

# What is a Stock?

## Suggested Grade

High School - all levels

## Suggested Time

50 minutes

## Teacher Background

When you buy stock you become part owner of a public company—no matter how many shares you own. If the stock price exceeds what you paid for it, your investment increases in value. If the stock price goes lower than what you paid for it, your investment decreases in value. You risk only the money you invest.

Not all companies are public. Private companies are composed of an individual/family or a small group of investors that have private sources for funding growth; their shares are not for sale to the general public. Mars Corp, the snack food giant, is privately held. Google, the search engine company, was privately held until 2005, when it went public, offering its stock for sale.

If a company's product or service is in great demand, demand may outstrip the ability of banks and venture capitalists (who privately supply funding) to provide money for the company's expansion to meet that demand. At that point company leaders may decide to "go public."

Company management goes to investment bankers to negotiate an agreement to underwrite a stock offering known as an IPO (Initial Public Offering). The investment bankers buy all the shares that will be offered to the public at a set price (primary market). In other words, they underwrite the IPO. The investment bankers then sell the stock to the general public (secondary market) in the hopes of making a profit.

In addition to finding underwriters, company management must register its stock with the Securities and Exchange Commission (SEC) before "going public." Generally, companies can offer two types of stock, common and preferred. Common stock entitles the owners (called stockholders or shareholders) to collect dividends, if the company declares them. It also entitles the owners to vote in company elections and decisions. Stockholders who purchase common stock share in most of a company's profits and losses.

Stockholders who purchase preferred stock are usually guaranteed a dividend payment. This payment is made before any payments to common stock holders. If a company fails, preferred stock holders are repaid before common stock holders. Preferred stock holders do not share in most of a company's profits or losses. Preferred stock holders also do not have any voting rights.

An important difference between common stock and preferred stock is that the price of the preferred stock tends to be more stable, changing little over time, than that of common stock.

Stocks are bought and sold on exchanges. The Stock Market Game program is an electronic platform in which students buy and sell simulated shares on the three different major U.S. stock exchanges: the American Stock Exchange (AMEX), the New York Stock Exchange (NYSE) and the NASDAQ Stock Market.



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It is important for students to understand the functions and properties, advantages and disadvantages of stock in preparation for learning about risk and reward and prior to making their Stock Market Game investments. Young investors as well as old will always be faced with the question: How much risk do I want to assume when buying stock in a company?

## Vocabulary

**Common Stock:** Shares of a company that do not guarantee a dividend and have more risk and volatility than preferred shares. Common stock holders have the benefit of providing shareholders with the right to vote for the board of directors as well as on issues that come before the board at the annual meeting of shareholders.

**Corporation:** A business that is owned by stockholders and has right and responsibilities as if it were a person.

**Dividend:** Part of a company's profits (earnings) that it pays as money to stockholders.

**Earnings:** The amount of money that remains after subtracting the company's expenses from its revenue.

**Investor:** Someone who risks funds by purchasing financial products with the hope the investments will increase in value over time.

**IPO:** Initial Public Offering; the initial sale of stock to the public by investment bankers.

**Preferred Stock:** Shares of ownership of a company in which the share holder is guaranteed a dividend if one is declared and whose shares are usually not as volatile as common stock. Preferred stock holders do not have voting rights in company elections and decisions.

**Private Company:** A company that is owned by a person, family, or small group of investors that does not sell shares of stock in the company to the public.

**Public Company:** A company that is owned by investors who buy shares of stock, partial ownership of the assets of a business, in the corporation usually through one of the stock exchanges.

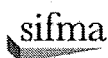
**Risk:** The chance of losing all or part of an investment.

**Stock:** A type of security that signifies ownership in a corporation and represents a claim to a part of the company's profits or losses. Companies usually issue stock to raise money for a variety of reasons, including expanding or modernizing their operations.

**Tombstone Ad:** An announcement appearing in financial publications such as *The Wall Street Journal* announcing a company's Initial Public Offering (IPO.)

**Underwriter:** Typically an investment banker, buys an entire new securities issue from the company or government offering it, and resells the issue as individual stocks or bonds to the public.

**Volatility:** Indicates how much and how quickly the value of an investment, market, or market sector changes.



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# Performance Objectives

Students will be able to:

- Define and give examples of: common stock, investor, risk, public corporation, private company, preferred stock, earnings and dividends.
- Explain why there is risk involved in stock ownership.
- Make decisions as a group on the benefits of investing in stocks verses costs/ and or loss of use of capital.
- Calculate gain and loss from sample stock sales.
- Explain the differences between common stock and preferred stock.
- Explain how a company will “go public” by issuing an IPO.

## Materials

- Access to the Internet
- Activity Sheet 1: What is a Stock?
- Activity Sheet 2: Stock Market Calculations
- Activity Sheet 3: A Tale of two Chocolate Companies

## Springboard Activity

### Ask

Which is the best sneaker on the market? Why?

How do you know it is the best?

If it is the best, would you want to own all or part of that company?

## Procedure

Explain that today the class will learn how they can own parts of public companies by purchasing shares of their stock.

Have students speculate why the founders of companies like Nike, Apple, and Sony—that manufacture popular products like Air Jordans, the Ipad, and PS2—gave up a portion of their ownership to sell shares to the public.

## Distribute

Activity Sheet 1: What is a Stock?

Ask the students to use the reading to define common stock preferred stock and stock exchange.

Ask them to explain how a stock “goes public.” After a discussion of the responses discuss the advantages and risks of purchasing stock.

### Novice Level:

Explain to the students that they already have one of several important tools needed when purchasing stock: knowledge of products people like.

Have the students, in their Stock Market Game teams; select five products with which they are familiar.



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Have them research: Which companies make the products? Which companies are publicly traded and which are privately held? What other products do the companies make?

Each student on the team should choose a company that produces one of these five products and create a profile of that company. (See [www.nyse.com](http://www.nyse.com) or [www.hoovers.com](http://www.hoovers.com) for an example of a company profile)

### ***Apprentice & Master Levels***

Yahoo! Finance (<http://finance.yahoo.com>) lists Best and Worst IPOs from the past year in their Stock Research section.

