding of fractions as parts of unit wholes, as parts of a collection, as locations on number lines, and as divisions of whole numbers (Gr.3-5)	❖															
Recognize and generate equivalent forms of commonly used fractions, decimals, and percents (Gr.3-5)									❖	❖						
Work flexibly with fractions, decimals, and percents to solve problems (Grades 6-8)											❖	❖	❖	❖	❖	❖
Compare and order fractions, decimals, and percents efficiently and find their approximate locations on a number line (Grades 6-8)	❖	❖	❖	❖	❖	❖	❖									
Develop an understanding of large numbers and recognize and appropriately use exponential, scientific, and calculator notation (Grades 6-8)																❖
Develop a deeper understanding of very large and very small numbers and of various representations of them (Grades 9-12)																❖
Understand meanings of operations and how they relate to one another																
Understand the meaning and effects of arithmetic operations with fractions, decimals, and integers (Grades 6-8)											❖	❖	❖	❖	❖	❖
Judge the effects of such operations as multiplication, division, and computing powers and roots on the magnitudes of quantities (Grades 9-12)																
Compute fluently and make reasonable estimates																
Select appropriate methods and tools for computing with fractions and decimals from among mental computation, estimation, calculators or computers, and paper and pencil, depending on the situation, and apply the selected methods (Grades 6-8)											❖	❖	❖	❖	❖	❖
Develop and analyze algorithms for computing with fractions, decimals, and integers and develop fluency in their use (Grades 6-8)											❖	❖	❖	❖	❖	❖
<b>ALGEBRA</b>																
Represent and analyze mathematical situations and structures using algebraic symbols																
Express mathematical relationships using equations (Gr.3-5)															❖	❖
Use mathematical models to represent and understand quantitative relationships																
Model problem situations with objects and use representations such as graphs, tables, and equations to draw conclusions (Gr.3-5)	❖	❖	❖	❖	❖									❖		❖
<b>Data Analysis and Probability</b>																
Formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them																
Represent data using tables and graphs such as line plots, bar graphs, and line graphs (Gr.3-5)				❖	❖									❖		

Standards	Unit 1									Unit 2							
	A	B	C	D	E	F	G	H	I	A	B	C	D	E	F	G	
<b>Problem Solving</b>																	
<b><u>Build new mathematical knowledge through problem solving</u></b>											❖		❖	❖	❖		❖
Solve problems that arise in mathematics and in other contexts											❖		❖	❖	❖		❖
Apply and adapt a variety of appropriate strategies to solve problems											❖		❖	❖			❖
<b>Communication</b>																	
<b><u>Organize and consolidate their mathematical thinking through communication</u></b>		❖		❖			❖						❖		❖		
Communicate their mathematical thinking coherently and clearly to peers, teachers, and others		❖		❖			❖						❖		❖		
Use the language of mathematics to express mathematical ideas precisely.		❖		❖			❖						❖		❖		
<b>Connections</b>																	
Understand how mathematical ideas interconnect and build on one another to produce a coherent whole																	
Recognize and apply mathematics in contexts outside of mathematics	❖	❖	❖	❖	❖	❖	❖	❖	❖	❖	❖	❖	❖	❖	❖	❖	❖
<b>Representation</b>																	
Create and use representations to organize, record, and communicate mathematical ideas				❖	❖									❖			



