

Lesson 6

Save and Invest: Bonds—Lending Your Money

Lesson Description

This lesson introduces bonds as an investment option. Using a series of classroom visuals, students will identify the three main parts of a bond and describe why a bond might sell at a price different from its stated price. After learning the formulas for market price and bond yield, students will complete a case study about a fictional company.

National Standards in K–12 Personal Finance Education (www.jumpstart.org)

Saving and Investing

Standard 2: Explain how investing builds wealth and helps meet financial goals.

Standard 3: Evaluate investment alternatives.

Instructional Objectives

Students will:

- Explain the purpose of a public or private bond.
- Define face value, coupon rate and maturity date.
- Distinguish between bond yield (or rate of return) and the bond's coupon rate.
- Analyze factors that influence a bond's yield and market price.

Time Required

One to two 50-minute class periods

Materials Required

- Class set of *Building Wealth*
- Copies of the following classroom visuals
 - *Visual 1: World War II Bonds*
 - *Visual 2: Parts of a Bond*
 - *Visual 3: The Coupon Rate*
 - *Visual 4: Yield on a Bond*
 - *Visual 5: Relationship Between Price and Current Yield*
 - *Visual 6: Shopping For the Best Yield: Buying & Selling Bonds*
 - *Visual 7: The Big Picture*
 - *Visual 8: Buy, Sell or Hold*
 - *Visual 9: Market Price*
 - *Visual 10: Yields, Coupon Payment and Market Prices*
- Copies of the following handouts for each student
 - *Handout 1: Case Study – Franklin Kite Company*
 - *Handout 2: What's Your Bond Knowledge?*

Procedure

1. Ask students to read the section called **Bonds—Lending Your Money** in the *Building Wealth* booklet on pages 12–14.
2. Display *Visual 1: World War II Bonds*. Use the following questions to introduce bonds and explain their function as debt instruments or IOUs for public and private entities.
 - Does the U.S. government ever spend more than it receives in tax revenue?
Yes, since 2002, the U.S. has run a deficit (expenditures are greater than revenues).
 - How does the government spend more than it receives?
It borrows money by selling bonds.
 - Can other entities sell or issue bonds?
State or local governments as well as private businesses issue bonds.
Note: Teacher may wish to point out to the students that the last time the U.S. issued war bonds was World War II. They were issued not only to help finance the war but also to help fight inflation. With full employment and rationing, war bonds were a means of removing money from circulation, thus helping fight inflationary pressures.
3. Display *Visual 2: Parts of a Bond*. Identify the parts of a bond using information from the visual. Discuss the features of bonds using the following information:
 - Bonds are a written promise by the borrower to repay the amount borrowed plus interest (IOU).
 - The three main parts of a bond are:
 - Face value (or par value) – the amount being borrowed
 - Maturity date – the date when the principal of the bond is repaid
 - Coupon rate – the rate of interest paid to the bond holder
 - A person who buys a bond becomes a lender and assumes the risk that the bond seller might not repay the debt. Nonpayment is called default.
 - The riskiness of bonds varies widely. U.S. Treasury bonds are traditionally considered to be the safest of all bonds.
4. Display *Visual 3: The Coupon Rate*. Use the information on the visual to discuss the coupon rate. Tell students that interest on this type of bond is computed by multiplying the coupon rate and the face value of the bond. This annual or semiannual interest payment is a significant benefit of bond ownership. Ask students about this specific bond.
 - What is the face value (par value) of this bond?
\$1,000
 - What is the coupon rate of this bond?
5%
 - What will the coupon payment be on this bond?
\$50 (5% x \$1,000)
5. Display *Visual 4: Yield on a Bond*. Tell students that we all like a good deal, and bond investors are no different.
 - Ask students what investors are looking for when they buy bonds. Emphasize that bond holders look for a good rate of return.

