Money Math for Teens

Dividend-Paying Stocks

Dividend-Paying Stocks

Lesson Plan

OBJECTIVE

Introduce students to fundamental concepts of investing in dividend-paying stocks as an alternative to low-yield savings accounts and money market accounts.

Students will:

▶ Understand the vocabulary associated with dividend-paying stocks

▶ Calculate yield on a stock purchase at any particular value

▶ Analyze different options for building a portfolio of dividend-paying stocks

▶ Calculate return on investment, taking into account price swings and dividend payouts.

TEACHING MATERIALS

▶ Lesson plan

▶ Dividend-Paying Stocks student handout

▶ Student assessment worksheet with solutions

LESSON ACTIVITY

1. **Determine students' prior knowledge of fundamental vocabulary and concepts. Suggested questions:**

   • How many of you have a savings account?

      • Do you know the interest rate on the account?

   • How have interest rates changed in the last 10 years?

      • How do rates change, who changes them and why do they change?

      • What economic environments cause rates to rise and fall?

   • Have you heard of a dividend? If so, what is it?

2. **Introduce the student handout.**

   • Ask students to read pages 5 and 6, up to the Stocks section.

   • Ask the class to answer the questions on page 6:

      • What do you do with your extra money?

         – If you spend it, what do you buy?

         – If you save it, how do you do it?

      • Would you still put it in a bank savings account? Why or why not?

         – Would you be open to a different savings method?

      • Are there alternatives available that would bring you a 4% to 6% return?

3. **Stocks and dividends (page 7 of handout):**
   - A share of stock is ownership in a corporation.
   - Stocks trade on stock markets.
   - Stock prices **fluctuate,** meaning they go up and down.
   - Dividends are sums of money paid by a corporation to shareholders.
   - **Yield:** dividend earnings expressed as a percentage of an investment. Introduce the formula for calculating yield:

$$\text{Yield} = \frac{\text{Dividend}}{\text{Current Stock Price}} = \frac{1.60}{25} = 0.064 = \textbf{6.4\%}$$

Solutions to yield problems (page 10 of handout):

Stock Price	Dividend	Yield
$20.00	$0.80	0.04 = 4%
$40.00	$1.20	0.03 = 3%
$58.50	$2.10	0.0359 = 3.6%
$82.00	$1.55	0.0189 = 1.9%

Ask students:
   - What effect on a stock's price would you expect after a company announces it is raising its dividend?
     - It would make the stock more attractive and therefore tend to give the stock price a boost.
   - Do you think a company raising its dividend is always a signal of the company's strength?
   - Could a struggling company raise its dividend to get its stock price to rise?
   - What is stock price appreciation?

4. **Comprehension check (page 9 of student handout):**

   You invested **$1,000** in a dividend-paying stock that cost **$20 per share** and paid **$0.80 per year** in a dividend. Exactly one year later you sold that same stock at **$23 per share**. What would be your return on investment?

   - How many shares of stock did you purchase?
     1000/20 = **50 shares**
   - What was the dividend yield expected at the time of purchase?
     0.80/20 = 0.04 = **4%**
   - How much money did you collect in dividends?
     0.80 x 50 = **$40**

- When you sold, did you make a profit? How much?
  Yes.
  23 − 20 = 3
  3 x 50 = **$150**

- What was your profit yield?
  150/1000 = 0.15 = **15%**

- How much money did you collect in excess of your initial $1,000 investment?
  150 + 40 = **$190**

- What is the total yield return on your one-year investment?
  190/ 1000 = 0.19 = **19%**

Let's say you made your buy and sell transactions through an online brokerage account. You would have paid **$10 to buy** and another **$10 to sell** the shares. Your total investment cost would have been **$1,020.**

- What would the commission have done to your eventual yield?
  The yield would be slightly lower.
  190/1020 = **18.6%**

5. **Risk vs. reward (pages 10–11 of handout):**
   - Ways to determine if a company with a nice dividend is solid and not an overly risky investment:
     - Solid, mature, well-established companies raise dividends consistently.
   - Dividend aristocrats and achievers
     - Consistent dividends will compound over time.

