

Investing in Stocks

SUBMITTED BY: Nina Hoe, University of Pennsylvania

SUBJECT(S): Computation

GRADE LEVEL(S): 9, 10, 11, 12

≡ OVERVIEW:

In this lesson, students are introduced to the concept of investments in stocks through dividends. Students discuss meanings of key terms and review what they have learned about simple and compound interest rates. In small groups, students compute different yield savings accounts using simple and compounded interest and compare that to expected yields from owning stocks that pay dividends. Students then calculate the return on investments. The lesson concludes with a discussion about what factors individual investors may take into account when deciding which types of investments to make.

≡ NBEA STANDARD(S):

- Computation, I. Mathematical Foundations
- Computation, II. Number Relationships and Operations
- Computation, III. Patterns, Functions, and Algebra
- Computation, VI. Problem-Solving Applications

≡ RELATED ARTICLES:

- [“Research Strategies for New Investors”](#)
- [“Penn CIO Peter Ammon on Why ‘People Matter Immensely’ to Successful Investing”](#)
- [“Keeping Fear, Frustration and Joy Out of Your Stock Portfolio”](#)
- [“Jeremy Siegel: Why Investors Shouldn’t Panic Over Stock Market Volatility”](#)
- [“Investing with Purpose”](#)

- [“How to Own a Piece of Your Favorite Brand”](#)
- [“6 Takeaways from the GameStop Stock Market Drama”](#)

Common Core Standards:

N-Q.1. Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.

N-RN.1. Explain how the definition of the meaning of rational exponents follows from extending the properties of integer exponents to those values, allowing for a notation for radicals in terms of rational exponents.

Objectives/Purposes: Students will learn how to calculate yields from owning stocks that pay dividends and compare this to investing the same amount of money in different savings accounts. Students also calculate return on investments.

Knowledge@Wharton Articles:

[“Why Stock-price Volatility Should Never Be a Surprise, Even in the Long Run”](#)

[“A Simple Solution to Stock Market Woes: Kill the Corporate Dividend Tax”](#)

[“Stocks Revisited: Siegel and Shiller Debate”](#)

Other Resources/Materials:

Calculators

Activity:

Whole Class Discussion: (15 mins)

Have students reflect upon what they learned about saving money and savings accounts and CDs.

Remember, an **investment** is putting money into something with a generally secure, expected gain. We talked about investing money into savings accounts where you are guaranteed by the bank to get your principal back as well as a certain, predetermined amount of interest. In finance, **yield** is the amount of money brought in.

Another way to invest money is in the stock market.

1. What are stocks?/What is the stock market?

Play the Wharton Global Youth Program (WGYP) Glossary: [Stock](#)

“A stock is a share of ownership in a company. A stock usually pays dividends, which are variable payments from the company to its owners. I own a few shares of Nike stock, so when a lot of people buy Nike shoes, I’m happy, because the price of Nike stock is more likely to go up.”

2. How does investing money into the stock market differ from putting money into a savings account?
3. What is the worst-case scenario in a savings account?
4. What is the worst-case scenario in a stock investment?

Discuss the idea of **risk**. Make a line on the board to show the spectrum of risk (low to high). Ask students where they would put CDs, savings accounts, and stock purchases. Explain to students that with low risk investments, you are guaranteed to get a small return. The more higher risk investments have an increasingly higher potential for big return as well as big losses.

Play the WGYP Glossary: [Speculation](#)

“Speculation is a transaction in which you hope to make money, but you are not sure you will. The last time I went to Las Vegas, I bet \$10 that the Phillies would win the upcoming World Series. But my bet was just speculation, because I’m not guaranteed to make money.”

When an investment is made, investors calculate the **Return on Investment**, or how much money they made.

Play WGYP: [Return on Investment](#) or ROI

“Return on investment, or ROI for short, is an accounting measure of income, divided by an accounting measure of investment. If the Bluth Company net income was \$2 million, and net

assets was \$10 million, the Bluth Company's ROI would be 20 percent.”

ROI = income/investment

With a savings account, the ROI is the interest/investment.

With stocks, the ROI is the percentage change.

$$\text{Percentage Change} = \frac{B - A}{A} * 100$$

In the case of stocks, let A and B represent the closing prices of a stock, where A is before B.

5. What are some things that might affect a stock price? (**Consumer tastes, economic conditions, buyer's change in perception about the company, press, etc.**)

Think of a company, for example Nike, as mentioned in the glossary. Think about some specific things that might make Nike's stock prices go up or down. What would happen if Adidas or Reebok came out with shoes that consumers liked better? Or if there were reports that Nike had mistreated employees?