- Explain to the students that
 - A bond's rate of return is called its yield.
 - There are two kinds of yields: coupon yield and current yield
- Read the definition of coupon yield and reference Visual 2 or 3 for the coupon yield.
 - Ask students what the coupon yield is. *5%*
 - Ask students if the coupon yield will ever change. *No*
- Read the definition of current yield on Visual 4. Emphasize:
 - To understand current yield, we must remember that bonds can be bought and sold. If you buy a bond, you do not necessarily have to hold it to maturity. You can sell it.
 - Since people can buy and sell bonds like they buy and sell other goods, the price of the bond will fluctuate.
- Point out the formula that can be used to calculate the yield.

$$\frac{\text{Coupon payment}}{\text{bond price}} = \text{yield}$$

- Ask students what will happen to the yield when the price of the bond changes? Remind students that the coupon yield and coupon payment are fixed. They do not change. Students should respond that the current yield will change.
- Emphasize once again the difference between the coupon yield and the current yield. The current yield changes as the market price changes. The coupon yield is fixed: It is the same as the coupon rate.

6. Display *Visual 5: Relationship Between Price and Current Yield*.

- Point out to students that the relationship of yield to price can be summarized as follows:
 - When price goes up, yield goes down.
 - When price goes down, yield goes up.
 - Technically, the bond's price and its yield are inversely related.
- Point out the illustrations in the visual emphasizing that sellers drive down the price, thus increasing the yield; and buyers drive up the price, thus decreasing the yield.
- Review the three components of the equation: current yield, coupon payment and bond's price.
- Check for student understanding by asking student to compute the coupon payment and the yield on a bond with a face value (par) of \$1,000 and coupon rate of 3%.
 - What is the coupon payment? *\$30*
 - What is the current yield if the market price of the bond is \$800?
3.75% (\$30 ÷ \$800 = 3.75%)
 - What is the current yield if the market price of the bond is \$1,200?
2.5% (\$30 ÷ \$1,200 = 2.5%)

7. Display *Visual 6A: Shopping for the Best Yield: Buying and Selling Bonds*. Review the bullet points.

Display *Visual 6B*.

- Go over the first What If scenario in Visual 6B: Investor holds a bond with a 5% yield and new bonds are issued with an 8% yield.
 - Is the old bond as desirable as the new? *No*

- What is the investor who owns the old bond inclined to do? *Sell the old and buy the new.*
 - What happens to the price of the old bond? *It goes down.*
 - What happens to the old bond's yield? *It goes up.*
- Go over the second What If scenario: Investor owns a bond that yields 8%. New bonds issued have a 5% yield.
- Is the old bond as desirable as the new? *Yes, more desirable.*
 - What is the investor who owns the old bond inclined to do?
Hold the bond since it has a higher yield than the newly issued bond.
 - What happens to the price of the old bond?
Since its yield is greater than the newly issued bond, investors will tend to buy it, thus driving up the price.
 - What happens to the old bond's yield? *It goes down.*

8. Display *Visual 7: The Big Picture*. Review the concepts of coupon rate and payment, market price and current yield.
9. Display *Visual 8: Buy, Sell or Hold*. Ask students to decide if they would buy, sell or hold a bond paying a 5% coupon rate if similar investments in the market offered the coupon rates listed on the table. Given the decision to buy, sell or hold, what do they anticipate will happen to the price of the bond? Use the information below for reference.

Current Yields for Similar Bonds	Stated Coupon Rate	Buy, Sell or Hold?	Will the price rise, fall or stay the same?
8%	5%	Sell	Fall
5%	5%	Hold	Stay the same
10%	5%	Sell	Fall
1%	5%	Buy	Rise

10. Display *Visual 9: Market Price*. Discuss the information and the formula with students.
11. Display *Visual 10: Yields, Coupon Payment and Market Prices*. Ask the students to work in pairs to compute the market prices in their notes. Review the correct answers using the information below.