6. **Depreciating stock price:**
   - A rising dividend increases the yield on an existing investment. The same can happen if a stock's price drops (pages 12–13 of handout):
     - A $50 stock with a $2 dividend yields 4%. A drop in price to $45 raises yield (if you buy at $45) to 4.44%.
   - Purchasing more stock at the lower price lowers the average price of an overall holding:
     - Purchasing a $45 share after a $50 share averages the yield to 4.21% for both investments combined.
     - Average price paid for the shares drops to $47.50/share.
   - Planning for a possible price drop might be a strategy for improving an investment after the initial purchase.

7. **Strategy for earning a desired 10% return on investment (pages 12–13 of handout):**

   - Let's say you've invested in a $50 stock paying a $2 dividend, and you want an overall 10% return.

     - This investment has a 4% annual yield, or 1% per quarter.

     - Holding the investment for 10 quarters (2.5 years) will result in a 10% return from dividends.

   - A rise in stock price to $55 per share is a 10% return on price appreciation, assuming the investment was held for a short term and no dividends had yet been received.

   - After one year of receiving dividends, a 4% return has been realized. It would take a $3 rise in stock price to $53 to achieve a 6% increase and complete the 10% desired return.

8. **Sample stock quote from IBM (via Yahoo Finance):**

   - Illustrates pertinent information about currently trading shares of stock. In particular, the 52-week stock price range, dividend and yield information are highlighted for students.

9. **Evaluate students' comprehension (see assessment worksheet).**

Student Handout: Dividend-Paying Stocks

Have you ever been surprised by your own success? You studied hard for a test but weren't confident about how well you did. When the results came in, you got a perfect score! You shouldn't have be too shocked, because hard work and perseverance often produce success.

What would you do if you found yourself successful with money? You have a job, you're good at it and you periodically get raises. After paying your expenses, you have money left over. Or maybe you start a small business mowing lawns in the neighborhood. You charge a good price and do an excellent job, and word spreads. The next thing you know, you are cutting more lawns and earning more money than you had expected.

If you are responsible enough to successfully create extra income, chances are you aren't about to waste it. You may treat yourself from time to time, rewarding yourself for your hard work. But what do you do with your extra money? Save for a car? Upcoming college expenses?

You've learned about the power of compound interest and how saving money steadily and leaving it to grow will reward you with even more money. But things aren't necessarily that simple. The path to saving extra money used to be clear: put money in the bank and let it earn interest. These days, average interest rates on savings accounts are as close to zero as you can get, and they may not rise anytime soon. Although interest rates paid on savings accounts vary by bank, generally the current rates on savings accounts vary from as little as 0.04% to 0.20%. If you deposit $1,000 into a savings account paying 0.04% annually, after one year you will earn:

1000 x 0.0004 = **$0.40**

At 0.20%:

1000 x 0.0020 = **$2.00**

Hardly worth parking your $1,000 there, right? Of course, the Federal Deposit Insurance Corporation (FDIC) protects deposits in US commercial banks up to $250,000. Money in a bank account is safe, and putting it in a savings account is a good way to protect it, but don't expect it to produce meaningful growth.