6. What other types of speculation exist besides stocks? (**Financial speculation can involve the trade (buying, holding, selling) and short-selling of stocks, bonds, commodities, currencies, collectibles, real estate, derivatives, or any valuable financial instrument to attempt to profit from fluctuations in its price irrespective of its underlying value.**)

7. Given a sum of money to invest (that you do not need right at the moment), why might some people put this money into a guaranteed savings account, and why might other people choose to speculate and buy stocks or real estate? (**It's like gambling – when speculating there is potential for making substantially more than in a savings account.**)

Another way to seek more secure returns on stocks is to invest in **stocks** that pay **dividends**. Although dividend-paying stocks are typically larger, well-established companies, there is still some amount of risk. Bankruptcy is even more of a threat these days, and dividends are not guaranteed even if a company survives.

Play the WGYG Glossary: [Dividend](#)

“Dividends are payments made by corporations to their shareholders. A dividend is a means by which a corporation shares its income with its shareholders. My grandparents used the dividends

they received from their investments in corporations to pay for their golf membership in Boca Raton.”

While stock prices themselves are not secure as bank interest rates are – some stocks pay dividends that serve a similar function as interest earned. Dividends can be paid in different time increments. Some companies pay dividends yearly, quarterly (4 times per year), or monthly and they are paid to stockholders in accordance with the number of shares that they own. For example, if you own 100 shares of a company that pays yearly dividends of \$0.25, that means that you will get paid $100 \times \$0.25 = \25 each year just for owning the stock.

An investment made in a stock that pays dividends is usually done with the intent of holding the stock for a long period of time, of course hoping that the share prices will increase, but primarily with the goal of collecting regular sums of money from dividends paid. For example, in the glossary video, Professor Jennifer Blouin at Wharton says that her grandparents “used the dividends they received from their investments in corporations to pay for their golf membership in Boca Raton.” In this case, the price of the stock in the company is not as important as the dividends that they receive on a regular basis.

8. How does receiving an annual dividend relate to compounding interest annually?

9. How is receiving quarterly dividends related to compounding quarterly?

Remember these formulas: (10 mins if students are not familiar with these)

Simple Interest

$$I = P \cdot r \cdot t$$

Where **I** is the interest earned or owed in dollars, **P** is the principal amount deposited, lent, or borrowed, **r** is the interest rate (the percent) in decimal form, and **t** is the time in years that the money is in the account, lent, or that the borrower takes to pay back the loan

The general form for **compound interest** (an **exponential growth model**) is the equation:

$$A = P\left(1 + \frac{r}{n}\right)^{nt}$$

where, **P** is the principal amount, or the original amount of money before any growth occurs, **r** is the annual nominal interest rate or the **growth rate** in decimal form, **n** is the number of times the interest is compounded per year, **t** is the number of years, and **A** is the new amount.

Formula for Interest Compounded Annually: $A = P(1+r)^t$

Formula for Interest Compounded Half Yearly: $A = P(1 + \frac{r}{2})^{2t}$

Formula for Interest Compounded Quarterly: $A = P(1 + \frac{r}{4})^{4t}$

Small Group/Pair Activity: (20 mins)

Look up the current interest rates for savings account and CDs. Split up students into small groups, and depending on the size of class, ask groups to select a few companies they are interested in tracking the progress of. Once students select a company, look up the current price of that company’s stock. Have students write down that price as well as the price 1 week ago, 1 month ago, 1 year ago, 5 years ago and 10 years ago. Make notes of any dividends paid and how often they are paid. Have students calculate the ROIs on that stock for the different time periods. Make sure to incorporate dividends. Then have student compare this to the ROIs on savings accounts and CDs for similar time periods. ***(If the class is large and/or time is tight, select the companies for students and prepare a list of relevant prices and dividends for distribution.)***

Tying It All Together:

Whole Class Discussion: (10 mins)

1. Have students report back on their findings from investing with their companies.
2. How does investing in stocks compare with savings accounts and CDs?
3. How does the length of time of stock investments compare?
4. Can you ever know exactly what is going to happen to the price of a stock?
5. What factors might contribute to the changing price of a stock?
6. If you are making a long-term investment, what factors need to be assessed?
7. Under what types of circumstances would you put money into a savings account?
8. Under what types of circumstances would you buy stocks that pay high dividends?

Extending the Activity:

Have students read the article [“Why Stock-price Volatility Should Never Be a Surprise, Even in the Long Run,”](#) specifically focusing on the first page.

In pairs, answer the following questions:

1. Why are stocks more volatile than people might think?
2. What makes stocks and their future behavior unsure?

3. What are factors that might contribute to stock volatility?

Have students report back to the class on their findings.

What Worked and What I Would Do Differently:

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