Current Yields for Similar Bonds	Stated Coupon Rate and Payment	Formula	What should the market price be?
8%	5% and \$50	$\$50 \div .08$	\$625
5%	5% and \$50	$\$50 \div .05$	\$1,000
10%	5% and \$50	$\$50 \div .10$	\$500
1%	5% and \$50	$\$50 \div .01$	\$5,000

12. Distribute *Handout 1: Case Study – Franklin Kite Company*. Have students work in pairs to complete the information. Use the suggested answers to discuss student responses.

Closure

13. Review the major concepts of the lesson using the following questions:

- What is a bond and what are the three parts of the bond?

A bond is a way for a business or the government to raise money. It is basically an IOU. The three parts of a bond are the face value (par value), the coupon rate and the maturity term.

- What is the difference between the yield and the coupon rate?

The yield is a rate of return based on the market value of the bond; the coupon rate is the rate of return based on the stated, par value of the bond.

- What impact does a change in interest rates on similar investments have on the yield of a bond?

An increase in interest rates on similar investments will lower the yield of the bond; a decrease in interest rates on similar investments will increase the yield of the bond.

- What effect does a change in market rates have on the coupon rate of a bond?

The coupon rate is unaffected by market interest rates.

- What impact does a change in interest rates on similar investments have on the price of the bond?

Since the coupon rate can't change, the market price of the bond must change to bring its yield in line with market rates. A fall in interest rates relative to a bond's coupon rate will drive up the price of the bond. The increase in the price of the bond drives down the yield of the bond. An increase in interest rates relative to a bond's coupon rate will drive down the price of the bond and thus increase the yield of the bond. The yield and price of the bond move in opposite directions.

Assessment

14. Distribute *Handout 2: What's Your Bond Knowledge?* Have students complete the assessment independently.

Optional Extension

Have students research historic war bond posters using the Archival Research Catalog that is found on the National Archives website at <http://www.archives.gov/research/arc/>. Numerous digital copies of historic war bond posters can be viewed online. Have students create a new poster advertising bonds in a similar style. The poster should include a picture and a slogan as well as reasons why buying bonds is a good investment.