Ask your students to review the lists.

- Are there companies you recognize?
- How did they perform (Best or Worst)?

In their SMG teams have students select a company from either list and research:

- What products and/or services does the company provide?
- Why do you think the companies choose to go public?
- What has happened to the stock price since the decision to go public?
- Would you invest in this company?

### ***Grand Master Level***

In their SMG teams have the students visit the IPOs in the Past Year list in the Stock Research section of Yahoo! Finance (<http://finance.yahoo.com>).

The three major US exchanges also report on new IPOs:

The New York Stock Exchange (<http://www.nyse.com>) - click About NYSE, then Listed Companies, and then IPO Showcase.

American Stock Exchange (<http://www.amex.com>) - Click Equities then Listed Companies, and then New Listings.

The NASDAQ Stock Market (<http://www.nasdaq.com>) - Click IPO from the top menu bar.

Have the team select two companies from the same industry and research:

- What products and/or services do the companies provide?
- Why do you think the company went public?
- Compare the results since their IPO. In which company would you invest? Why or why not?



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## Assessment

Mars Candy Company, producer of Milky Way and other candy, is privately owned. Have students write a letter to the president of Mars Candy Company explaining:

- The reasons for and benefits of going public.
- How a company offers its initial stock.

## Application

### *Novice Level*

Using *Activity Sheet 2: Stock Market Calculations* have students complete problems 1 and 2 to practice calculating the profit or loss from sample stock sales.

### *Apprentice & Master Level*

Have a student from each group play the role of a financial advisor and convince the class that the newly public company their team has researched is worth the class' investment.

### *Grand Master Level*

Mars is a privately held company that individual investors cannot own. However, Mars and Hershey are not the only candy makers out there.

Have your SMG teams compare Hershey (Symbol: HSY) with Cadbury Schweppes (Symbol: CSG).

- What products/services do both offer?
- What are the last trade (closing) prices for both companies?
- Which would your team include in its SMG portfolio? Why?

## Enrichment Activities

Have students read Activity Sheet 3: A Tale of Two Companies.

OR

**Steve wants to invest \$10,000 in PepsiCo (stock symbol PEP)—the company that makes snack foods, and beverages, including Pepsi Cola and Fritos. He must decide whether to buy common shares or preferred shares in PepsiCo.**

**When Steve looked at the stock, its common stock shares were selling for \$57.38 per share and preferred shares were selling for \$71.60. Common stock shareholders are paid a dividend of \$1.80 per share, while preferred stock holders earn \$2.30 per share of stock.**

Have students give advice (oral or written) to Steve including:

- Which kind of stock do they think Steve should buy?
- Should Steve accept more risk by buying common shares or play it safe and purchase preferred shares of his favorite company? Justify your answer and be sure to explain the difference between common stock and preferred stock.
- How much Steve would earn in dividends if he invested the \$10,000 in common shares and held them for at least a year? How much dividend income would he earn if he invested in preferred shares?



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# Answer Key

## Activity Sheet 1

1. F Stockholders can only make money by collecting dividends.
2. F People who invest in the stock market will automatically make money.
3. T You can only buy stock in publicly held companies.
4. F Preferred stock means the company is preferred over other companies in a particular industry.
5. T A dividend is a portion of the company's profits paid to its shareholders.
6. F Profits represent ownership of shares of a company.
7. F Risk is only associated with the purchase of common stocks.
8. T A person who is 25 should not be willing to take the same amount of risk when investing as someone who is 55.
9. F It is possible for stockholders to lose money in addition to the amount they invested, if a company fails.
10. F A tombstone ad is prepared for companies that are facing bankruptcy and financial failure.
11. F Investment bankers buy shares of stock on the same type of market that the general public does.
12. F The general public buys new issues of stock on the primary market.

## Activity Sheet 2:

1. *The profit from the sale of each share of stock is calculated by subtracting the cost per share which was \$47.75 for the sale price of \$62.25, equaling \$14.50. Then you multiply the profit times the 723 shares which is \$10,483.50.*
2. *You need to multiply the dividend of \$1.25 per share times the number of shares which is 720. The result is an earning of \$900.*
3. *You again subtract the cost which is \$57.12 per share from the selling price which is \$68.38 per share. You then take the resulting profit of \$11.26 and multiply it times the number of shares which is 250. This means there is \$2,815 in profit.*
4. *You multiply each price times 100, which represents the number of shares. You then add up \$115 + \$79 + \$84 which is \$278 in dividends.*
5. *You will need to add the sale of stock profit of \$10,483.50 and \$2815 to get \$13,298.50. You will need to add the \$900 + \$278 to get \$1,178 in dividend profit.*



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## Activity Sheet 3

1. Mars is only owned by the family whereas Hershey is owned by a group of stockholders and is run by a Board of Directors. You can buy stock in Hershey, but you can't buy stock in the Mars Company.
2. The Mars Corporation would have to go to banks or private investors to get funds to raise the money to expand its business.
3. The Hershey Corporation can sell more shares of stock since it is a publicly traded company.
4. The Hershey Company could give away more of its money to charity and also not develop as many different types of snack foods as the Mars Corporation.



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# Activity Sheet 1: What is a Stock?

Stocks represent a share of ownership in a publicly held company. Private companies do not issue stock. As a stockholder, the investor has a claim on the assets of the company in exchange for money paid for the stock. The stockholder also shares with the original owners in the company's wealth along with the risks. No matter how few shares of stock you own, you are part owner of the company.

Most people buy stock to make money by: earning dividends (cash paid to investors from the company's profits) or selling the stock at a higher price. Shareholders have limited liability: they can only lose the money they invested in the company should the corporate fail.

Stockholders should make investment decisions based upon their "risk tolerance." A number of issues contribute to an investor's overall risk tolerance, including the investor's age, health and their overall financial outlook. An investment with some risk but great potential for return might be a good investment for someone who is 28 and financially stable, but **not** for someone who is sixty and plan to retire in five years.

