5.6 Bonds, Allocation, and Diversification

Student Activity Packet

UNIT: INTRO TO INVESTING & EXPONENTIAL FUNCTIONS

Name:

IN THIS LESSON, YOU WILL:

- Compare linear and exponential growth patterns
- Apply compound interest formula over various time periods
- Calculate percent growth
- Define bonds and learn how they produce a return on investment
- Explain the inverse relationship between bond yield and interest rates
- Learn the importance of diversification and asset allocation for spreading risk
- Explain the difference between individual bonds and bond funds

INTRO

ACTIVITY: PLAY: Roll with the Market

Now that you've learned how the market works, it's time to start investing! Follow your teacher's directions to play this market investing game. Then answer the reflection questions from the game below.

1. **Describe the range of emotions you experienced as you played the game.**

2. **How did your strategy evolve over each round? What factors influenced your strategy?**

3. **What did you learn about yourself and your tolerance for risk with this game?**

4. **This game illustrates some of the ups and downs of stock market trends. Depending on how big or little they are, it might make you nervous about putting money into the market. What kind of investment trend might make you feel better about your investment portfolio?**

LEARN IT

EDPUZZLE: Bond. Savings Bond.
When investing, it can be good to have something other than just stocks in your portfolio. This is where bonds come in. Watch this video to learn more about how bonds work and why they could be a useful choice to include in your investments. Then, follow your teacher's directions to answer the questions either within the EdPuzzle itself or on this document.
NOTE: EdPuzzle videos shuffle answer choices and do not always match the order provided in the lesson.

1. **Select the best definition of a bond.**
    a. A bond is ownership in a company.
    b. A bond is a sum of money paid regularly to its shareholders by a company.
    c. A bond is an FDIC insured investment account.
    d. A bond is a loan to the government or a company that pays investors a fixed rate of return over a specified period of time.

2. **What does the term coupon mean (when related to bonds)?**
    a. The timeframe of the bond
    b. The annual interest rate paid on a bond
    c. The face value of the bond
    d. The discounted rate of the bond when purchased

3. **Which is the highest bond rating?**
    a. AAA
    b. BBB
    c. CCC
    d. DDD

4. **Why would someone invest in a bond with a low rating?**
    a. Lower rated bonds typically have a higher coupon
    b. Lower rated bonds typically have a lower coupon
    c. Lower rated bonds are typically less expensive
    d. Lower rated bonds are typically more expensive

5. **What is a bond fund?**
    a. A bond issued by a corporation to raise funds for a variety of reasons
    b. A bond that does not pay interest but is sold at a discount
    c. A mutual fund that invests in a variety of bonds
    d. A mutual fund that mimics a particular market index

6. **True or False: Bonds have less risk than stocks, but more risk than a savings account.**
    a. True
    b. False

INFOGRAPHIC: The Bond See-Saw

Credit risk describes the risk that the borrower defaults and you lose your principal investment. The other risk factor with bonds is the fixed interest rate. Examine the second page of this article addressing interest rate risk and answer the questions.

1. **This image is referred to as the "bond see-saw." What does it show about the relationship between a bond's price and the overall interest rates of the market?**

2. **Explain in your own words why that relationship exists.**

APPLY IT

Imagine you have a bond with ten years left until maturity, a face value of $1000 and a 4% coupon rate. Interest rates recently rose to 6% and you want to figure out how it might impact the price of your bond. We will do some simple calculations, ignoring inflation, to see what might change.

1. **How much would this bond pay you back in principal at the end of the 10 years?**

2. **How much would you be paid total in interest over the next ten years of holding the bond?**

3. **What is the total value of the bond (principal + interest) if you hold it to maturity?**

4. **If you bought a new $1000, 10-year bond at today's higher 6% coupon rate, how much would that bond be worth in total, including both principal at maturity and interest along the way?**

5. **Ignoring inflation, how would you need to discount your bond for it to provide the same profit as a new one?**

LEARN IT

VIDEO: The Power of Diversification

One of the most popular investing strategies is diversification, or the spreading of risk. Watch this short video about diversifying your investments to learn more about how it works. Then, answer the questions.

1. **What is meant by "asset allocation?"**

2. **After allocating assets, what's the next level of diversifying you should do within asset classes?**

ARTICLE: Buying Bonds vs Buying Bond Funds
You know that investing in bonds can be a smart way to diversify your portfolio and reduce overall risk, but what's the difference between an individual bond and a bond fund? Read this article just through the third section on bond funds, then answer the questions below.

1. **How can bond funds help with portfolio diversification more than individual bonds?**

2. **What is one way investing in a bond fund is like investing in an individual bond?**

3. **What is one way investing in a bond fund is like investing in the stock market?**

MATH CONNECTION - Evaluating Asset Classes

We all know that putting all your investment money into one company's stock would be pretty risky. But, by choosing an entire asset class instead, would you be minimizing your risk and creating a winning strategy? Let's find out using data from Novel Investor's Asset Class Returns interactive.