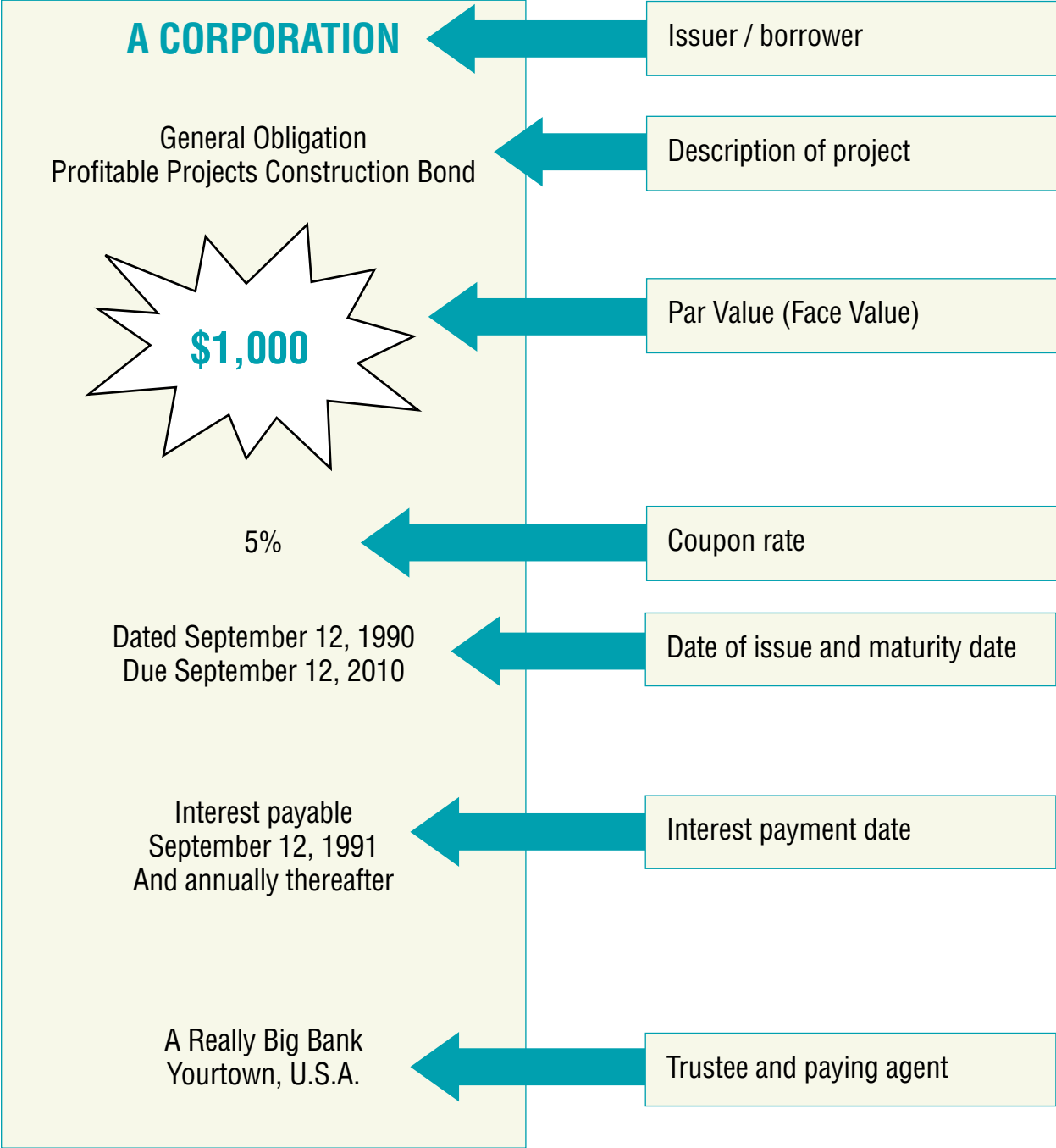
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Visual 1: World War II Bonds



Source: www.archives.gov/research/arc/

Visual 2: Parts of a Bond



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Visual 3: The Coupon Rate

Coupon bonds have a stated coupon rate. The owner of the bond is entitled to a regular interest payment based on the coupon rate and the face (or par) value of the bond.


For this bond, the coupon rate of return is 5%, and coupon payment is \$50 per year.

Coupon payment = Face (Par) value × Coupon rate

$$\$50 = \$1,000 \times 5\%$$

A CORPORATION

General Obligation
Profitable Projects Construction Bond



\$1,000

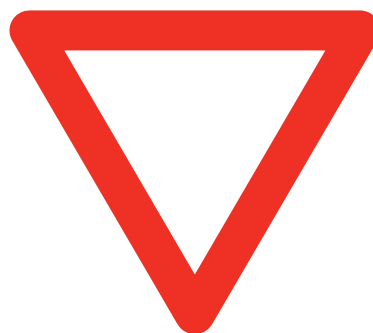
5%

Dated September 12, 1990
Due September 12, 2010

Interest payable
September 12, 1991
And annually thereafter

A Really Big Bank
Yourtown, U.S.A.

Visual 4: Yield on a Bond



What Is a Bond's Yield? Its Rate of Return

Two Kinds of Yields

- **Coupon Yield** is the interest rate established when the bond is issued. It is the same as the coupon rate. It does not change.
- **Current Yield** is the interest rate of return that the bond provides at the present price. The current yield is calculated by dividing the coupon payment by the current price of the bond.