Currently, the interest rates banks are offering for savings accounts are low because the economy has been sputtering for several years now. The Federal Reserve Bank (the government agency responsible for watching over our economy) has been lowering interest rates steadily for years in response to sluggish economic numbers. The idea is to keep interest rates on borrowing low in order to encourage people and businesses to borrow money and thus invigorate economic activity. Because banks have to loan money at low rates, they have to lower the rates they pay on deposits to fund those loans. So, as borrowing interest rates drop, so do savings interest rates. This is bad news for savers.
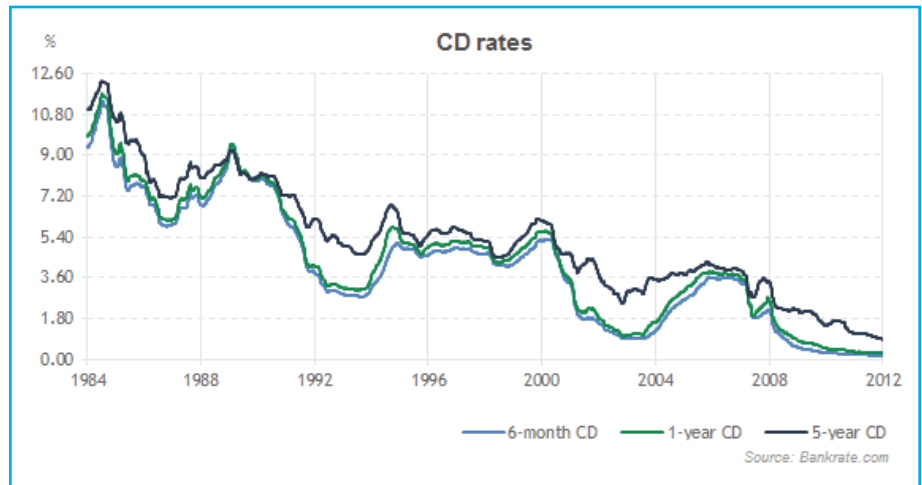
Dividend-Paying Stocks

Here is a chart showing the average interest rate on certificates of deposit dating back almost 30 years. You'll notice that rates haven't been this bad for savers in all that time.

CD rates history | 1984-2012

By Denise Mazzucco • Bankrate.com

This chart shows trends of the national average CD rates on 6-month CD yields, 1-year CD yields and 5-year CD yields since 1984, according to Bankrate's weekly survey on interest rates.

So:

▶ What do you do with your extra money?

▶ Would you still put it in a bank savings account? Why or why not?

▶ Are there alternatives available that would bring you a 4% to 6% return?

Dividend-Paying Stocks

Stocks

You've heard of the stock market, but what exactly are stocks? A **share of stock** in a corporation is a share of ownership. When you buy a share of stock, you are buying an ownership position in that company. If the company does well, the stock price rises. If you then sell that share at a higher price, you make money. If the stock price falls and you sell it at a lower price than what you paid, you lose money.

Investing money in stocks brings with it an element of risk. If the stock price falls, you can lose money—that's a risk. Stock prices fluctuate every second of every minute of every day that the stock market is open. But you don't need to concern yourself with these constant fluctuations. The current price of a stock doesn't affect your investment until you are ready to sell it. You purchased the stock at a certain price, and your investment is fixed at that price. If the stock has risen in price since you bought it, then selling it will bring you a profit. If you buy shares, hold onto them and aren't selling the stock today, then the current price doesn't really matter. A good reason to purchase shares of stock and hold them for long periods of time is known as **dividends.**

What Are Dividends?

Some corporations pay dividends to their shareholders. A **dividend** is a sum of money paid regularly (typically quarterly) by a company to its shareholders out of its profits (or reserves).

Companies sometimes reward their shareholders by paying them a portion of their profits. If you purchase shares of a company that pays dividends and you hold on to those shares for a prolonged period of time, you will get paid. Typically every quarter, a company will pay ¼ of its annual dividend amount. For example, if a company pays a $2 annual dividend per share of stock, then you will receive $0.50 per share you own each quarter. Regardless of the daily stock price, you will continue to receive dividends each quarter, as long as you own the stock and as long as the company continues to pay that dividend.