Before you can buy stock or invest in a company, it has to "go public." If a company's product or service is in great demand, that demand may outstrip the ability of banks and venture capitalists (investors who privately provide money) to fund company expansion required to keep pace with the rapidly growing demand for the company's product or service.

When this happens, the company's management may decide to "go public." First, they find an investment banker to underwrite their stock offering, known as an IPO (Initial Public Offering). The investment banker buys all the company's shares of stock at a set price (primary market), thus underwriting the offering. The investment banker then sells the stock to the general public (secondary market) to make a profit.

In addition to preparing a prospectus, underwriters also prepare what is known as a tombstone ad (an announcement) that appears in financial publications such as the *Wall Street Journal*. The underwriters may also organize meetings with people who buy large amounts of stock for institutions such as pension funds, mutual funds, banks or insurance funds that they hope will buy shares in the company.

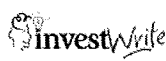
There are two basic forms of stock: common and preferred. Common stock provides its holder with the right to vote on major company issues and on who will serve on the company's board of directors. Common stock is usually more prone to rapid changes in its value than is preferred stock. Therefore, there is more risk associated with common stock than preferred.

Holders of preferred stock usually do not have voting rights and the stock usually does not grow or drop in value as much as common stock. It is usually more expensive than common stock. If the company issues dividends, preferred stock holders are always paid first—before holders of common stock—and they are guaranteed a portion of the profits if dividends are declared.

Each type of stock has benefits and drawbacks. Both common and preferred stocks are bought and sold in the same manner. A company may offer both common and preferred stocks. Both common and preferred stock signify ownership in the issuing company. Both common and preferred stock are traded on stock exchanges.



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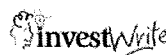
A stock exchange provides a platform (live, electronic, or both) for investors to buy and sell stock with each other. There are two largest US stock exchanges: the NASDAQ Stock Market and the New York Stock Exchange. Each exchange has its own listing standards, rules, and methods of operation. Companies and underwriters take great care in deciding which exchange to list or trade their stock on.

**Team Questions:** Decide whether each of the following statements is true or false. Earn bonus points by writing a reason or example to prove a true answer or by correcting a false statement.

1. \_\_\_\_ Stockholders can only make money by collecting dividends.
2. \_\_\_\_ People who invest in the stock market will automatically make money.
3. \_\_\_\_ You can only buy stock in publicly held companies.
4. \_\_\_\_ Preferred stock means the company is preferred over other companies in a particular industry.
5. \_\_\_\_ A dividend is a portion of the company's profits paid to its shareholders.
6. \_\_\_\_ Profits represent ownership of shares of a company.
7. \_\_\_\_ Risk is only associated with the purchase of common stocks.
8. \_\_\_\_ A person who is 25 should not be willing to take the same amount of risk when investing as someone who is 55.
9. \_\_\_\_ It is possible for stockholders to lose money in addition to the amount they invested, if a company fails.
10. \_\_\_\_ A tombstone ad is prepared for companies that are facing bankruptcy and financial failure.
11. \_\_\_\_ Investment bankers buy shares of stock on the same type of market that the general public does.
12. \_\_\_\_ The general public buys new issues of stock on the primary market.



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# Activity Sheet 3: A Tale of Two Chocolate Companies

## Mars, Inc.

It all began in 1911 in the kitchen of Frank and Ethel Mars in Tacoma, Washington, when they began by making and selling a variety of butter-cream candies from their home. In 1920, after visiting a local drugstore with his son Forrest, Frank Mars thought it would be good to produce a version of chocolate, malted milk that could be enjoyed anywhere. The result was the MILKY WAY bar, later known in Europe as the MARS bar. It was an immediate success.

Together the Mars family created their own company that later produced many other world famous brands like SNICKERS and M&M's. These candies became the foundation of what was to become a global snack food business. Their business was further strengthened when, working in Europe during the '30s, Forrest Mars thought it would be a good idea to give chocolate a protective candy coat to stop it from melting. The idea heralded the creation of M&M'S candies; the success of these tiny portable snacks was ensured when they were adopted as a staple ration for US forces. Today, M&M'S are famous the world over.

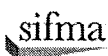
By the 1970s, the Mars Family Corporation was known for a variety of businesses classified into four distinct areas: snack food, food, pet care, and drinks vending and electronics. As a result, Mars has grown from one kitchen to a multi-billion dollar business. Over the years, Mars has created and marketed a group of products, from M&M'S, TWIX, MARS, and SNICKERS in snack food, to PEDIGREE, WHISKAS, CESAR and SHEBA in pet care, and UNCLE BEN'S in food.

## The Hershey Company

Raised in rural central Pennsylvania, lacking a formal education and nearly bankrupt at age 30, Milton S. Hershey created the company we know today as Hershey Foods.

The company began as a small subsidiary of Milton Hershey's Lancaster Caramel Company. Using chocolate-making equipment purchased at the 1893 Columbian Exposition in Chicago, Milton's company produced baking chocolate, cocoa and sweet chocolate coatings for its parent company's caramels. After building his own milk-processing plant and working day and night for three years, Milton Hershey became the first American to develop a formula for manufacturing milk chocolate. It was affordable, tasted good and remained fresh for a long time. It was an immediate sensation!

Hershey Foods, unlike the private Mars Company, is publicly traded. This means that members of the public can become part owners in the company by purchasing stock.



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Hershey, from its humble beginnings in 1893 to today, has also become a multi-billion dollar business. Milton Hershey not only became one of America's wealthiest individuals, but a successful entrepreneur whose products are known the world over. He was a visionary builder of the town which bears his name and, a philanthropist whose open-hearted generosity continues to touch the lives of tens of thousands of people.

Through technology, modernization, and new product development, the Hershey Company has grown spectacularly. Today, the Hershey Company, like its counterpart the Mars Company, is a leading snack food company and the largest North American manufacturer of chocolate and non-chocolate confectionery products, as well as other related grocery products.