Let's look at the formula

$$\text{Current Yield} = \frac{\text{Coupon Payment}}{\text{Bond's Price}}$$

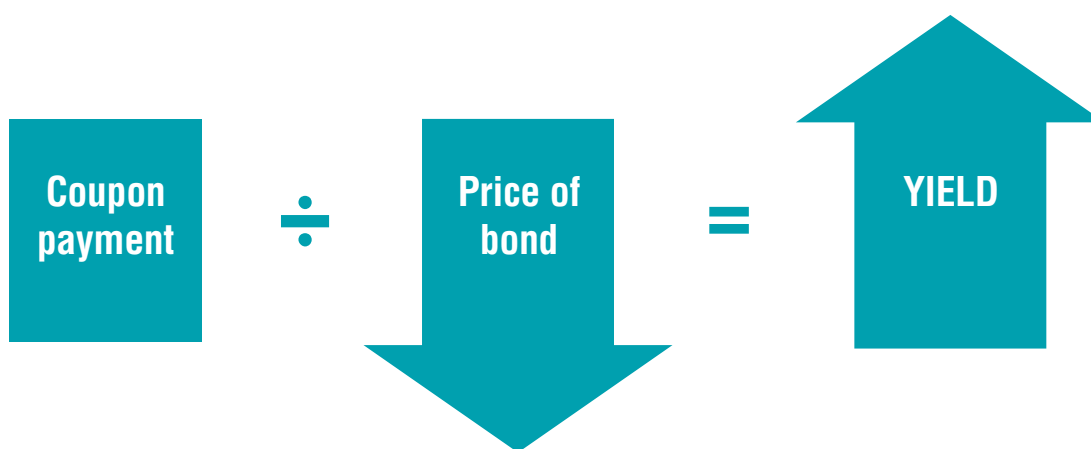
- As bonds are bought and sold, their prices change.
- The coupon payment is fixed.
- Therefore, the current yield will change as the price changes.

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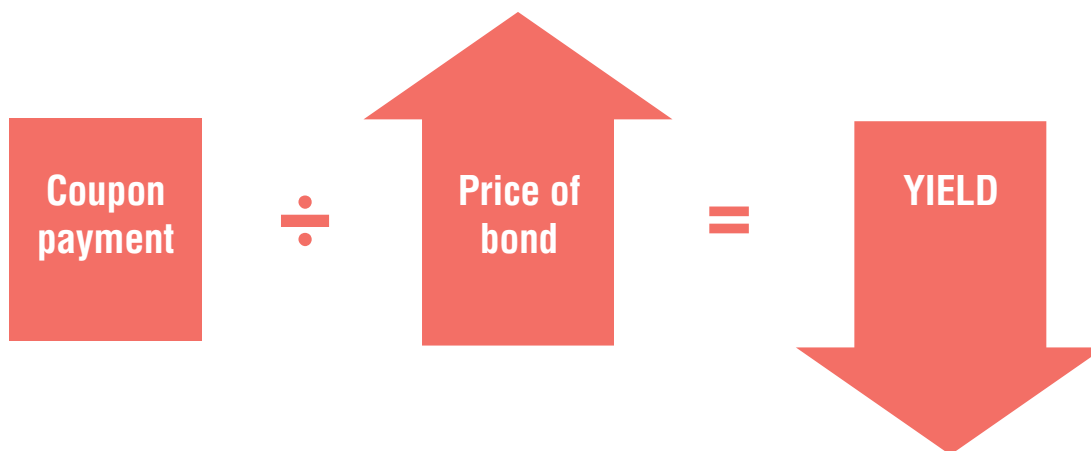
Visual 5: Relationship Between Price and Current Yield

- Price Goes Down ↓ Yield Goes Up ↑ (**Sellers** drive **down** bond prices)
- Price Goes Up ↑ Yield Goes Down ↓ (**Buyers** drive **up** bond prices)

Sellers drive down bond prices. If bond sells for less than its face value, the current yield goes up.