Part I: Define the Asset Classes
An asset class is a grouping of investments that have similar characteristics, behave similarly in the market, and follow the same rules and regulations. Really common asset classes are stocks, bonds, and cash, but there are others as you'll see below.

Use your prior knowledge, educated guesses, or internet research to match the asset class to its proper description.

Asset Classes

1. Lg Cap: Large cap stocks
2. Sm Cap: Small cap stocks
3. Int'l Stk: International developed stocks
4. EM: Emerging market stocks
5. REIT: Real estate investment trusts
6. HG Bnd: High grade bonds
7. HY Bnd: High yield bonds
8. Cash: Cash
9. AA: Asset Allocation Portfolio

Descriptions

_____ International companies in countries with established industry, widespread infrastructure, and secure economies

_____ Bonds with lower credit ratings and a greater chance of default, often issued by startups or struggling businesses

_____ Cash or cash equivalents like Treasury bills backed by the federal government

_____ A diversified portfolio made up of 15% large cap, 15% international, 10% small cap, 10% emerging markets, 10% REITs, 40% high-grade bonds, and annual rebalancing

_____ Largest US companies, which have a market cap over $10 billion

_____ Smaller US companies, which have a market cap between $300 million and $2 billion

_____ International companies in countries with still developing capital markets and less stable economies

_____ Bonds with high credit ratings and lower risks of default, usually issued by stable companies

_____ Companies that own, operate, or finance income-generating real estate

Part II: Learn to Read the Chart

In the chart under the interactive, each Asset Class is listed next to an Index. Index funds are what enable you to own many investments in that asset class. For example:

Abbr.	Asset Class – Index	Annual	Best	Worst
Lg Cap	Large Cap Stocks – S&P 500 Index	9.88%	32.4%	-37.0%

10. **What does the "Annual" column of the chart measure?**

11. **What is the range of percent returns for this asset class? What does it mean when the range is very large?**

12. **What will always be true of how the annualized return compares to the "Best" and "Worst" year returns?**

Part III: Dig Deeper on Asset Classes

Now that you've got the lay of the land, let's use this chart to determine whether diversifying into an index fund representing an asset class is enough.

Abbr.	Asset Class – Index	Annual	Best	Worst
Lg Cap	Large Cap Stocks – S&P 500 Index	9.88%	32.4%	-37.0%
Sm Cap	Small Cap Stocks – Russell 2000 Index	8.91%	38.8%	-33.8%
Int'l Stk	International Developed Stocks – MSCI EAFE Index	4.97%	32.5%	-43.1%
EM	EM Stocks – MSCI Emerging Markets Index	6.95%	79.0%	-53.2%
REIT	REITs – FTSE NAREIT All Equity Index	7.15%	35.1%	-37.7%
HG Bnd	High Grade Bonds – Bloomberg Barclays U.S. Agg Index	4.40%	8.7%	-2.0%
HY Bnd	High Yield Bonds – ICE BofA US High Yield Index	7.44%	57.5%	-26.4%
Cash	Cash – S&P U.S. Treasury Bill 0-3 Mth Index	1.11%	4.7%	0.0%
AA	Asset Allocation Portfolio*	7.02%	24.6%	-22.4%

Source

11. **Let's look at cash first. It never has a negative year. Does that make Cash Equivalents a good investment? Why or why not?**

12. **Use the annualized rate of return as the interest rate in the compound interest formula, Value = $P(1+i)^t$, to calculate the expected returns on $1000 of principal invested in each of these different asset class indices over this 15 year period.**

Asset Type	Annualized Rate of Return	15-Year Returns
Lg Cap: Large cap stocks		
Sm Cap: Small cap stocks		
Int'l Stk: International developed stocks		
EM: Emerging market stocks		
REIT: Real estate investment trusts		

HG Bnd: High grade bonds		
HY Bnd: High yield bonds		
Cash: S&P U.S. Treas. Bill 0-3mo Index		
AA: Asset Allocation Portfolio		

13. **What is the range in 15-year returns on the $1000 investment for these asset types?**

14. **Now look just at Lg Cap, HG Bnd, and AA and complete this chart for a 30-year and 40-year time horizon.**

Asset Type	Avg. Annual Return	30-Year Returns	40-Year Returns
Lg Cap: Large cap stocks			
AA: Asset Allocation Portfolio			
HG Bnd: High grade bonds			

15. **What is the range in 40-year returns on the $1000 investment for these three asset types?**

16. **Do you personally think investing in an asset class is enough to minimize risk and create a winning strategy? Justify your answer.**

17. **If you look at the * that defines the Asset Allocation Portfolio, you'll see it's a weighted blend of many of the other asset classes. Using the chart, would you rather invest in the Asset Allocation Portfolio or one of the other index funds listed? Explain your answer.**

EXIT TICKET

Follow your teacher’s instructions to complete the Exit Ticket.

Teachers, you can find exit ticket questions on the Lesson Guide.