**Based on the reading above answer the following questions:**

1. Explain what you think it means that Mars is a privately held company and Hershey is a publicly held company.

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2. If the Mars Corporation wanted to raise the money to expand its business, how could they do it?

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3. How can the Hershey Corporation raise funds to expand its business?

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4. Mars is an 18-billion dollar privately owned business; Hershey is only a 9 billion dollar publicly owned business. How could Hershey sell more candy and chocolate than Mars and still be the smaller of the two companies? Discuss and write your answers.

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## *What is a Stock?*

### *Lesson Summary*

*What is a Stock?* demonstrates to students how they can own parts of public companies by purchasing shares of their stock.

### *Lesson Objectives*

- Define and give examples of: common stock, investor, risk, public corporation, private company, preferred stock, earnings, and dividends.
- Explain why there is risk involved in stock ownership.
- Make decisions as a group on the benefits of investing in stocks verses costs and/or loss of use of capital.
- Calculate gain and loss from sample stock sales.
- Explain the differences between common stock and preferred stock.
- Explain how a company will “go public” by issuing an IPO.

### *NCTM Standards*

1A - Understand numbers, ways of representing numbers, relationships among numbers, and number systems.

1B - Understand meanings of operations and how they relate to one another.

1C - Compute fluently and make reasonable estimates.

5C - Develop and evaluate inferences and predictions that are based on data.

6C - Apply and adapt a variety of appropriate strategies to solve problems.

8A - Organize and consolidate mathematical thinking through communication.

8B - Communicate mathematical thinking coherently and clearly to peers, teachers, and others.

9A - Recognize and use connections among mathematical ideas.

### *Mathematical Strands*

	<b>Thinking Algebraically</b>	Students will practice writing algebraic expressions to represent buying and selling stocks.	
	<b>Interpreting Statistics</b>	Students calculate the value of an investment in stock using the formula: Value of Investment = (Number of Shares) (Price per Share)	
	<b>Communicating Quantitative Information</b>	Students graph the value of a portfolio over time.	
	<b>Tackling Complex Problems</b>	Students adjust their portfolios based on the performance of their stocks. In two evaluations, students calculate, reason, and chart the progress of a portfolio.	

## THINKING ALGEBRAICALLY

Write equations (=) or inequalities (<, >, ≤, ≥) that represent the problems below. You may use words or symbols, but please be sure you define your variables. Ignore broker's fees in the first three problems.

1. Write an equation to represent the following: You have a total of \$5,460 to spend, and you want to use it all to buy a number ( $x$ ) of shares that cost \$35.40 per share.
2. Write an inequality to represent the following: You don't want to spend more than \$6,820, and you want to buy  $y$  shares of stock that costs \$28.21 per share.
3. Write an inequality to represent the following: You are very interested in a stock whose price per share is \$76.05. You want to invest at least \$2,000, but no more than \$4,500.

In the following problems, write the equations or inequalities to represent each scenario including a broker's fee of 2% on each transaction.

4. You bought 95 shares of a stock at a price of  $\$Y$  for a total cost of \$11,821.80.
5. You bought  $n$  shares for \$33.12 a share, which cost you \$8,445.60.
6. You sold 480 shares of stock worth  $\$X$  per share. As a result, \$26,483.52 in cash came back to your portfolio.
7. You bought  $n$  shares worth \$48.24 each. You sold the shares at \$49.82, for a loss of \$246.72.
8. Refer to problem number 7. Why did you have a net loss when the stock price increased?

## INTERPRETING STATISTICS

1. If you know the number of shares you purchased and the price per share, how would you calculate the total value of your investment?
2. If you bought 3850 shares of DreamWorks Animation SKG, Inc. (DWA), in March for \$26.45 per share, how much did you invest initially?

This is a table of closing prices from March to April for DWA stock.

Month	Price
March	\$26.45
April	\$27.10
May	\$25.95
June	\$22.90
July	\$20.94
August	\$21.19
September	\$24.91
October	\$26.45
November	\$29.23
December	\$29.49
January	\$28.18
February	\$26.85
March	\$30.58
April	\$29.58

3. Make a table that shows how much your investment is worth during each of the months listed in the table. Your table should also include the change in the value of your investment. (There should be a column that shows the profit or loss you would have from selling all the stock on that date.) Ignore any commission (broker's fees).

## COMMUNICATING QUANTITATIVE INFORMATION

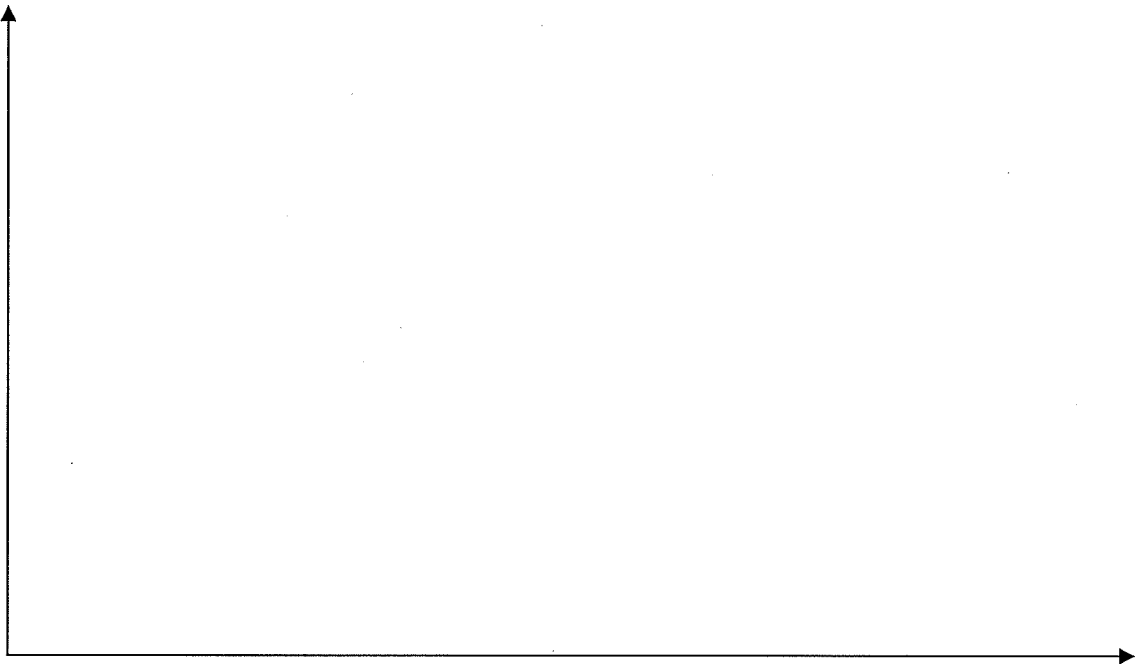
Choose an appropriate scale, and graph the value of the portfolio shown below. Mark important dates on the graph as appropriate.