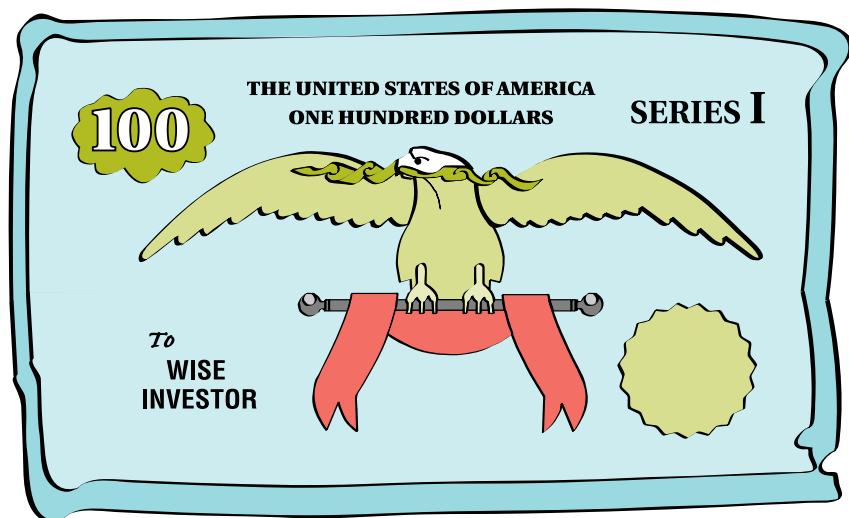


If bond sells for more than its face value, the current yield goes down.



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Visual 6A: Shopping for the Best Yield: Buying and Selling Bonds

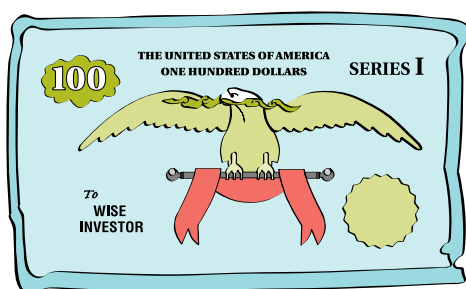


Do I buy or sell?

- People often buy and sell bonds in search of the best yield.
- Investors want a yield that is at least as good as other investments with similar risk characteristics.
- Buyers drive up the price and thus drive down the yield.
- Sellers drive down the price and thus drive up the yield.

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Visual 6B: Shopping for the Best Yield: Buying and Selling Bonds



What if?

An investor owns a bond that has a 5% rate of return, but new bonds being issued that are otherwise similar offer a coupon rate of 8%? What is most likely to happen?

- Is the old bond as desirable as the new?
- What is the investor who owns the old bond with a 5% rate of return inclined to do?
- What happens to the price of the old bond?
- What happens to the old bond's yield?

What if?

An investor owns a bond that has an 8% rate of return (current yield). New bonds issued have a 5% coupon rate. What is most likely to happen?

- Is the old bond as desirable as the new?
- What is the investor who owns a bond with an 8% rate of return inclined to do?
- What happens to the price of the old bond?
- What happens to the old bond's yield?

Visual 7: The Big Picture

I get it! Investors want to get the best rate of return possible.

If a bond promises a yield lower than others in the market, investors will **SELL** that bond. The price will fall and the yield will rise.

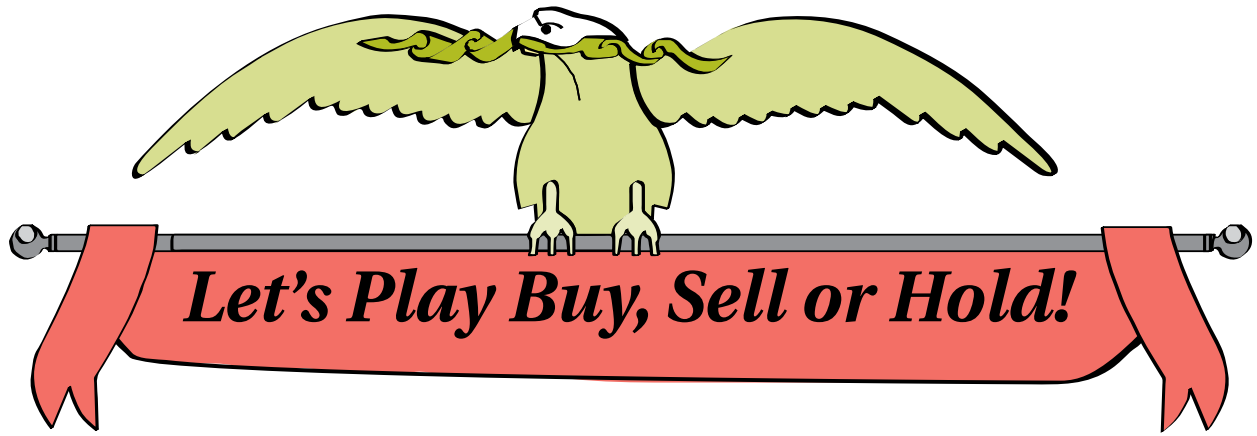
If a bond promises a yield higher than the others in the market, investors will **BUY** that bond. The price will rise and the yield will fall.