Yield

Yield is the ratio of the dividend amount to the current stock price. You can calculate the yield you will receive from holding a stock and accumulating the dividends before you buy it. Just divide the annual dividend amount by the current stock price:

$$\text{Yield} = \frac{\text{Dividend}}{\text{Current Stock Price}}$$

Dividend-Paying Stocks

Example >>>

> Metro Corporation is currently selling stock at $25 per share. The company pays a $1.60 dividend per year.
>
> $$\text{Yield} = \frac{1.60}{25} = 0.064 = \textbf{6.4\%}$$
>
> That's right—you'll earn a 6.4% yield on your $25 investment!

Calculate the yield you would get if you purchased these shares of dividend-paying stock at these prices:

Stock Price	Dividend	Yield
$20.00	$0.80	
$40.00	$1.20	
$58.50	$2.10	
$82.00	$1.55	

Benefits of Dividend-Paying Stocks

In recent years, dividend-paying stocks have become a popular investment for investors focused on income-producing investments. This is because traditional fixed-income investments like bank accounts and certificates of deposit are yielding next to nothing. Over time, stocks that pay a high dividend tend to outperform stocks that do not. From 1972 through September 2010, US-based dividend-paying stocks returned an average of 7.1% increase in price annually. Compared to the 1.5% average annual increase of non-dividend paying stocks, dividends are clearly an attractive choice.

Dividend-paying stocks have historically outperformed the overall stock market during periods when stock prices are weak. Investors gravitate toward dividend-paying companies during times of economic trouble. Companies that pay dividends are generally more conservative and have stronger cash flows, which allow them to pay their investors dividends in the first place. By paying dividends, companies indicate the strength of their business by showing that they are comfortable paying shareholders instead of saving their earnings for tough times.

Investing in dividend-paying stocks offers two possible ways to earn money: price appreciation of the stock itself and the dividends received by holding the stock long term.

Dividend-Paying Stocks

Comprehension Check

Remember the $1,000 we talked about putting in a bank savings account? It earned as little as 0.04% interest, or just 40¢, after a year. Let's look at what would happen if instead you invested that **$1,000** in a dividend-paying stock that cost **$20 per share** and paid **$0.80 per year** in a dividend. Exactly one year later you sold that same stock at **$23 per share.**

What would be your return on investment?

▶ How many shares of stock did you purchase?

▶ What was the dividend yield you expected at the time of purchase?

▶ How much money did you collect in dividends?

▶ When you sold, did you make a profit? If so, how much?

▶ What was your profit yield?

▶ How much money did you collect in excess of your initial $1,000 investment?

▶ What is the total yield return on your one-year investment?

Typically, if you have an online brokerage account, you can buy or sell stocks for a flat fee called a **commission.** It's common for that fee to be $10 per trade, buy or sell, regardless of the number of shares and the dollar amount of the transaction. Some companies will allow you to purchase shares through their web sites commission free, but not all will allow you to sell shares commission free.

Let's say you made your buy and sell transactions through an online brokerage account. You would have paid **$10 to buy** and another **$10 to sell** the shares. Your total investment cost would have been **$1,020.**

▶ What would the commission have done to your eventual yield?

▶ Would you still make the investment?

Dividend-Paying Stocks

Risk vs. Reward

Before you run out and research companies with the highest-yield dividends, let's talk a bit more about risk.

In some cases, a high-yield dividend can be a warning sign. Not every company with a high dividend has strong fundamentals supporting that dividend, such as good earnings. A high dividend can be an attempt to lure investors into buying the stock of a company in trouble, one that cannot continue to pay that dividend in the future. It also can be an attempt to attract attention to a stock and raise its price, but the price of the stock may be depressed for some fundamental reason.

Research is important in determining if a company offering a nice dividend is actually risky. Here are tips to keep in mind.

▶ Solid, mature, well-established companies raise dividends consistently. Good companies that reward their shareholders have reputations to protect. Paying consistent dividends to shareholders builds investors' trust, and that's a reputation most good companies would not risk.

▶ Consistent dividends will compound over time. If you reinvest the dividends you earn into buying more shares, you will consistently earn still more dividends.