Group A	
Date	Value
4/10/2007	\$100,000
4/11/2007	\$103,500
4/12/2007	\$102,970
4/13/2007	\$100,340
4/14/2007	\$99,730
4/17/2007	\$98,980
4/18/2007	\$99,102
4/19/2007	\$104,250
4/20/2007	\$103,590
4/21/2007	\$102,111
4/24/2007	\$101,553
4/25/2007	\$103,211
4/26/2007	\$104,006

## TACKLING COMPLEX PROBLEMS

Jennifer bought 800 shares of Wild Oats Market Inc. (OATS), at \$16.65 per share on September 21, 2006. On September 28, 2006, she sold 400 shares after its price had dropped to \$16.52. She bought 300 more shares on October 3, 2006, when the price had fallen to \$16.01. She sold all her OATS stock at \$17.09 on October 12, 2006.

1. How much money did Jennifer invest initially in the OATS stock?
2. Immediately after September 28, how many OATS shares did Jennifer still own? What was the value of those shares?
3. How many shares did she own immediately after her purchase on October 3? What was the value of those shares?
4. How many shares did she sell on October 12? How much money were those shares worth?
5. Chart the amount of money Jennifer had invested in Wild Oats Marker Inc. from September 21 to October 12.



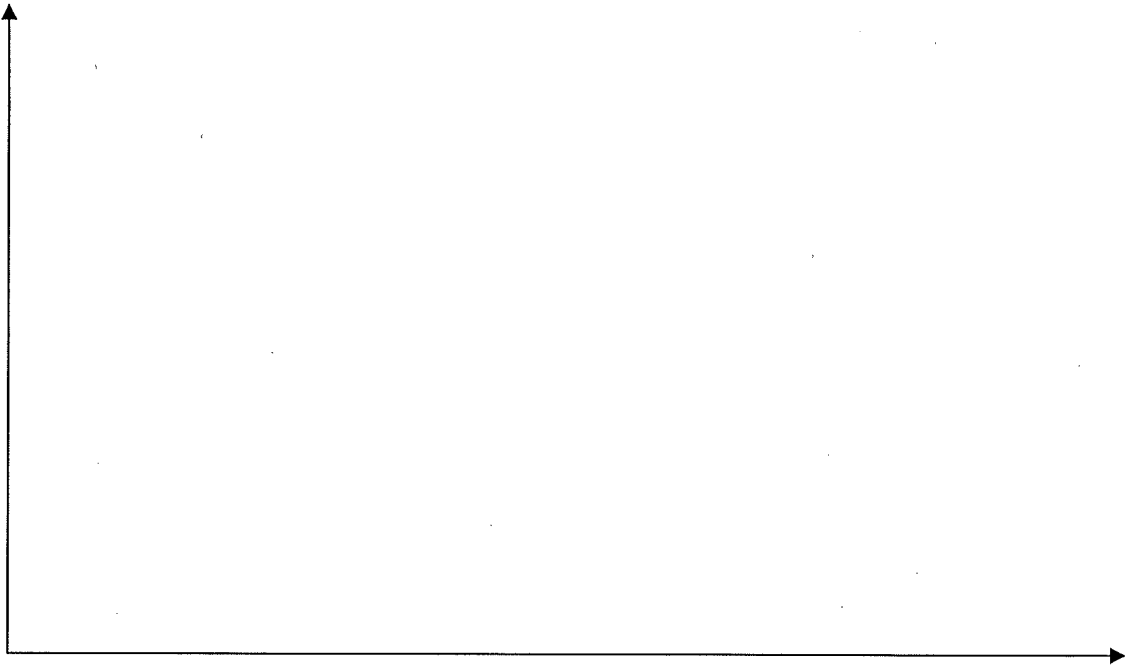
6. How much of a profit/loss did Jennifer make over the course of the investment?



## TACKLING COMPLEX PROBLEMS

Jacie's SMG group decided to buy 230 shares of El DuPont de Nemours & Co. (also known as DuPont, symbol: DD), on December 21, 2006 for \$48.98 per share. They sold half their stock on December 27, 2006, when the price had risen to \$49.19. They bought back 200 shares when the price dropped to \$48.05 on January 5, 2007, and then sold all their shares on January 17, 2007 for \$50.72 per share.

1. Ignoring the broker's fees the group paid each time they made a trade, chart the amount of money Jacie's group had invested in DuPont stock from December 21 to January 17. (You might find it helpful to make a table to keep track of the transactions first.)



2. How much of a profit/loss did the group make from their investment?

## What is a Stock?

### ANSWER KEY

*Please Note: 1. Prices included in lesson are not representative of actual market data and are for instructional purposes only. 2. Discrepancies may occur between student responses and the answer keys as a result of how far calculations were taken past the decimal point. In most instances, numbers were rounded from the thousandth or ten thousandth place.*

Write equations (=) or inequalities (<, >, ≤, ≥) that represent the problems below. You may use words or symbols, but please be sure you define your variables. Ignore broker's fees in the first three problems.

1. Write an equation to represent the following: You have a total of \$5,460 to spend, and you want to use it all to buy a number (x) of shares that cost \$35.40 per share.

*Answer: x = the number of shares purchased*

$$\$5,460 = \$35.40(x)$$

*Solution: x = 154.24*

2. Write an inequality to represent the following: You don't want to spend more than \$6,820, and you want to buy y shares of stock that costs \$28.21 per share.