Since the coupon payment is fixed, the market price changes to adjust the yield.



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Visual 8: Buy, Sell or Hold



Current Yields for Similar Bonds	Stated Coupon Rate	Buy, Sell or Hold?	Will the price rise, fall or stay the same?
8%	5%		
5%	5%		
10%	5%		
1%	5%		

Visual 9: Market Price



Think about the formula to calculate yield:

$$\text{Coupon payment} \div \text{Price} = \text{Yield}$$

If we know the yield, how can we calculate the price?

$$\text{Coupon payment} \div \text{Yield} = \text{Price}$$

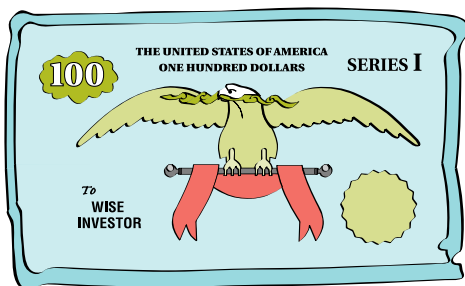
Think about the bond that had a coupon payment of \$50. Other similar bonds have a yield of 7%. This bond should sell for \$714.29.

$$\$50 \div 7\% = \$714.29$$

Remember that dividing by 7% is the same as dividing by .07.

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Visual 10: Yields, Coupon Payment and Market Prices



Current Yields for Similar Bonds	Stated Coupon Rate and Payment	Formula	What should the market price be?
8%	5% and \$50	$\$50 \div .08$	
5%	5% and \$50		
10%	5% and \$50		
1%	5% and \$50		

Name: _____ Date: _____

Lesson 6 – Save and Invest: Bonds—Lending Your Money

Handout 1: Case Study: Franklin Kite Company

Franklin Kite Company, a kite manufacturer in Philadelphia, Pa., needs \$10,000 to retool its assembly line to produce the next generation of the “electric kite.”

As a finance officer with the company, you have decided to raise the entire \$10,000 by selling 10 bonds with a face value of \$1,000 each. You decide to offer an annual coupon rate on the bonds of 6%.

You have been asked to explain the bond program to the board of directors in Philadelphia. Answer these questions to prepare for your presentation.

Franklin Kite Company



General Obligation
Construction Bond

6%

Dated January 1, 2005

Due January 1, 2010

Interest Payable
January 1, 2006, and annually thereafter

National Bank - Anytown, U.S.A.

1. Identify the following features of each of the 10 bonds:

Length of maturity _____

Face value (or par value) _____

Coupon rate _____

2. What will be the amount of annual interest payment on each bond? _____

3. What is the total interest payment for Franklin Kite Company each year for ALL 10 bonds? _____

4. If the potential buyers for Franklin Kite Co. bonds are concerned about the future of the company, these bonds might be considered risky. How could the company make the bonds more attractive to buyers?