▶ Some companies have been paying dividends and raising them every year for decades. This is a streak many companies wouldn't want to break.

  ▶ A **dividend aristocrat** is a Standard & Poor's 500 Index (S&P 500) company that has raised its dividend every year for the past 25 years. A **dividend achiever** has raised its dividend every year for the past 10 years.

   • The S&P 500 is an index of 500 stocks chosen for market size, liquidity and industry grouping, among other factors. The S&P 500 is designed to be a leading indicator of U.S. equities and is meant to reflect the risk/return characteristics of the **large cap universe** (companies with a market value of $5 billion or more).

   • Companies included in the index are selected by the S&P Index Committee, a team of analysts and economists at Standard & Poor's. The S&P 500 is a market value weighted index—each stock's weight is proportionate to its market value.

   Source of this definition: *http://www.investopedia.com/terms/s/ sp500.asp*

Dividend-Paying Stocks

If your dividends rise each year, so will your yield. For example, if you were to buy a $50 stock with a $2 annual dividend, your yield would be 4%. If a couple of years later the dividend has risen to $3 per year, your yield would be 6%! Remember, your yield is fixed when you buy the stock unless the dividend itself changes. The stock price might have doubled to $100 per share, but because you bought it at $50, your yield is 6%.

Earlier we mentioned that money held in a bank savings account is protected by the FDIC from loss (up to $250,000). Saving your money in a savings account involves no risk but returns a low reward when interest rates are low. As we've seen, investing in dividend-paying stocks can yield higher returns. The reward can come from holding the stock long term, collecting the dividends and waiting for the stock's price to appreciate. But there is risk involved in buying stocks, primarily from price depreciation—that is, the stock price can go down.

However, there may be a silver lining even if the stock's price drops. Let's say you purchase a share of stock at $50 and it pays a $2 dividend. Your yield will be 4%. If the price of that stock depreciates to $45 per share, then you've lost 10% of the value. But you haven't *actually* lost anything unless you sell the stock at $45.

What would the new yield be on this stock at $45 per share?

$$\text{Yield} = \frac{\text{Dividend}}{\text{Current Stock Price}} = \frac{2}{45} = 0.0444 = \textbf{4.44\%}$$

That's right: the yield *increased*. Buying the stock at this price point is actually a better deal than it was at $50.

If you purchased another share at $45, what would your average yield be?

The price you paid for both shares = 50 + 45 = **$95**

The dividend you will receive from both shares = 2 + 2 = **$4**

$$\text{Yield} = \frac{\text{Dividend}}{\text{Current Stock Price}} = \frac{4}{95} = 0.0421 = \textbf{4.21\%}$$

What is the average price you paid for your stocks?

$$\frac{50 + 45}{2} = \textbf{\$47.50}$$

The average price you paid for your stocks dropped to $47.50, and the average yield increased from 4% to 4.21%. Was that price drop really a bad thing? Are you starting to see the beginnings of a stock-purchasing strategy here?

Dividend-Paying Stocks

Strategies for Success

Let's not forget that you are already successful. You have extra money and want to make it work for you. Purchasing a $50 stock with a $2 dividend for the long term, not concerning yourself with daily price swings, will earn you a consistent 4% yield. This certainly beats the bank savings account alternative by a wide margin.

Should the stock price fall from your $50 entry point, you could use that fall in price as an opportunity to improve upon your investment. Instead of investing all of your money at $50, you could invest some of your money at that price, lock in the 4% return for the long term and wait. If the stock price falls below $50, you would have cash to reenter the stock at the lower price, reducing your average price per share and improving your average yield. Overall, you would make your investment even better.

If the stock price hovers around $50 and you are comfortable doing so, you can then commit the money you held back to increase the number of shares you hold at $50, and lock in the 4% return on all of your money.

But what if the stock price rises? If your yield gets better when the stock price falls, then it should get worse if the stock price rises. But don't forget about stock price appreciation making you profit. When a stock price rises above your average purchase price, you have made money, even though you don't actually collect those profits unless you sell the stock.