*Answer: y = the number of shares purchased*

$$\$6,820 \geq \$28.21(y)$$

*Solution: y = 241.76*

3. Write an inequality to represent the following: You are very interested in a stock whose price per share is \$76.05. You want to invest at least \$2,000, but no more than \$4,500.

*Answer: n = the number of shares purchased*

$$\$2,000 \leq \$76.05(n) \leq \$4,500$$

In the following problems, write the equations or inequalities to represent each scenario including a broker's fee of 2% on each transaction.

4. You bought 95 shares of a stock at a price of \$Y for a total cost of \$11,821.80.

*Answer: Y = cost per share*

$$95(\$Y) + (.02)(95)(\$Y) = \$11,821.80$$

OR

$$(1.02)(95(\$Y)) = \$11,821.80$$

*Solution: Y = \$122.00*

5. You bought n shares for \$33.12 a share, which cost you \$8,445.60.

*Answer: n = number of shares bought*

$$\$33.12(n) + (.02)(\$33.12)(n) = \$8,445.60$$

OR

$$\$33.12(1.02)(n) = \$8,445.60$$

*Solution: n = 250.0*

6. You sold 480 shares of stock worth \$X per share. As a result, \$26,483.52 in cash came back to your portfolio.

*Answer: X = cost per share*

$$480(\$X) - (.02)(480)(\$X) = \$26,483.52$$

OR

$$480(.98)(\$X) = \$26,483.52$$

*Solution: X = \$56.30*

7. You bought n shares worth \$48.24 each. You sold the shares at \$49.82, for a loss of \$246.72.

*Answer: n = number of shares bought*

*(money earned when selling shares) - (money spent when buying shares) = gain/loss*

$$\$49.82(.98)(n) - \$48.24(1.02)(n) = -\$246.72$$

8. Refer to problem number 7. Why did you have a net loss when the stock price increased?

*Answer: Although the stock price increased, the gain earned by sale of the n shares of stock was still less than the amount of money you paid in broker's fees.*



## INTERPRETING STATISTICS

1. If you know the number of shares you purchased and the price per share, how would you calculate the total value of your investment?

*Answer: (n) =number of shares purchased*

*(s) =price per share. (t)=total value of investment*

$$t = n \times s$$

2. If you bought 3850 shares of DreamWorks Animation SKG, Inc. (DWA), in March for \$26.45 per share, how much did you invest initially?

*Answer: 3850 x \$26.45 = \$101,832.50*

This is a table of closing prices from March to April for DWA stock.

Month	Price
March	\$26.45
April	\$27.10
May	\$25.95
June	\$22.90
July	\$20.94
August	\$21.19
September	\$24.91
October	\$26.45
November	\$29.23
December	\$29.49
January	\$28.18
February	\$26.85
March	\$30.58
April	\$29.58

3. Make a table that shows how much your investment is worth during each of the months listed in the table. Your table should also include the change in the value of your investment. (There should be a column that shows the profit or loss you would have from selling all the stock on that date.) Ignore any commission (broker's fees).

*Answer:*

Month	Price/Share	X	No. of Shares	Value of Investment	Value of Gain/Loss	Profit or Loss
Mar	\$26.45	X	3850	\$101,832.50	-----	
April	\$27.10	X	3850	\$104,335.00	\$2,502.50	Profit
May	\$25.95	X	3850	\$99,907.50	-\$1,925.00	Loss
June	\$22.90	X	3850	\$88,165.00	-\$13,667.50	Loss
July	\$20.94	X	3850	\$80,619.00	-\$21,213.50	Loss
Aug	\$21.19	X	3850	\$81,581.50	-\$20,251.00	Loss
Sep	\$24.91	X	3850	\$95,903.50	-\$5,929.00	Loss
Oct	\$26.45	X	3850	\$101,832.50	\$0.00	Even
Nov	\$29.23	X	3850	\$112,535.50	\$10,703.00	Profit
Dec	\$29.49	X	3850	\$113,536.50	\$11,704.00	Profit
Jan	\$28.18	X	3850	\$108,493.00	\$6,660.50	Profit
Feb	\$26.85	X	3850	\$103,372.50	\$1,540.00	Profit
Mar	\$30.58	X	3850	\$117,733.00	\$15,900.50	Profit
April	\$29.58	X	3850	\$113,883.00	12,050.50	Profit