5. If similar bonds are issued with a coupon rate of 8%, will the price of Franklin Kite Company bonds rise or fall? _____

6. If similar bonds are issued with a coupon rate of 2%, will the price of Franklin Kite Company bonds rise or fall? _____

7. Calculate the market price of Franklin Kite Company bonds if similar bonds have the following yields:

Other Bonds' Yield	Coupon Payment	Market Price
8%	\$60	
5%	\$60	
2%	\$60	

8. What is the relationship between the price of a bond and the rate of return on the bond? _____

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Handout 1: Case Study: Franklin Kite Company

Suggested Answers

1. Identify the following features of each of the 10 bonds:

Length of maturity *5 years*
Face value (or par value) *\$1,000*
Coupon rate *6%*

2. What will be the amount of annual interest payment on each bond? *\$60*

3. What is the total interest payment for Franklin Kite Company each year for ALL 10 bonds? *\$600*

4. If the potential buyers for Franklin Kite Co. bonds are concerned about the future of the company, these bonds might be considered risky. How could the company make the bonds more attractive to buyers?

Offer a higher coupon rate

5. If similar bonds are issued with a coupon rate of 8%, will the value of Franklin Kite Company bonds rise or fall? *Fall*

6. If similar bonds are issued with a coupon rate of 2%, will the value of Franklin Kite Company bonds rise or fall? *Rise*

7. Calculate the market price of Franklin Kite Company bonds if similar bonds have the following yields:

Other Bonds' Yield	Coupon Payment	Market Price
8%	\$60	\$750
5%	\$60	\$1,200
2%	\$60	\$3,000

8. What is the relationship between the price of a bond and the rate of return on the bond?

As one rises, the other falls. As one falls, the other rises.

Name: _____ Date: _____

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Handout 2: What’s Your Bond Knowledge?

Matching

Match the following terms using definitions from the lesson and *Building Wealth*.

- | | |
|---|---|
| 1. ___ Bond | A. Nominal, or face, value of a bond |
| 2. ___ Treasury note | B. Debt obligation issued by private or public entity |
| 3. ___ Par value | C. Treasury bond or note that is tied to inflation so that the principal amount of the investment increases or decreases according to the annual inflation rate |
| 4. ___ Premium | D. Calculated as coupon payment ÷ market price of the bond |
| 5. ___ Yield (Current) | E. Interest rate stated on a bond expressed as a percentage of the par (face) value |
| 6. ___ Treasury bond | F. Short-term investment issued by the U.S. government for one year or less |
| 7. ___ Treasury bill | G. Bond is sold for a price higher than its face value |
| 8. ___ Discount | H. Bond is sold for a price lower than its face value |
| 9. ___ U.S. savings bond | I. Nontransferable registered bond issued by the U.S. government in denominations of \$50 to \$10,000 |
| 10. ___ Treasury Inflation-Protected Security | J. Government security with a term of more than 10 years; interest is paid semiannually |
| 11. ___ Coupon rate | K. Government security with a maturity that can range from two to 10 years; interest is paid every six months |

Name: _____ Date: _____

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Handout 2: What’s Your Bond Knowledge?

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You own a bond that has a coupon rate of 6%. Now, similar bonds are being sold with the following coupon rates. Has the value of your bond gone up, down or stayed the same?

12.	2%	
13.	4%	
14.	6%	
15.	8%	
16.	10%	

17. What is the coupon rate of a \$1,000 bond that pays a \$60 coupon payment?

18. What is the coupon payment of a \$1,000 bond with a 4% coupon rate?

19. What is the yield of a \$900 bond with a \$40 coupon payment?

20. What is the market price of a \$1,000 bond with a 5% coupon when the yield on similar investments is 3%?

21. What is the market price of a \$1,000 bond with a 5% coupon when the yield on similar investments is 8%?

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Handout 2: What's Your Bond Knowledge?

Answers

1. B
2. K
3. A
4. G
5. D
6. J
7. F
8. H
9. I
10. C
11. E
12. Increased
13. Increased
14. Stayed the same
15. Decreased
16. Decreased
17. 6%
18. \$40
19. 4.4%
20. \$1,667
21. \$625