Let's go back to the very beginning. You have money to invest and you are looking to make it grow. You decide you'd like to make a **10% return** on your money. You've found a **$50 per share** dividend aristocrat or dividend achiever that pays a **$2 dividend per year.**

▶ How long do you need to hold the stock to achieve your desired 10% return by only collecting dividends?

By locking in a **4% annual return,** you'll receive **1% per quarter** in dividends. It will take 10 quarters, 30 months or **2.5 years to complete a 10% return.** You will achieve your goal based only on dividends and time.

▶ What would your return be if the stock price rose to $55 per share 30 days after you bought it?

A stock price rise to $55 per share is a 10% increase. If you sold the stock at that price, you would achieve a 10% return target quickly by only using stock price appreciation.

Then there's the blended approach. You can achieve a 10% return in less than 30 months if you are lucky enough to get some price appreciation along with dividends.

▶ If you held your stock for exactly one year, what would the stock price have to be on that day in order for you to sell the stock and achieve your 10% return?

Since you held the stock for one year, you have received 4% already by collecting the dividends. To achieve the desired 10% return, **you'd need a 6% increase in the stock price.**

1% of 50 = 0.50
6% of 50 = 6 x 0.50 = 3
50 + 3 = 53

The stock price would have to be **$53** for you to make the 6% return you want.

Using a blended approach, you collected 4% in dividends and made another 6% on stock price appreciation and thus achieved your desired 10% return in one year or four quarters.

Each of these three methods will work, and no method is better than the others. It all comes down to your patience and tolerance of risk.

Getting Started

You can start learning about stocks and dividends by getting a current stock quote. This stock quote for IBM (below) was taken from Yahoo.com's Financial tab.

To find quotes for stocks you're interested in, go to finance.yahoo.com, type the symbol for a particular stock in the box at the top left, and click Look Up.

If you don't know the company's stock symbol, type the company's name in the quote look-up box and a list of companies, with their symbols, appears.

Stock quotes provide a lot of information. We've circled two important pieces in the quote below:

▶ **Point A:** Shows the current annual dividend the stock is paying, as well as the yield at this stock price.

▶ **Point B:** Shows the 52-week range of the stock's price. When trying to determine if the current price of a stock is too high, too low or in the middle, it can be useful to know its price range. IBM is trading at about $193 per share, about 21 points above its low point for the year and 19 points below its high point.

If investing in dividend-paying stocks seems like a reasonable alternative to a bank savings account and you accept the risk involved with investing in stocks, then it is possible for you to achieve nice growth. Keeping an eye on your investments will help you enjoy long-term success.

Assessment: Dividend-Paying Stocks

1. Metro Corp. is currently selling stock at $32.50 per share with a $0.90 dividend. If you purchase 100 shares at the current price, what yield will you expect as a return on your investment?

2. Metro Corp. is currently selling stock at $32.50 per share with a $0.90 dividend. You invest $1,625 with no brokerage commissions and hold the stock for one year. How much income will you earn?

3. After the year is up, Metro Corp. is selling stock at $28 per share. You purchase the same number of shares again at the new price. What is the blended (average) yield you are now earning?

4. Metro Corp. is doing well and announces an increase in its dividend to $1.02 per share. The stock price shoots up to $34.25. What is your new annual yield?

5. How long would you need to hold a $14 stock paying a $0.56 annual dividend to achieve a 10% return?

The following table shows the life cycle of a single stock investment. Use this data to answer questions 6– 10.