What is a Stock?  
Answer Key

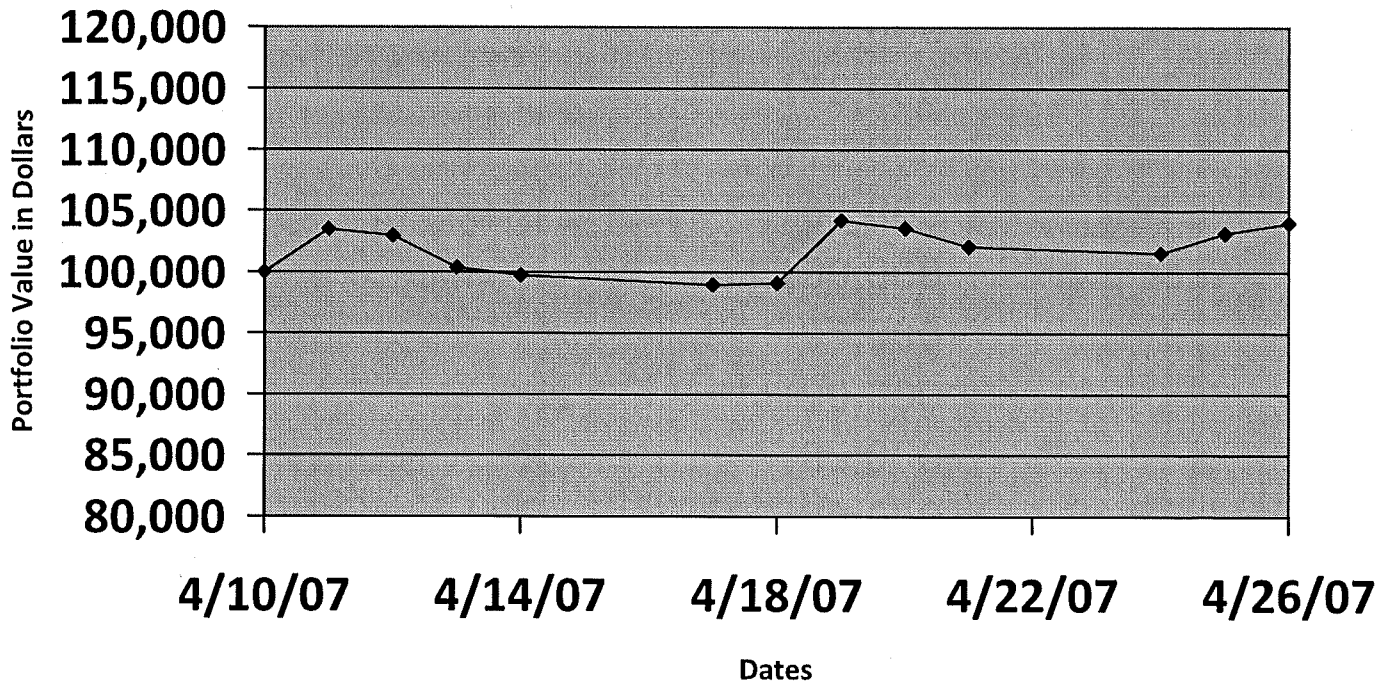
## COMMUNICATING QUANTITATIVE INFORMATION

Choose an appropriate scale, and graph the value of the portfolio shown below. Mark important dates on the graph as appropriate.

Group A	
Date	Value
4/10/2007	\$100,000
4/11/2007	\$103,500
4/12/2007	\$102,970
4/13/2007	\$100,340
4/14/2007	\$99,730
4/17/2007	\$98,980
4/18/2007	\$99,102
4/19/2007	\$104,250
4/20/2007	\$103,590
4/21/2007	\$102,111
4/24/2007	\$101,553
4/25/2007	\$103,211
4/26/2007	\$104,006

Answer:

### Group A's Portfolio



## TACKLING COMPLEX PROBLEMS

Jennifer bought 800 shares of Wild Oats Market Inc. (OATS) at \$16.65 per share on September 21, 2006. On September 28, 2006, she sold 400 shares after its price had dropped to \$16.52. She bought 300 more shares on October 3, 2006, when the price had fallen to \$16.01. She sold all her OATS stock at \$17.09 on October 12, 2006.

1. How much money did Jennifer invest initially in the OATS stock?

*Answer:*  $800 \times \$16.65 = \$13,320.00$

2. Immediately after September 28, how many OATS shares did Jennifer still own? What was the value of those shares?

*Answer:*  $800 - 400 = 400$  shares

*Value of those shares =  $400 \times \$16.52 = \$6,608.00$*

3. How many shares did she own immediately after her purchase on October 3? What was the value of those shares?

*Answer:* *Number of shares owned =  $400 + 300 = 700$*

*Value of those shares =  $700 \times \$16.01 = \$11,207.00$*

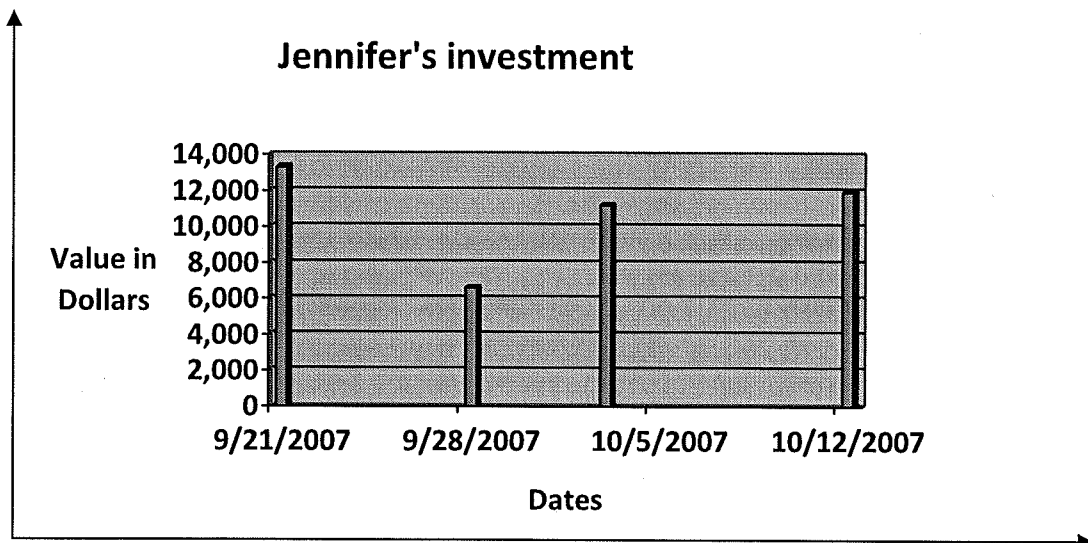
4. How many shares did she sell on October 12? How much money were those shares worth?

*Answer:* *Number of shares sold = 700*

*Value of those shares =  $700 \times \$17.09 = \$11,963.00$*

5. Chart the amount of money Jennifer had invested in Wild Oats Marker Inc. from September 21 to October 12.

*Answer:*



6. How much of a profit/loss did Jennifer make over the course of the investment?

*Answer:* *Jennifer made \$448.00 in profit (not including any commission).*

*Solution:* *She bought stock twice:  $\$13,320 + \$4,803 = \$18,123$*

*She sold stock twice:  $\$6,608 + \$11,963 = \$18,571$*

*Net gain =  $\$18,571 - \$18,123 = + \$448.00$  in profit.*



What is a Stock?  
Answer Key

## TACKLING COMPLEX PROBLEMS

Jacie's SMG group decided to buy 230 shares of El DuPont de Nemours & Co. (also known as DuPont, symbol: DD), on December 21, 2006 for \$48.98 per share. They sold half their stock on December 27, 2006, when the price had risen to \$49.19. They bought back 200 shares when the price dropped to \$48.05 on January 5, 2007, and then sold all their shares on January 17, 2007 for \$50.72 per share.

1. Ignoring the broker's fees the group paid each time they made a trade, chart the amount of money Jacie's group had invested in DuPont stock from December 21 to January 17. (You might find it helpful to make a table to keep track of the transactions first.)

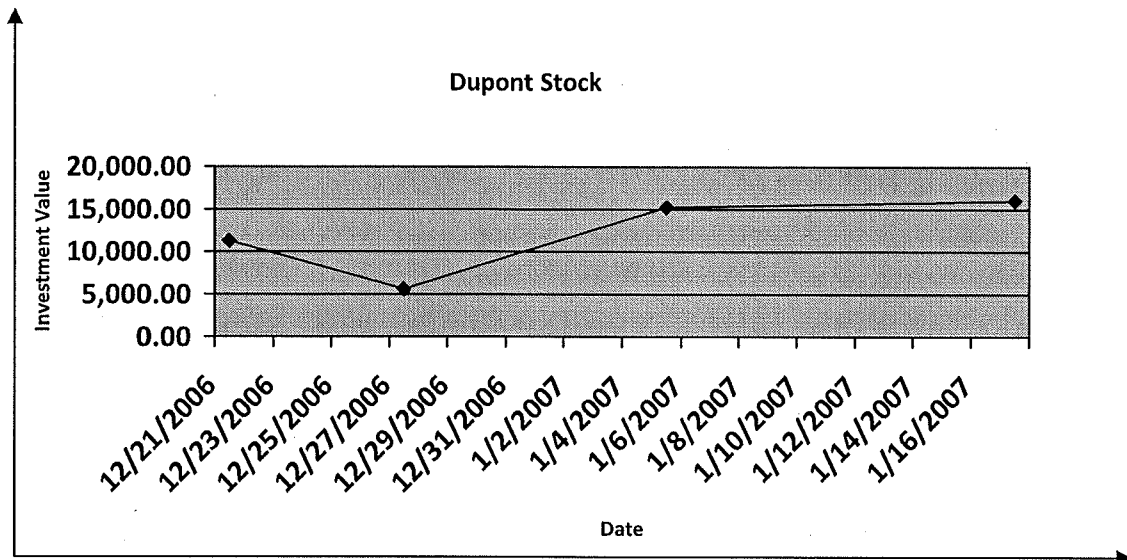
*Answers should include the following:*

*Bought:  $230 \times \$48.98 = \$11,265.40$  (12/21)*

*Sold:  $115 \times \$49.19 = \$5,656.85$  (12/27)*

*Bought:  $200 \times \$48.05 = \$9,610.00$  (1/5)*

*Sold:  $315 \times \$50.72 = \$15,976.80$  (1/17)*



2. How much of a profit/loss did the group make from their investment?

*Answer: Not including any commission, Jacie and her group made a profit of \$758.25*

*Solution: Jacie's SMG group made two trades in which she bought stock and two trades in which she sold stock.*

*Cost of purchased stock:  $\$11,265.40 + \$9,610.00 = \$20,875.40$*

*Income from sold stock:  $\$5,656.85 + \$15,976.80 = \$21,633.65$*

*Profit = Income from sold stock - Cost of purchased stock*

*=  $\$21,633.65 - \$20,875.40 = +\$758.25$*



What is a Stock?  
Answer Key

## TACKLING COMPLEX PROBLEMS

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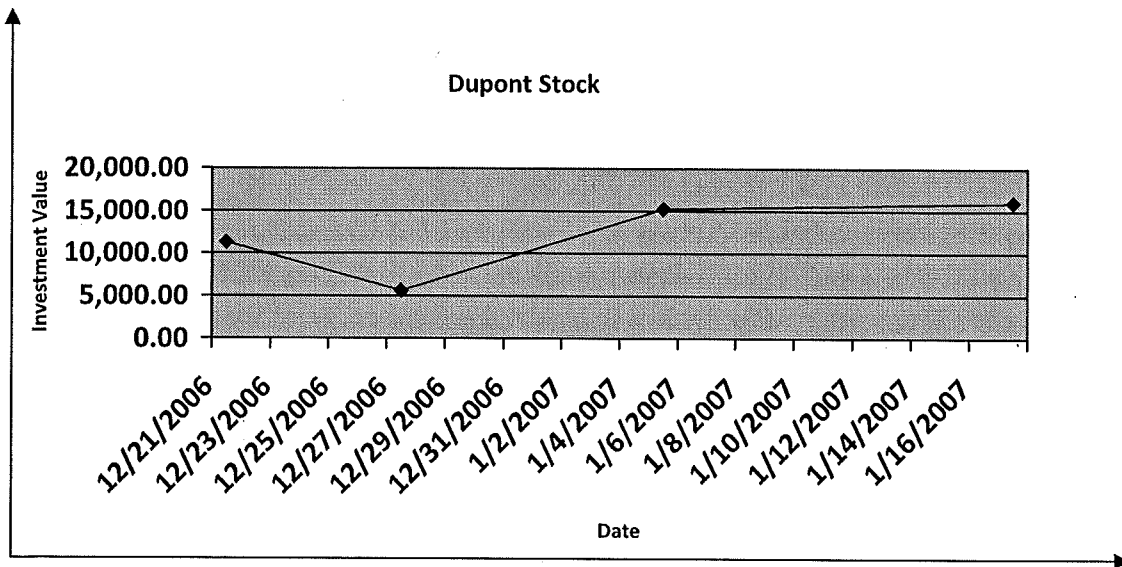
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Bought:  $200 \times \$48.05 = \$9,610.00$  (1/5)

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Profit = Income from sold stock - Cost of purchased stock  
 $= \$21,633.65 - \$20,875.40 = +\$758.25$



What is a Stock?  
 Answer Key