Date of Transaction	Transaction Executed	Dividend on This Date
01/01/2011	Purchase 50 shares at $17.50/share	$0.30
07/08/2011	Purchase 75 shares at $15.00/share	$0.30
04/01/2012	Purchase 75 shares at $22.50/share	$0.35
06/29/2012	Sell entire holding at $24.10/share	

6. What dividend dollar amount was earned in 2011?

7. What dividend yield was earned in 2011?

8. What dividend dollar amount was earned over the life of the investment?

9. What was the dividend yield of this stock on April 1, 2012?

10. What was this investment's total return?

Dividend-Paying Stocks

Assessment Solutions: Dividend-Paying Stocks

1. Metro Corp. is currently selling stock at $32.50 per share with a $0.90 dividend. If you purchase 100 shares at the current price, what yield will you expect as a return on your investment?

    0.90/32.50 = 0.0276 = **2.8%**

2. Metro Corp. is currently selling stock at $32.50 per share with a $0.90 dividend. You invest $1,625 with no brokerage commissions and hold the stock for one year. How much income will you earn?

    1625/32.50 = 50 shares

    50 x 0.90 = **$45**

3. After the year is up, Metro Corp. is selling stock at $28 per share. You purchase the same number of shares again at the new price. What is the blended (average) yield you are now earning?

    50 shares x 28 = $1400

    1400 + 1625 = $3025

    0.90 x 100 = $90

    90/3025 = 0.0297 = **3%**

4. Metro Corp. is doing well and announces an increase in its dividend to $1.02 per share. The stock price shoots up to $34.25. What is your new annual yield?

    1.02 x 100 shares = $102

    102/3025 = 0.0337 = **3.4%**

5. How long would you need to hold a $14 stock paying a $0.56 annual dividend to achieve a 10% return?

    0.56/14 = 0.04 = 4% annual return, so 2 years = 8% and **2.5 years = 10%**

    or

    0.1 x 14 = $1.40

    1.4/0.56 = **2.5 years = 10 quarters**

Dividend-Paying Stocks

The following table shows the life cycle of a single stock investment. Use this data to answer questions 6–10.

Date of Transaction	Transaction Executed	Dividend on This Date
01/01/2011	Purchase 50 shares at $17.50/share	$0.30
07/08/2011	Purchase 75 shares at $15.00/share	$0.30
04/01/2012	Purchase 75 shares at $22.50/share	$0.35
06/29/2012	Sell entire holding at $24.10/share	

6. What dividend dollar amount was earned in 2011?

0.30 x 50 = $15

(0.30 x 75)/2 = 22.50/2 = $11.25

(July purchase received half-year dividend [2 quarters])

15 + 11.25 = **$26.25**

7. What dividend yield was earned in 2011?

Investment:

50 x 17.50 = $875

75 x 15 = $1,125

Dividends:

0.30 x 50 = $15

(0.30 x 75)/2 = 22.50/2 = $11.25

(July purchase received half-year dividend [2 quarters])

Yield:

$$\text{Yield} = \frac{(15 + 11.25)}{(875 + 1125)} = \frac{26.25}{2000} = 0.0131 = \textbf{1.3\%}$$

8. What dividend dollar amount was earned over the life of the investment?

2011: $26.25

2012: 1 quarter earned on 125 shares @ $0.30: (0.30 x 125)/4 = 37.50/4 = $9.38

1 quarter earned on 200 shares @ $0.35: (0.35 x 200)/4 = 70/4 = $17.50

2012 total: 9.38 + 17.50 = $26.88

Life of the investment: 26.25 + 26.88 = **$53.13**

Dividend-Paying Stocks

9. What was the dividend yield of this stock on April 1, 2012?

Yield = $\dfrac{0.35}{22.50}$ = 0.0155 = **1.6%**

10. What was this investment's total return?

Investment:

50 x 17.50 = $875

75 x 15 = $1,125

75 x 22.50 = $1,687.50

875 + 1125 + 1687.50 = $3,687.50 invested

Sale:

200 x 24.10 = $4,820

Earnings:

4820 - 3687.50 = $1,132.50 price appreciation

1132.50 + 53.13 = $1,185.63 price appreciation + dividends collected

1185.63/3687.50 = 0.3215 = **32.2% total return**